Understanding the factors shaping the implementation of the National Oral Health Policy through a workforce lens: a realist and health systems approach

A dissertation submitted to Trinity College Dublin, the University of Dublin for the

Degree of Doctor of Philosophy

Dr Paul Gerard Leavy, BDS, MSc (Dent Sci), MDPH, MFDS RCSEd, AssocFCGDent, FPFA

Centre for Health Policy and Management

School of Medicine

Trinity College Dublin, the University of Dublin

2026

Supervisors

Professor Sara Burke

Professor Blánaid Daly

Dr John Ford

Declaration and Statement of Plagiarism

I declare that this thesis has not been submitted as an exercise for a degree at this or any other university and it is entirely my own work. I agree to deposit this thesis in the University's open access institutional repository or allow the Library to do so on my behalf, subject to Irish Copyright Legislation and Trinity College Library conditions of use and acknowledgement. I consent to the examiner retaining a copy of the thesis beyond the examining period, should they so wish (EU GDPR May 2018).

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Dr Paul Leavy, BDS, MSc (Dent Sci), MDPH, MFDS RCS (Edin), Assoc.FCGDent, FPFA

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Dedication

This thesis is dedicated to my parents, Maura and Donal and to my fiancé, Grant.

To my parents, you have always championed me in my educational endeavours, providing encouragement and support from an early age. Two weeks into my PhD, back in 2021, my family's world was turned on its head by an accident which has left my father in a care home. The last four years have therefore not been easy for me, my siblings or my parents, especially my mother. In spite of this, she has continued to champion me, doing so on her, and my dad's behalf.

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Glossary of terms

Context: any condition (for example, setting, circumstance or structure) that triggers, modifies or impedes a mechanism to generate outcomes of interest (Duddy & Roberts, 2022).

Mechanism: an underlying, hidden and pre-existing process which is activated or triggered in a given context to generate outcomes of interest. Mechanisms are ordinarily descriptions of the reasoning, tendencies, and behaviours of agents and their responses to context(s) (Duddy & Roberts, 2022).

Outcome: resulting action, impact or change when a mechanism is triggered or activated in a given context (G Wong et al., 2013).

Context-mechanism-outcome configuration (CMOC): a narrative and/or diagrammatic description which provides a theoretical explanation for the causal relationship between contexts, mechanisms and outcomes. CMOCs are used to create realist programme theory (Duddy & Roberts, 2022).

Programme theory: A narrative and/or diagrammatic representation of realist theory. It outlines how and intervention is expected to work, or the process by which a phenomenon of interest is believed to come about. Realist programme theory is expressed as the relationships context(s), mechanism(s) and outcome(s) (CMOCs) or multiple CMOCs (Duddy & Roberts, 2022; G Wong et al., 2013).

Realist approach: a theory-driven methodological approach used in realist studies to explain generative causation in complex subject areas where empirical testing is precluded (Geoff Wong et al., 2013).

Relevance: a determination of whether data (study, article, other grey literature) is relevant to the research question and can contribute to theory building and/or testing (Wong et al., 2014).

Rigour: a determination of whether the methods utilised to generate a study finding or particular piece of data is credible and trustworthy (Wong et al., 2014).

List of Abbreviations

(D)GA	(Dental) General Anaesthetic
(OHR)QoL	(Oral Health Related) Quality of Life
AAAQ	Availability, Accessibility, Acceptability, Quality
ADC	Advancing Dental Care
ADG	Association of Dental Groups
CBDE	Community Based Dental Education
CDoH	Commercial Determinants of Health
CDS	Community Dental Service
CDT	Clinical Dental Technician
CHIP	Children Health Insurance Programme
CHPM	Centre for Health Policy and Management
CMO(C)	Context-Mechanism-Outcome (Configuration)
CPD	Continuing Professional Development
CR	Critical Realism
CSO	Central Statistics Office
CWF	Community Water Fluoridation
D&M	Dublin and Midlands
DALY	Disability Adjusted Life Year
DCP	Dental Care Professional
DCR	Dental Contract Reform
DDUH	Dublin Dental University Hospital
DFT	Dental Foundation Training
DHAP	Dental Health Action Plan
DHP	Dental Healthcare Professional
DHSC	Department of Health and Social Care (UK)
DMFT	Decayed/Missing/Filled Teeth
DoH	Department of Health
DSP	Department of Social Protection
DTBS	Dental Treatment Benefit Scheme
DTSS	Dental Treatment Services Scheme
DVT	Dental Vocational Training
EOHC	Essential Oral Healthcare
ESRI	Economic and Social Research Institute

EU	European Union
FACCT	Fluoride and Caring for Children's Teeth
FFS	Fee For Service
FGD	Focus Group Discussion
FPT	Final Programme Theory
G(M)P	General (Medical) Practitioner
GBD	Global Burden of Disease
GDP	General Dental Practitioner
GDS	General Dental Services
GMB	Group Model Building
GMS	General Medical Services
GNP	Gross National Product
GOHAP	Global Oral Health Action Plan
HEE	Health Education England
HI	Healthy Ireland
HiT	Health systems in Transition
HRH	Human Resources for Health
HSA	Health Systems Analysis
HSE	Health Service Executive
HSS	Health Systems Strengthening
ID(S)	Intellectual Disability (Supplement)
IDA	Irish Dental Association
IHA	Integrated Healthcare Area
IMF	International Monetary Fund
IPC	Infection Prevention and Control
IPT	Initial Programme Theory
LHO	Local Health Office
MID	Minimally Invasive Dentistry
NAO	National Audit Office
NCD	Non-Communicable Diseases
NDIP	National Dental Inspection Programme
NHS	National Health Service
NI	National Insurance
NOHP	National Oral Health Policy

OECD	Organisation for Economic Co-operation and Development
OHS	Oral Healthcare Services
OHSRC	Oral Health Services Research Centre
OOP	Out of Pocket Payments
PAG	Project Advisory Group
PCRS	Primary Care Reimbursement Service
PDS	Public Dental Service
PHI	Private Health Insurance
PHS	Public Health Scotland
PI	Principal Investigator
PIL	Participant Information Leaflet
POCC	Public Only Consultant Contract
PPE	Personal Protective Equipment
ppm	Parts per million
PRSI	Pay Related Social Insurance
QA	Quality Assurance
RAMESES	Realist And Meta-narrative Evidence Syntheses: Evolving Standards
RCSI	Royal College of Surgeons in Ireland
RCT	Randomised Controlled Clinical Trial/Root Canal Treatment
READ	Ready-Extract-Analyse-Distil
REAMS	Research Ethics Application Management System
RWP	Robust Workforce Planning
SDA	Secondary Data Analysis
SDG	Sustainable Development Goal
SoP	Scopes of Practice
SPHeRE	Structured Population health, Policy and Health-services Research Education
SSDT	Sugar Sweetened Drinks Tax
SSN	Servizio Sanitario Nazionale
TCD	Trinity College Dublin
TILDA	The Irish Longitudinal Study on Ageing
U(O)HC	Universal (Oral) Health Coverage
UCC	University College Cork
UDA	Unit of Dental Activity
UK	United Kingdom

UN	United Nations
US(A)	United States (of America)
W&NW	West and Northwest
WHA	World Health Assembly
WHO	World Health Organization
WTE	Whole Time Equivalent

Summary of PhD

Policy problem and rationale for research

Recent years have witnessed a decline in the number of private general dental practitioners (GDPs) providing publicly funded primary oral healthcare for low-income adults as contractors on behalf of the Irish health system. This has resulted in restricted access to care for vulnerable populations. Against this backdrop, the Irish Government seeks to implement *Smile agus Sláinte* – National Oral Health Policy (2019) which aims to widen access to publicly funded care through greater use of GDP contractors. The current workforce and capacity challenges in primary oral healthcare are not unique to Ireland or dentistry and are symptomatic of wider health system problems. In the context of policy and change implementation, understanding complex system drivers and how they influence the capacity of the system to deliver services can help bridge a policy implementation gap. There is an absence of primary research investigating this topic in Ireland and wider research focussing on factors influencing dentists' engagement in state-funded care from a health systems perspective. The aim of this PhD thesis therefore is to understand what are the health system factors that influence private GDPs participation in state-funded, contracted primary oral healthcare and therefore the implementation of workforce changes proposed as part of oral healthcare system reforms in *Smile agus Sláinte* – National Oral Health Policy.

Methods

Across three sequential studies, this PhD thesis addresses the research aim from different perspectives. The first study is a documentary and secondary data analysis, the second study is a realist review, and the third study is a realist interview study. Data were collected via searches of publicly available oral healthcare datasets, systematic and non-systematic literature searching, and via qualitative realist interviews respectively. Documentary and secondary data analysis methods and realist analytical approaches were adopted.

Results

This PhD thesis demonstrates a steady decline in the number of private GDP-contractors providing state-funded primary oral healthcare for low-income adults in Ireland while the eligible population has increased, widening the gap between service demand and capacity. The three studies highlight important health systems contextual factors which influence GDPs participation and engagement in publicly funded, contracted care. In Ireland and elsewhere, oral health garners limited political and health systems priority, influencing the design, funding and resourcing of services. Oral healthcare systems, including Ireland's, continue to focus on costly, dentist-led restorative care

models rather than prevention. This can lead to care rationing and cost containment within state dental contracts. Contract restrictions which limit clinician autonomy, alongside perceived low remuneration and burdensome administration can drive dentists towards the private sector. Background economic conditions and societal care preferences can also influence the wider oral healthcare 'market' dynamics. Suboptimal or adversarial communication and engagement between health systems and dentists can also lead to loss of trust, deepen professional isolation among GDPs' and further fuel their dissatisfaction with state-financed oral healthcare. Messaging from within GDPs' professional networks can reinforce dissatisfaction and further encourage the shift towards the private sector.

Conclusion

Private GDPs' engagement in publicly funded primary oral healthcare is influenced by a myriad of complex and inter-related health systems factors. As Ireland looks to implement *Smile agus Sláinte* and meet its international obligations commensurate with the WHO Global oral health action plan, the findings of this thesis provide health system leaders with evidence to leverage system change that could potentially increase or sustain GDPs' engagement in state-contracted care. Leveraging such change and increasing GDPs' engagement in publicly funded primary oral healthcare has the potential to improve access to care for vulnerable populations and reduce oral health inequalities.

List of outputs

The research conducted as part of this PhD has produced two publications (studies one and two), one journal article (study three) in peer review along with various conference presentations and other contributions outlined below, along with research visibility:

Peer reviewed publications

Paul Leavy, Pádraic Fleming, Blánaid Daly, Sarah Barry, Sara Burke. Primary oral healthcare in Ireland: a health systems analysis of publicly funded contracted services delivered by the general dental practitioner workforce. *BMC Health Services Research*, (2025) 25:802, https://doi.org/10.1186/s12913-025-12884-6

Paul Leavy, Sophie Mulcahy Symmons, David Mockler, Pádraic Fleming, Blánaid Daly, John Ford, Sara Burke. How and why do health system factors influence general dentists' participation in publicly funded, contracted primary dental care services: A realist review. *Health Policy*, Vol 153, 2025, https://doi.org/10.1016/j.healthpol.2025.105248

In peer review

Paul Leavy, Blánaid Daly, John Ford, Sara Burke. 'Us and them': a realist interview study exploring how and why health system factors influence dentists' participation in state funded, contracted primary dental care for low-income populations in Ireland (submitted for peer review).

Other publications completed under auspices of SPHeRE PhD programme

Paul Leavy and Blánaid Daly. Educational outcomes associated with undergraduate dental education in primary care and community settings in Europe: findings from a rapid scoping review. *European Journal of Dental Education*, (2025). DOI: 10.1111/eje.70004

Co-author:

Mulcahy Symmons S, Leavy P, Heavey L, Mason Mohan C, Drury A, De Brún A. How is equity captured for colorectal, breast and cervical cancer incidence and screening in the Republic of Ireland: A review. *Preventive Medicine Reports*. 2023 Sep 17;36:102405. doi: 10.1016/j.pmedr.2023.102405.

Conference awards:

Highly commended, Postgraduate Research Presentation Award 2025 for oral presentation of: "How and why do health system factors influence general dentists' participation in publicly funded, contracted primary dental care services: a realist review." Irish Division International Association

for Dental, Oral and Craniofacial Research (IADR) Annual Scientific Meeting, Barcelona, Spain, 26 June 2025.

Runner up, BASCD - Borrow Foundation Early Career Poster Award 2023, for poster: "'Outcomes of community based undergraduate dental education in Europe: a scoping review". British Association for the Study of Community Dentistry (BASCD) summer meeting, University College Cork (UCC), Cork, Ireland, 16 June 2023.

Conference and lecture presentations

Paul Leavy, Sophie Mulcahy Symmons, David Mockler, Pádraic Fleming, Blánaid Daly, John Ford, Sara Burke. "Factors Influencing General Dentists' Participation In State-Funded, Contracted Care"; International Association for Dental, Oral and Craniofacial Research (IADR) Pan European Region General Session & Exhibition, Barcelona, Spain; Format: Poster. Oral Presentation delivered at Irish Division IADR Annual Scientific Meeting (Paul Leavy), Barcelona, Spain; 26 June 2025

Paul Leavy. "How and why do health system factors influence general dentists' participation in publicly funded, contracted primary dental care services: a realist review"; SPHeRE Network 11th Annual Conference, RCSI, Dublin, Ireland; Format: Oral Presentation; 4 March 2025

Paul Leavy. "Understanding the Factors Shaping the Implementation of Ireland's National Oral Health Policy through a Workforce Lens"; DPH 475 - Dental Public Health Lectures and Seminars, UCSF School of Dentistry, San Francisco, California, USA; Format: Lecture; 2 April 2024

Paul Leavy, Pádraic Fleming, Blánaid Daly, Sarah Barry, Sara Burke. "Primary oral healthcare in Ireland: a health systems analysis of publicly funded contracted services delivered by the general dental practitioner workforce"; SPHeRE Network 10th Annual Conference, RCSI, Dublin, Ireland; Format: Poster; 29 February 2024

Paul Leavy and Blanaid Daly. "Outcomes of community based dental education in Europe: a scoping review"; British Association for the Study of Community Dentistry (BASCD) summer meeting, University College Cork, Ireland; Format: Poster; 16 June 2023.

PhD research visibility

DrBicuspid.com news article by Ava Barros, "Why dentists don't participate in state health programs", 27 January 2025. Source: https://www.drbicuspid.com/dental-practice/office-management/insurance/article/15712694/why-dentists-dont-participate-in-state-health-programs

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Chapter 1 Introduction

1.1 Chapter outline

In this chapter I will introduce this PhD research which aims to explain and understand the health system factors that influence private general dental practitioners (GDPs) participation in publicly funded, contracted primary oral healthcare services in Ireland. This research is framed against the implementation of *Smile agus Sláinte* (the name in the Irish language meaning '*Smile and Health*') – Ireland's National Oral Health Policy (NOHP). This was published in 2019 and seeks to reorientate primary oral healthcare services in Ireland with greater provision of state-funded care by private GDP-contractors being a key component of system reforms (Department of Health, 2019). This PhD comprises three sequential studies which seek to establish the extent of, and explore private GDPs' engagement in state funded, contracted primary oral healthcare in Ireland and how health system factors influence such engagement. The background to the thesis and its three studies is described below and sets the stage for subsequent chapters. It explores and defines key concepts under investigation namely: oral health, oral health policy, oral healthcare systems and workforce.

The research outlined in this thesis is focussed on the state funded, contracted primary oral healthcare system in Ireland. This introduction therefore encompasses an overview of the oral healthcare system in Ireland, workforce and service delivery models and the oral health policy context in Ireland.

The three studies undertaken as part of this PhD and their aims and objectives will also be introduced in detail and the rationale behind the decision to apply a health systems lens to this research. I will also discuss my own positionality in relation to the research. The chapter concludes with an outline of the thesis.

This PhD thesis is a health systems analysis. It comprises the following three studies:

1. A documentary and secondary data analysis which paints a picture of the current primary oral health system in Ireland and highlights trends in the GDP workforce, specifically related to state-funded, contracted primary oral healthcare. It quantifies and therefore frames the broader problem under investigation in this thesis, i.e., the declining number of private GDPs engaged in state-funded care for low income adult populations;
2. A realist review of the international literature which produces programme theory explaining how and why health system factors influence GDPs participation in state-funded, contracted care and;

3. A realist interview study which builds on study two and uses data collected via interviews with frontline practitioners, health system elites and academic subject experts to explain how, why, for whom and in what circumstances do health system factors influence private GDPs' engagement in state-funded, contracted oral healthcare for low-income adults in Ireland. It therefore provides explanatory theory for the findings in study one.

1.2 Background to the thesis

Oral diseases, including dental caries, periodontal disease and oral cancer while largely preventable, are some of the world's most prevalent non communicable diseases (NCDs) (Watt, Daly, et al., 2019). These conditions can cause pain, infection, loss of function and disfigurement, impacting people across the life course (Peres et al., 2019; World Health Organization, 2025c). They therefore present a significant health burden in many jurisdictions, including low-, middle- and high-income nations (Peres et al., 2019). As the global population continues to grow and individuals retain their own natural dentition into older age, this disease burden is likely to persist in the absence of any meaningful action on oral health (Bernabe et al., 2025). According to the World Health Organization (WHO) it is estimated that up to half the global population are affected by oral diseases to some extent (World Health Organization, 2025c). Optimal oral health is regarded as a fundamental human right and is intrinsically linked to overall general systemic health and well-being (Watt, Daly, et al., 2019; World Health Organization, 2024).

On the burden of oral diseases, dental caries is one such condition which continues to impact populations across all countries and socio-economic gradients (Fraihat et al., 2019). According to the Global Burden of Disease (GBD) 2021, untreated caries in permanent (adult) teeth is the most common health condition (Institute for Health Metrics and Evaluation, 2025). It is also the most common preventable disease affecting children (McAuliffe et al., 2025). Despite decades of robust evidence demonstrating the effectiveness of preventative interventions in improving oral health outcomes, namely those involving fluoride, the prevalence of caries and other oral conditions continues to increase globally owing to changes in living conditions and increasing urbanisation (Iheozor-Ejiofor et al., 2024; Walsh et al., 2019; World Health Organization, 2025c). The widespread availability (and affordability) of foodstuffs and beverages containing high quantities of free sugars, coupled with suboptimal exposure to fluorides (for example, in municipal water supplies and oral hygiene products like toothpaste) and lack of access to routine oral healthcare services are the main drivers of this increased prevalence (World Health Organization, 2025c) . Regarding the commercial determinants of health (CDoH), marketing is understood be a powerful force in promoting the consumption of products that can contribute to poor oral health and other

NCDs including sugar, alcohol and tobacco (Kearns & Watt, 2019) Furthermore, trans- and multi-national corporations and industries such as the sugar industry are understood to be powerful agents in lobbying and influencing both health research and policy (Gilmore et al., 2023; Kearns et al., 2015; Watt, Daly, et al., 2019). Dental caries also presents a major economic burden as it remains one of the costliest NCDs to manage (Vujicic & Listl, 2020).

Untreated oral diseases, including dental caries disproportionately impact lower socio-economic, vulnerable and marginalised population groups (including children) and are therefore associated with significant health inequalities (Peres et al., 2019). Notably, these inequalities can be borne out in impeded access to routine and affordable oral healthcare including primary care dental services (Watt, Venturelli, et al., 2019). While these 'downstream' services are deemed essential for the provision of diagnostic, preventative, early and advanced intervention care (and therefore upholding good oral health), they are costly and ordinarily do not form part of national universal health coverage (UHC) benefit packages (Jevdjevic & Listl, 2025; Winkelmann et al., 2023). This, according to the WHO, can make access to timely and affordable oral healthcare *'unattainable for millions of people',* including vulnerable and marginalised populations (World Health Organization, 2020). The high costs associated with 'out-of-pocket' private oral healthcare can act as a barrier to care access among the most disadvantaged individuals and families, leading not only to poorer oral health outcomes, but an increased risk of financial hardship (World Health Organization Regional Office for Europe, 2023). More broadly, downstream oral health interventions have not proved to be successful in significantly reducing population oral health inequalities (Dawson et al., 2022). Furthermore, the unequal distribution of dentists and other oral healthcare professionals can further impede timely access to primary oral healthcare services and deepen inequalities further (Winkelmann, Gómez Rossi, et al., 2022).

Recognising these challenges, the WHO and leaders in dental public health have called on UN member states to reform oral healthcare systems globally by embedding oral health within UHC and NCD agendas (Fisher et al., 2018; Peres et al., 2019; Watt, Daly, et al., 2019) At the 74th World Health Assembly (WHA) in 2021, WHO member states adopted resolution WHA74.5 on oral health (World Health Organization, 2021). This resolution advocates reorientating oral health systems away from the traditional 'curative' paradigm to a prevention-focussed approach where comprehensive oral healthcare interventions are included within national UHC benefit packages and delivered within primary care systems. The landmark WHA resolution acted as the springboard for the WHO Global oral health strategy and action plan (GOHAP) 2023-2030 (World Health Organization, 2024). As part of system reforms and in order achieve UHC for oral health, sufficient workforce capacity will be required to ensure the availability and accessibility of services

and patients have timely access to care (World Health Organization, 2024). As a key component of oral healthcare systems, primary care dentists are, and will likely remain, central to the delivery of routine and advanced oral healthcare services for the foreseeable future. In many European health systems primary care dentists are GDPs who operate privately and receive public income for services provided on behalf of the state (Winkelmann, Gómez Rossi, et al., 2022).

The Republic of Ireland ('Ireland') is an example of a country which currently has restricted oral health coverage for the whole population. Limited or very limited baskets of publicly funded primary oral healthcare are available to some children, low income or vulnerable adults and publicly insured adults via three separate publicly funded services. Briefly, these are the salaried Oral Healthcare Service (OHS) operated directly by Ireland's publicly-funded national health service – the Health Service Executive (HSE), the HSE Dental Treatment Services Scheme (DTSS) and Dental Treatment Benefit Scheme (DTBS) which is administered by the Irish government's Department of Social Protection (DSP) (Woods et al., 2017). The OHS primarily serves children under the age of 16 while the latter two schemes serve adult populations and are delivered by private GDP-contractors. The DTSS serves low income and vulnerable adults holding a 'medical card' (approximately 25% of the population) while the DTBS serves adults who have paid sufficient social insurance contributions on their income.

The current system is, however, highly fragmented and sees large swathes of the population go without access to timely or affordable primary oral healthcare, namely very young children, people with disabilities, and older people (Department of Health, 2019). Recognising these system shortcomings, *Smile agus Sláinte*, Ireland's National Oral Health Policy (2019) seeks to reform oral healthcare services in Ireland to better serve population needs (Department of Health, 2019). While the policy predates the 2021 WHO resolution, its objectives are in broad alignment with WHO goals on oral health, namely *"to provide the supports to enable every individual to achieve their personal best oral health"*. The policy seeks to reduce oral health inequalities in Ireland by ensuring that individuals have access to appropriate and adaptable oral healthcare services across the life course and by providing additional supports to vulnerable populations to access care and improve their oral health. As part of system reforms, the policy proposes contracting a greater proportion of publicly funded primary oral healthcare to private GDPs to deliver care on behalf of the state. However, in recent years, the Irish oral healthcare system has found itself in the midst of a workforce capacity and access crisis driven by declining numbers of private GDPs participating in existing state-funded, contracted primary oral healthcare for low-income adult populations (McAuliffe et al., 2022; O'Neill, 2022). This has led to impeded access to routine primary oral healthcare for many of the most disadvantaged in Irish society (Houses of the Oireachtas, 2024a).

These workforce and access crises are not however unique to Ireland or to oral healthcare. Other health systems which utilise models of third party, contracted primary oral healthcare are also experiencing workforce and access challenges, for example the National Health Service (NHS) across the United Kingdom (UK) (Deborah Evans et al., 2023).

Workforce problems in healthcare, including recruitment and retention, span all specialities and settings and are often described as complex and 'wicked' (Barriball et al., 2015; Johnson & Ahluwalia, 2025). According to Rittel and Webber, 'wicked' problems are those which are difficult or impossible to solve due to their complex, multi-component nature and interconnections with other problems (Rittel & Webber, 1973). Health systems are open, complex systems and workforce challenges in healthcare are understood to be highly sensitive to and therefore symptomatic of wider health system problems, not necessarily a cause *per se* (Endalamaw et al., 2024; Figueroa et al., 2019). Across Europe, most health systems are faced with the challenge of balancing the optimal number of healthcare workers (HCWs) *'with the right skills in the right areas'* to meet population health needs and amid reducing workforce numbers, for example due to retirement or attrition (Barriball et al., 2015). Globally, the WHO estimates a shortfall of some 11 million HCWs by 2030 (World Health Organization, 2022b).

The success of *Smile agus Sláinte* and the realisation of its goals will be highly dependent on private GDPs' willingness to engage voluntarily in reformed services, however at the present time there is somewhat of a mismatch between policy intent and the frontline profession as demonstrated by their declining participation in state-contracted care for low-income groups. In the context of existing workforce and patient access challenges, the aspirations and need for system reform congruent with *Smile agus Sláinte and* the WHO GOHAP, understanding complex health system drivers and how they influence the capacity of the system to deliver primary oral healthcare services will be key in helping to bridge or possibly avoid a policy implementation gap. For this reason, this PhD research takes a health systems approach in seeking to understand this complex topic by investigating the health system factors influencing private GDPs' engagement in publicly funded, contracted primary oral healthcare, primarily in Ireland.

In the upcoming sections, I will detail the following: oral health, oral health policy, oral healthcare systems and oral healthcare workforce. Under each of these sections, I will discuss how these relate to the global and Irish contexts.

1.3 Oral health

The WHO describes oral health as encompassing not just the *'state of the mouth, teeth, and orofacial structures'*, but the psycho-social dimensions such as *'self-confidence, well-being and*

the ability to socialise and work without pain, discomfort and embarrassment' (World Health Organization, 2024). Diseases and conditions of the mouth are among the world's most prevalent NCDs and include dental caries (decay), periodontal (gum) diseases, non-carious tooth surface loss (tooth wear), oral cancer, tooth loss and dento-alveolar trauma (Bernabe et al., 2020; Petersen et al., 2005). Most oral diseases are entirely preventable, yet they continue to afflict almost half the global population with 3.7 billion people having some form of oral disease in 2025 (Bernabe et al., 2025). Their global prevalence is higher than for any other NCD (World Health Organization, 2022a). Oral diseases do not discriminate between the young, middle-aged or elderly, impacting individuals across the life course. As such, these conditions and their sequelae can result in diminished oral health related quality of life (OHRQoL) and lead to reduced educational attainment, employment productivity and earning potential due to lost days of school, college or work (Righolt et al., 2018; Watt et al., 2018). Oral diseases therefore have the potential to negatively impact on individuals, families, communities and wider society (Peres et al., 2019). The financial and economic burden of oral diseases can also present significant challenges not only to individuals and families, but health systems (Righolt et al., 2018; World Health Organization Regional Office for Europe, 2023). As well as impacting negatively on people's health and quality of life, oral health conditions are regarded as among the most expensive NCDs with an estimated cumulative global cost of US$710bn in 2019 (Jevdjevic & Listl, 2025). Of this, US$387bn was attributable to direct costs while the remaining US$323bn was apportioned to loss of productivity for five main conditions: caries (deciduous and permanent teeth), periodontal disease, tooth loss and other oral diseases (Jevdjevic & Listl, 2025). Notably, the requirement to deliver treatment under general anaesthetic (GA), namely extraction of multiple carious teeth in children can place additional financial and resource pressures on already stretched health systems (McAuliffe et al., 2017; Peres et al., 2019). Dental general anaesthetic (DGA) is frequently reported as one of the main reasons for hospital admission among children in high income countries and the primary reason in the UK (Kaddour et al., 2023; Rogers et al., 2018)

Although they impact all population groups, oral diseases disproportionately affect vulnerable and marginalised populations (Peres et al., 2019). These include lower socio-economic groups, minorities and people with disabilities (Peres et al., 2019). These inequalities in oral health have been shown to persist throughout the life course and appear to be widening in some jurisdictions (Petersen & Kwan, 2011). According to Public Health Scotland (PHS), the 2022/23 National Dental Inspection Programme (NDIP) found that while there was an overall reduction in the average number of teeth with obvious caries in 11–12-year-olds (from 2005) inequalities persist. Among assessed children from the most deprived quintile 72% had no obvious caries compared to 88% of

children living in the least deprived quintile. In England, a comprehensive assessment of oral health inequalities published in 2021 found that vulnerable populations including looked after children, people experiencing homelessness and the Travelling community had significantly poorer oral health than other groups (Public Health England, 2021). While that report does recognise limitations within the available data and a lack of evidence to fully comprehend oral health inequalities in England, it reports that these populations face substantial challenges in accessing dental care. It cites lack of availability of NHS dental services and associated costs as barriers to care.

1.3.1 Prevention and management of oral diseases

The 16th century Dutch philosopher Desiderius Erasmus is credited for coining the well-known and often cited proverb *"Prevention is better than cure."* He also wrote the satirical essay, *"In Praise of Folly"* in which he criticises the foolishness and corrupt practices of the Christian church and wider society at the time. Five centuries on, the sentiments underlying Erasmus' works can be applied in how oral diseases, namely dental caries, are managed across health systems globally. The aetiology of many of the world's most prevalent oral diseases can ultimately be traced to sugar, tobacco and alcohol. As such, there is a wide body of evidence underpinning preventative modalities in oral healthcare namely oral health education and instruction, application of topical fluorides, pit and fissure sealants, smoking cessation advice and community water fluoridation (CWF). On prevention, the evidence is unequivocal that public health interventions tackling common risk factors can lessen the burden of oral diseases and other NCDs.

Traditional 'biomedical' approaches to disease prevention in dentistry have focussed on altering patients' lifestyles and behaviours through education and instruction, for example on diet or toothbrushing techniques. While important at the 'downstream' health intervention level, these approaches often fail to tackle the underlying social, environmental, political, commercial and other determinants of disease, nor do they account for the complexities of patient behaviours (Watt, 2005). Furthermore, these interventions are often developed and delivered in isolation to other general health promotion initiatives and therefore do not capitalise on addressing the overlapping common risk factors shared with other NCDs, for example type 2 diabetes (the 'common risk factor' approach) (Sheiham & Watt, 2000). Similarly, while 'high risk' approaches to oral health promotion and disease prevention targeting 'at risk' groups can be effective in improving oral health outcomes, these also do not tackle the underlying determinants of disease and therefore tend to be reactive and palliative in nature (Burt, 2005; Watt, 2005). Recognising the limitations inherent in these approaches, the focus is shifting to developing 'upstream' dental public health interventions which tackle the underlying determinants of disease at population

level. Alongside mid- and downstream interventions, these strategies can better enable individuals, families and communities to avoid disease through the creation of environments which support optimal health. Essential to the creation of these supportive environments are appropriate health and social policies, legislation, regulation, organised health systems and community action. Examples of such upstream public health interventions are Ireland's workplace ban on smoking introduced in 2004 and sugar sweetened drinks tax (SSDT) in 2018 (Allwright, 2004; Houghton et al., 2023).

Like the biomedical approach to prevention, oral healthcare treatment modalities continue to adopt a curative or interventionalist paradigm ('drilling and filling') which predominates across health systems globally (Watt, Daly, et al., 2019). This predominance and focus on highly technical and specialised care is understood to be an impediment to routine and timely oral healthcare access due to high treatment costs which may be prohibitive for many (World Health Organization, 2024). Furthermore, this paradigm also runs counter to an emerging philosophy within dentistry (certainly academic dentistry) which centres on arrest of primary disease, remineralisation and preservation of tooth structure through modification of risk factors, exposure to fluoride and cost effective, minimally invasive dentistry (MID) and atraumatic treatment approaches ('sealing and healing') (Harding & O'Dowling Keane, 2024; Watt, Daly, et al., 2019). It has been suggested that routine preventative and minimally invasive care delivered in primary care settings may be at the mercy or sacrifice of more 'advanced' and technically demanding interventionalist treatments, thus further driving inequalities and poorer oral health outcomes, especially among the most disadvantaged and vulnerable (World Health Organization, 2024). Coupled with these phenomena is the widespread absence of oral healthcare within publicly funded UHC benefit packages across the globe.

While it is well established that timely and equitable access to preventative and routine oral healthcare is fundamental in improving oral health, especially among children and other vulnerable groups, governments have been slow to implement policies that enable health system reform and enhance access to publicly funded routine oral healthcare (Crall & Vujicic, 2020; Watt, Daly, et al., 2019) Recognising this *'folly'*, and the need to reorient oral healthcare systems towards *'prevention'* rather than *'cure',* the WHO, dental public health community and others have repeatedly called on member states to develop and implement policies and strategies that not only address the wider determinants and risk factors of oral diseases, but which promote *"access and affordability to essential oral healthcare services"* by integrating oral health promotion and oral healthcare into primary healthcare and UHC packages.

1.3.2 Oral health in Ireland

Ireland is an island nation and European Union (EU) member state located in north-western Europe. In 2024, the estimated population was approximately 5.3 million, an increase of almost 400,000 since 2020 (Central Statistics Office, 2024d). Owing to natural increase and net inward migration, Ireland's population is projected to increase by between 500,000 and 1.8 million by 2057 (Central Statistics Office, 2024c). Ireland's population is an ageing one, with the proportion of over 45s increasing from 35.5% in 2013 to 40.6% in 2023 (Central Statistics Office, 2024b).

Ireland's most recent nationally representative oral health surveys were conducted over 20 years ago. The national survey of adult oral health was conducted between 2000 and 2002 and the national survey of children's oral health between 2001and 2002 (Whelton et al., 2006; Whelton et al., 2007). Surveys were coordinated by the Oral Health Services Research Centre (OHSRC) in University College Cork (UCC). The child oral health survey found that among 5-year-olds, the mean number of visibly cavitated decayed, missing or filled primary teeth (d_{3vc}mft) was 1.3 in areas with community water fluoridation (CWF) compared to 2.3 in non-CWF areas (Whelton et al., 2006). In 15-year-olds, the same figures for adult teeth (D_{3vc}MFT) were 2.6 and 3.8 respectively. The survey concluded that the percentage of 5-year-old children with carious primary teeth was 37% in CWF areas and compared to 55% in non-fluoridated areas. The same percentages for 15-year-olds were 73% in CWF areas and 79% in non-CWF areas. For adults, the mean D_{3c}MFT for 16- to 24-year-olds in 2000/2002 was 4.9, while for 35- to 44-year-olds, the mean score was 15.0 (Whelton et al., 2007). For the over 65s population, the mean D_{3c}MFT score was 25.9. Similar to children, differences were observed between fluoridated and non-fluoridated status, for example, the mean D_{3c}MFT score among 16-24s in non-CWF areas was 5.2 compared to 4.6 in fluoridated areas. The adult survey also found medical card holders had higher rates of periodontal disease and tooth loss compared to non-medical card holders.

In the absence of more recent nationally representative epidemiological data, there have been several studies conducted in the past decade which shed some light on the current state of Ireland's oral health. Most notable among these is the Fluoride and Caring for Children's Teeth (FACCT) study examining dental caries and fluorosis experience in Ireland following a downward revision in CWF concentration levels from 0.8–1.0 to 0.6–0.8 ppm in 2007 (James et al., 2018). The study compared a random sample of 8-year-olds in Dublin, Cork and Kerry and found primary teeth dentinal caries (d_{3vc}mft(cde)) prevalence was 55% in Dublin (full CWF) and 56% in Cork-Kerry (full CWF) with a mean d_{3vc}mft(cde) of 3.4 and 3.7 respectively. In non-fluoridated areas of rural Cork-Kerry, the prevalence was 65% with a mean d_{3vc}mft(cde) of 4.2 among children with caries (James et al., 2021).

For adults, 'wave 3' of The Irish Longitudinal Study on Ageing (TILDA) assessed the dental health of a subset of community dwelling participants aged 50 and over between March 2014 and December 2015 (Naseer et al., 2022). Among adults over 50, the mean DMFT was 18.5 while for those aged 65 years and over, this was 20.1, a decrease of 5.8 from the 2000/2002 national adult survey (Naseer et al., 2022). Regarding periodontal health, the TILDA study found that while there was a significant reduction in the number of adults with deep periodontal pockets (on 2000/2002 levels), there was an increase in the proportion of adults with calculus and shallow periodontal pockets, owing to increased tooth retention. Reflecting this trend, the study also found 16% of over 65s were edentulous compared to 41% in the 2000/2002 national survey. Among adults with an intellectual disability (ID), analysis of data from 'wave 1' of the Intellectual Disability Supplement to The Irish Longitudinal Study of Ageing (IDS-TILDA) found over a third of people aged 50 and over with an ID in Ireland were edentate (Mac Giolla Phadraig et al., 2015). Complete edentulism was associated with increasing age and residency status with a greater proportion of those living in residential facilities being edentate (40%) versus those living independently or at home (29%) (Mac Giolla Phadraig et al., 2015).

1.4 Oral health policy

1.4.1 WHO global oral health action plan (GOHAP)

Acknowledging the global burden of oral health diseases, member states agreed to adopt the WHO resolution on oral health at the 74th World Health Assembly (WHA) in 2021 (World Health Organization, 2022c). This landmark resolution advocates moving from the traditional interventionalist approach to oral healthcare outlined above, to one focussed on oral health promotion and disease prevention. Cognisant of the longstanding political, health systems and policy neglect of oral health, it asks member states to embed oral health within NCD agendas and include oral healthcare interventions within national UHC benefit packages. Oral health's 'neglect' is itself complex, believed to arise from its omission from general healthcare systems and a failure to consider oral health as an integral aspect of any healthcare system reform (Watt, Daly, et al., 2019). Perpetuating this is the low political interest and salience in oral health (and oral healthcare), an inability to fully appreciate the impact of oral diseases on populations and perceptions that oral health is a personal responsibility (Benzian et al., 2011).

The momentum generated by the historic WHA resolution has acted as the springboard for a series of key high level policy documents designed to inform and define the global oral health agenda to 2030, namely the 'Global oral health status report: towards universal health coverage for oral health by 2030', the 'Global strategy on oral health' (WHA75 (11), 2022) and the 'Global oral health

action plan' ('GOHAP') 2023–2030 (WHA76 (9), 2023). The GOHAP reaffirms the need for health systems globally to adopt a public health approach to tackling oral health inequalities and advocates for the integration of oral health into mainstream primary healthcare services as part of efforts to prioritise universal accessibility. The overall vision of the GOHAP is the development of UHC for oral health by 2030 where 80% of the worldwide population has access to essential oral healthcare. According to the WHO, UHC *'means that all people have access to the full range of quality health services they need, when and where they need them, without financial hardship. It covers the full continuum of essential health services, from health promotion to prevention, treatment, rehabilitation, and palliative care across the life course'* (World Health Organisation, 2023c). Regarding UHC for oral health or universal oral health coverage (UOHC), the GOHAP asks member states to establish cost effective and evidence based essential oral healthcare (EOHC) packages to be delivered as part of national UHC benefits. It suggests EOHC packages should comprise *'emergency care, prevention and treatment of common oral diseases and conditions and essential rehabilitation'* with prevention and MID prioritised. The WHO emphasises the need for these packages to be delivered within primary care settings, ensuring there is equitable access to care for vulnerable populations, including children.

In Europe and elsewhere, some jurisdictions have already achieved partial or comprehensive UOHC, most notably targeting children and other vulnerable population groups (Winkelmann, Gómez Rossi, et al., 2022). For example, Denmark, the UK, Brazil and Thailand all offer comprehensive or semi-comprehensive UOHC covering paediatric and/or wider populations (Galvão et al., 2021; Sitthisettapong et al., 2021; Winkelmann, Gómez Rossi, et al., 2022). Conversely, health systems such as Ireland's, Australia's and the United States of America offer only partial or targeted oral healthcare models where substantial gaps in population coverage persist. In Europe, there remains, widespread variability in levels of statutory dental care cover for wider population groups with an estimated two thirds of care funded by out of pocket payments or voluntary private health insurance in Europe (Winkelmann, Gómez Rossi, et al., 2022).

The WHO GOHAP has six strategic objectives. These relate to oral health governance, leadership and improved political and resource commitment to oral health (objective one); oral health promotion and oral disease prevention (objective two); integration of essential oral health care within primary care (objective four); oral health information and surveillance systems (objective five); and the oral health research agenda (objective six). On the oral health workforce, objective three asks member states to develop innovative workforce models to ensure *"the availability of skilled health workers in adequate numbers to ensure the delivery of an essential package of oral*

health care". Specifically, proposed action point 46 asks member states to *"Increase [workforce] capacity to deliver oral health services as part of UHC and expand coverage of essential oral health care by planning for the availability, accessibility, acceptability and quality of skilled health workers able to deliver an essential package of oral health care for all, including for poor, vulnerable and/or marginalized populations".* It advocates for optimal and sustained investment in the oral health workforce ensuring it is aligned with current and projected population oral health needs.

1.4.2 Oral health policy in Ireland

Ireland's current state-funded oral healthcare system (described in section 1.5.3.2 below and detailed further in chapter 3) was informed by the *Dental Health Action Plan (DHAP)* (Department of Health, 1994a). Published by the Department of Health in 1994, the DHAP was informed by data captured in the 1980s and its aim was to reduce caries incidence and widen access to publicly-funded primary dental care for children and medical card holders, thus reducing oral health inequities (Kennedy, 2018). The DHAP evolved from the *'Shaping a Healthier Future: a strategy for effective healthcare in the 1990's'* health policy document and represented the first *'clear statement on the aims and health objectives of the dental services in Irish history'* by then incumbent Fianna Fáil/Labour coalition government (Department of Health, 1994b). The current iteration of HSE-funded primary oral healthcare services, namely the salaried HSE OHS and the DTSS emerged as a result. Buoyed by political interest and availability of funding at the time, implementation of the DHAP made great progress in the 1990s and early 2000s with expansion of public schemes, however shortcomings in OHS' service remit became evident, most notably the exclusion of preschool children from school screening services (Gelbier, 2002). The period from 2001 to 2007 saw a shift in policy commencing with the publication of the *'Quality & Fairness, A Health System for You'* health strategy (Department of Health, 2001). This policy placed renewed emphasis on primary care and set the scene for the abolition of regional health boards and establishment of a unified national body with a more consistent approach to healthcare planning, governance and delivery, what would become the unified HSE in 2005 (Wiley, 2005).

In 2010, the Irish oral healthcare system was subject to deep spending cuts which resulted in patient entitlements to state-funded primary dental care being stripped back as part of the Irish government's austerity response to the economic crash of 2008 (Woods et al., 2017). A major criticism levelled at the HSE and government at the time was the unilateral and swift nature of the cuts and lack of consultation with the profession or patients (Houses of the Oireachtas, 2021). As entitlements were reduced, there was a sharp increase in unmet dental needs, most notably among those from poorer socioeconomic backgrounds and growing disquiet among the dental profession who saw their incomes from state schemes plummet (Johnston et al., 2020). A series

of reports commissioned during the same period painted the Irish oral healthcare system, in particular the OHS, in a dim light. Most notable of these was the 2013 National Oral Health Forum report by Professor Jimmy Steele which painted a picture of a dysfunctional, fragmented system lacking in clear direction or effective leadership (Steele & Hackett, 2014). The report advocated for a system overhaul with a renewed focus on primary care, securing oral health from early age and clearer lines of accountability and leadership. The findings of the Irish 'Steele Report' echoed earlier reports, for example a 2002 report commissioned by the Department of Health which decried the oral healthcare system for gaps in population coverage, namely for very young children not covered by the OHS' targeted school screening programme (Gelbier, 2002).

1.4.3 Smile *agus Sláinte* - National Oral Health Policy (2019)

A new National Oral Health Policy (NOHP) for Ireland entitled *'Smile agus Sláinte'* was published in April 2019 having originally been scheduled for publication in 2008. Recognising the limitations of the DHAP and current system shortcomings, *Smile agus Sláinte* sets out a vision for reform of oral healthcare and improved oral health outcomes in Ireland (Department of Health, 2019).

Smile agus Sláinte echoes many of the sentiments of the 2017 cross-party political consensus plan, *'Sláintecare'* ('Healthcare') Report which sets out a ten-year plan to deliver major system-wide reform including the achievement of a single tier UHC system in Ireland where people can access care solely based on *"need, rather than ability to pay"* (Houses of the Oireachtas, 2017). *Sláintecare* was formally adopted by the Irish government in 2018 and its endorsement of it is evident in the 2025 Programme for Government and *'Sláintecare 2025+'* plan (Government of Ireland, 2025a, 2025b). Implementation has, to date, been slow however some progress has been made, for example, on expanding access to free GP care, abolishing in-patient public hospital charges and uptake of new 'public only' consultant contracts (POCCs) to the tune of 60% among hospital consultants (Government of Ireland, 2025a).

Smile agus Sláinte 's overarching aim is to support individuals to achieve their best oral health and ultimately reduce population oral health inequalities. Crucially, *Smile agus Sláinte* espouses a primary care, preventative and *'life course approach'* to oral healthcare with a reformed scheme for low income adults holding a medical card and expanded access to care for all children. The policy proposes an overhaul of paediatric primary oral healthcare wherein all children will be entitled to receive publicly-funded 'packages' of care delivered at regular intervals by private GDP contractors rather than salaried HSE OHS dental teams (Department of Health, 2019). This builds on a recommendation that UHC for oral health be made available to under 6s as set out in the *'First 5'* whole of Government policy on improving the health of young children (Government of Ireland,

2018). For children aged 0 to 16, eight oral healthcare 'packages' will be available from local private GDPs. Care covered by these packages will include examinations, prevention, restorations, urgent care and referrals. These packages will be available approximately every 2 to 3 years, aligning with four relevant age bands: 0-2; 2-6; 6-12 and 12-16 years. It is anticipated that GDPs will be remunerated per package with each package regarded as a single 'bundle' of care to be provided over one or several appointments as required. The dental practice in which individual care packages are provided will be regarded as a child's 'dental home' for the duration of that package.

Recognising the trends in population oral health outlined in 1.3.2, *Smile agus Sláinte* explicitly states that there is a need to widen access to routine primary oral healthcare for young children. The policy proposes that this will be achieved through the establishment of 'dental homes' in general dental practice where prevention is embedded from infancy. One of the aims of *Smile agus Sláinte* is to reduce the one third of children with caries in their primary dentition by age six and therefore the demand for multiple dental extractions under general anaesthesia (GA).

Low income and vulnerable adult medical card holders will also be entitled to 'packages' of care. These core services will also focus on prevention and basic primary dental care (for example examinations, cleanings, fluoride treatments, simple restorations, periodontal care and referrals) and be available approximately every two years to mid-life (25–65) and older age (65+) for low-risk adults. Higher risk groups, namely those living in non-fluoridated areas or socioeconomically disadvantaged urban areas will be entitled to additional supports, for example, a yearly prevention package. Like the current DTSS, a fee-per-item system will remain in place for additional care out-with the basic oral healthcare packages meaning GDPs will be remunerated via a blend of payment methods ('bundling' and FFS).

A reorientation of the HSE salaried OHS (referred to in *Smile agus Sláinte* as the 'Community oral healthcare service') will see the service become a network of clinics providing supplementary care for vulnerable patients referred from general dental practices. The OHS will provide additional clinical supports and time required to treat more vulnerable patients, for example, those with disabilities and care home residents. Designated 'Advanced oral healthcare centres', for example dental teaching hospitals, will provide more complex, specialist level oral healthcare. As of September 2025, none of the above reforms outlined have been implemented.

1.5 Oral health systems

1.5.1 Health systems

To help situate the challenges outlined above more clearly and understand what is meant by a 'health systems analysis', we must first define what is meant by the term 'health system'. There are numerous definitions of health systems which take into account variable understandings of system responsibilities, functions and boundaries. Murray and Frenk define health systems as *"the resources, actors and institutions related to the financing, regulation and provision of health actions, where health actions are any set of activities whose primary intent is to improve or maintain health"* (Murray & Frenk, 2000). Referred to as the 'WHO 2000' definition, this definition provides an action-focussed, operational definition of health systems and their boundaries where the primary stated goal is health improvement. Their definition is one frequently adopted in health systems analyses (Papanicolas et al., 2022). Others have adopted more wide-reaching definitions which share similarities with the WHO's 2000 definition, but which push the boundaries of health systems to consider more nuanced aspects such as the role of public and private organisations, public health, and the social determinants of health, for example education and income. These include the 'WHO Situation Analysis of the Health Sector' and the 'Health Systems in Transition' (HiT) definitions (Papanicolas et al., 2022).

On health systems' performance, Murray and Frenk outline four basic functions which health systems must perform in order to achieve their overall goals, namely: financing, provision, stewardship and resource generation (human, physical and knowledge)(Murray & Frenk, 2000). Recognising the limitations within this framework, in 2007 the WHO published an updated framework which introduced the concept of six health system 'building blocks'(World Health Organization, 2007). Rather than just focussing on system functioning, the 'WHO Building Blocks' analytical framework expands on Murray and Frenk's four functions and conceptualises health systems as comprising the following inputs: leadership and governance; service delivery; health system financing; health workforce; medical products, vaccines and technologies and health information systems (Figure 1).

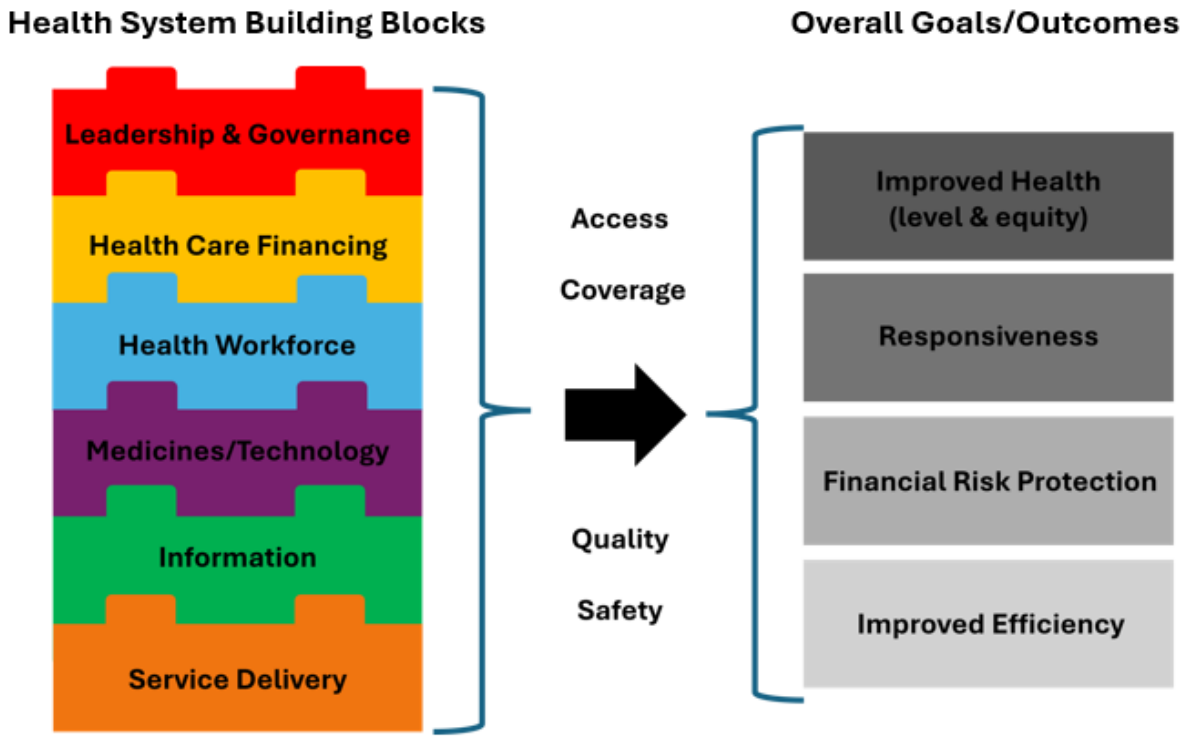

Figure 1: WHO health systems building blocks framework

The 'Building Blocks' framework defines a health system as consisting of *'all the organizations, institutions, resources and people whose primary purpose is to improve health. This includes efforts to influence determinants of health as well as more direct health-improvement activities'* (World Health Organization, 2010a). A stated aim of this framework is to promote a common understanding of what health systems are, including what constitutes health system strengthening (World Health Organization, 2007). It argues that to strengthen health systems, a clear understanding of system challenges is required, as well as an understanding of what investment is needed, its consequences and how these can be monitored. Health systems strengthening (HSS) is seen as key in helping achieve UN Sustainable Development Goals (SDGs), particularly SDG 3 ('Good Health and Well-Being') and achieving universal health coverage (UHC)(Kieny et al., 2017).

Health systems are often described as complex open systems which comprise a myriad of inputs and outputs which can interact to produce both intended and unintended outcomes. For the purposes of the analyses in chapters three, four and five of this PhD thesis, the focus will primarily be on the 'health workforce' building block but will consider and build theory around how broader health system factors interact to influence private GDPs' engagement in publicly funded, contracted oral healthcare. The 'workforce' building block which is defined as *"all people engaged in actions whose primary intent is to enhance health"*(World Health Organization, 2010a). Owing to

its comprehensive structure and widespread use in health systems research, I refer to the 'WHO Building Blocks' health systems framework throughout this thesis.

1.5.2 Oral healthcare systems

The 'ideal' oral healthcare system has been described as one that: is integrated with the wider general healthcare system; emphasises health promotion and disease prevention; monitors and responds to population needs; is evidence-based and cost effective; and is equitable, sustainable and universal (Tomar and Cohen, 2010). The structure of oral healthcare systems varies widely across the globe. Taking Europe as an example, there are six broad types of oral healthcare systems as described by Widström and Eaton (2004). These are the Nordic, Bismarkian, Beveridgian or Bevan, Southern and Eastern European, and Hybrid systems (Widström & Eaton, 2004). Like general healthcare systems, these systems might also be described as complex with differing levels of state financing, baskets of available care, population coverage and workforce characteristics (Glick et al., 2021; Patel, 2012). Across Europe, health systems are variably funded through general taxation and/or social (national) health insurance contributions with variable levels of patient co-payments (Winkelmann, Gómez Rossi, et al., 2022). Supplementary financing in the form of 'out-of-pocket' (OOP) private payments or voluntary private health insurance premia can come from individuals and families (Sinclair et al., 2019).

Regarding publicly funded oral healthcare, there are significant differences in how these systems are financed and the degree to which populations are covered across Europe, with distinctions often being made between children, vulnerable groups and adults, as is the case in Ireland (Winkelmann, Gómez Rossi, et al., 2022). In Denmark for example the 'Nordic' system offers universal oral healthcare (including orthodontics) free at the point of use to children up to 18 years while for low income, vulnerable and marginalised groups, variable supports and financing are in available dependent on the local municipality (Winkelmann, Gómez Rossi, et al., 2022). In general, there is no access to free universal oral healthcare for 'non vulnerable' adults however state subsidies are in place to cover some costs (Winkelmann, Gómez Rossi, et al., 2022). Across the Nordic region, for example in Finland and Sweden, care for paediatric populations is ordinarily provided by state operated, salaried Public Dental Services (Pälvärinne et al., 2018; Widström et al., 2019).

Across the UK, the National Health Service (NHS) is funded through a mix of general taxation, employee national insurance (NI) contributions and patient co-payments, as is the case for NHS primary dental care (with the exception of children and young people, low-income adults and other vulnerable groups who are 'exempt' from patient charges) (Brocklehurst et al., 2020). Under this

system, known as the 'Bevan' or 'Beveridge' system, the entire population is eligible for publicly funded healthcare including primary, secondary and tertiary oral healthcare (Widström & Eaton, 2004). The structure of NHS primary care dental services differs across each of the UK's four nations but generally comprises the following: General Dental Services (GDS) delivered by 'high street' independent GDPs holding NHS contracts and salaried Community or Public Dental Services (CDS or PDS) (Brocklehurst et al., 2016). While GDS practices generally serve the entire population and can offer private dental care in addition to NHS dentistry, CDS/PDS services function as 'safety net' or specialist referral services for patients who cannot be managed in general dental practices, for example, children who require treatment under GA or people requiring Special Care Dentistry (SCD) (Daly et al., 2013). NHS GDS provider payment methods also differ across the UK, for example in Scotland and Northern Ireland, GDPs are remunerated on a fee for service (FFS) and capitation/continuing care basis, while in England and Wales, they are reimbursed via a 'quasi salaried', pay-for-performance bundled care system characterised by annual clinical targets set by local NHS commissioners (Brocklehurst et al., 2016).

In Southern European health systems, for example Spain, Italy and Greece, the level of oral healthcare benefits for children is highly dependent on the region and/or patient age. In Italy for example, the SSN (Serviziosanitario nazionale – National Health Service) offers a minimum basket of services for children aged 0 to 14 which includes periodic assessments, prevention, restorative care and management of trauma (Winkelmann, Gómez Rossi, et al., 2022). Conversely, in Greece, parents and guardians can apply for a voucher ('Dentist pass') worth €40 for preventative dental care for children aged 6 to 12 years (European Commission, 2024). The voucher system was introduced in 2023 and covers oral hygiene instruction, professional cleaning and topical fluoride treatments. Oral healthcare coverage for adult populations is more restricted compared to children except for populations deemed vulnerable. For example, in Spain, state financed dental care for adults does not form part of basic UHC benefits packages except for emergency care (Winkelmann, Gómez Rossi, et al., 2022). In these regions, and in Eastern Europe the private dental sector and OOP payments feature prominently.

Finally, in Ireland, where this PhD is focussed, a 'hybrid' oral healthcare system exists and will be described in more detail in section 1.5.3.2 below and in chapter three.

1.5.3 Oral healthcare in Ireland

1.5.3.1 Ireland's general healthcare system

Ireland's general healthcare system is often described as 'complex' and comprises a mix of public and private financing and service delivery (Parker et al., 2025). A notable characteristic of the Irish

healthcare system is access to care often being dependent on ability to privately fund, rather than clinical need (Johnston et al., 2020).

The Department of Health (DoH) is Ireland's government department with responsibility for developing and overseeing national policy and strategy for health and social care in collaboration with regulatory bodies, the health service and various government departments (Department of Health, 2023). The national publicly funded health and social care provider is the Health Service Executive (HSE) which was established in 2005, replacing regional Health Boards (Wiley, 2005). As of 2025, the HSE is organised into six health regions within which sit twenty Integrated Healthcare Areas (IHAs) which deliver acute and community services and other services delivered by non-HSE providers (Health Service Executive, 2025). Broadly speaking, the Irish population is differentiated into two healthcare entitlement categories. One third of the population ('category 1' or 'medical card' holders) is eligible for free or subsidised services while the remaining two thirds of the population ('category 2') have fewer entitlements and must fund the majority of care through private means – 'out of pocket' payments or voluntary PHI (Thomas et al., 2021). Eligibility for medical cards is based primarily on a means test of one's income ('qualifying financial threshold') or having certain medical conditions or social vulnerabilities, for example people affected by the drug Thalidomide or women who have had a symphysiotomy (Citizens Information, 2025).

Notably, almost half of the Irish population purchase voluntary PHI, the second highest share in the EU (OECD/European Observatory on Health Systems and Policies, 2023; Thomas et al., 2023). Despite a robust economy characterised by a per capita gross national income (GNI) of almost $80,000 (2024) (the seventh highest according to the World Bank), Ireland is the only country in western Europe that does not provide free or subsidised primary care for the majority of the population (Thomas et al., 2021; World Bank, 2025). The global financial crisis of 2008, subsequent Great Recession and the 2010 Irish financial bailout by the International Monetary Fund (IMF), EU and European Central Bank (the 'Troika') marked a period of significant turmoil for the Irish healthcare system (Farsaci et al., 2024). This period was hallmarked by austerity measures and deep government budgetary cuts in state spending on healthcare. The effects of these radical and swift cuts were particularly felt in oral healthcare when state funded primary oral healthcare services were severely restricted, the reverberations of which are still being felt today (McAuliffe et al., 2022).

A hallmark of Ireland's complex health system are persistent gaps in healthcare coverage and a fragmented system of care whereby those who have the financial means or appropriate PHI premia can 'skip the queue' and access diagnostics and care faster than those without, including in the

public system (Mac Conghail et al., 2024). As previously outlined, the absence of universal primary healthcare makes Ireland an outlier in Europe, especially when juxtaposed against other similar high-income nations (Johnston et al., 2020; OECD/European Observatory on Health Systems and Policies, 2023).

1.5.3.2 Ireland's oral healthcare system

Like the general healthcare system, Ireland's oral healthcare system can also be described as a complex 'hybrid' model comprising public/private service provision and financing (Woods et al., 2017). In contrast to the general healthcare system however, most oral healthcare in Ireland is paid for privately by individuals and families. According to Ireland's Central Statistics Office (CSO), 80% of oral healthcare expenditure in Ireland is 'out-of-pocket' with state assistance towards dental care costs being very limited (Central Statistics Office, 2020). At present, there are significant gaps in state funded oral healthcare population coverage among large sections of society including very young children, people with disabilities, and older people (Department of Health, 2019). As a result, some individuals and families in Ireland face financial hardship due to significant OOP costs associated with private oral healthcare (Johnston et al., 2020)

Currently, there are the three publicly funded primary oral healthcare services or 'schemes' introduced briefly in section 1.2. Running alongside these services are secondary and tertiary specialist care services operated by or in partnership with the HSE, for example HSE orthodontics and oral surgery services and the two dental teaching university hospitals in Dublin and Cork (Woods et al., 2017). The three state-funded primary oral healthcare services were severely impacted by austerity cuts introduced in 2010. This period saw widespread spending cuts to both the DTSS and DTBS with the number of items of treatment scaled back significantly in both schemes (McAuliffe et al., 2022). Furthermore, a moratorium on HSE personnel recruitment resulted in a 20% reduction in the number of OHS (formerly PDS) dentists over a 10-year period while the size of the eligible population covered by the service increased by 20% (Irish Dental Association, 2023c).

A detailed description of Ireland's primary oral healthcare system will be provided in chapter three. The current system divides the population into three categories: children, adults, and vulnerable groups each of which is *technically* served by one the three respective dental services or schemes outlined above (Department of Health, 2019). The HSE OHS serves children and special needs groups, the DTSS serves adult medical card holders over 16 and the DTBS serves adults who have paid three years Pay Related Social Insurance (PRSI) contributions on their income (and their adult dependents) (Department of Social Protection, 2023b; Health Service Executive, 2023a).

Individuals who do not fall into one of the above categories are ineligible for state assistance and must finance dental care through direct OOP payments or voluntary PHI premia (Woods et al., 2017).

Under the Health Acts, the HSE is responsible for the OHS and providing free oral healthcare for children (Government of Ireland, 2009). It is also required to *'make available'* oral healthcare and dental appliances to eligible adults holding medical cards however the parameters around access are not specified (Government of Ireland, 1970). The three publicly funded primary care services are not, however comprehensive and offer very limited baskets of care only, for example, the DTBS offers a free annual oral examination and part subsidised cleaning while the DTSS additionally offers two restorations (fillings), any extractions and other care with the approval of HSE management, for example dentures and root canal treatment in anterior teeth (McAuliffe et al., 2022). While variable throughout the state, the OHS offering is generally limited to two or three courses of treatment (mainly prevention, some restorative and interceptive orthodontic care) targeted at children in 2nd and 6th classes of primary school (at ages 7/8 and 11/12 respectively) (McAuliffe et al., 2022). OHS 'school screening' service coverage is limited and heavily resource dependent throughout the state meaning some children are seen by a dentist much later than 2nd or 6th class while some are not assessed at all due to poor service provision locally (McAuliffe et al., 2025). Urgent dental care, including extractions, restorations and prescriptions for antibiotics is available to all children up to 16 via the HSE OHS (Green, 2021). OHSs also serve adults and children who require special care dentistry however this represents just 5% of OHS activity (Henry et al., 2021).

Ireland also fluoridates its municipal water supplies to 0.6–0.8 parts per million (ppm) fluoride (target of 0.7 ppm) (Cronin et al., 2021). The HSE is legally responsible for funding and monitoring fluoridation with Uisce Éireann (formerly 'Irish Water') undertaking fluoridation on behalf of the HSE as part of overall water treatment and supply (Uisce Eireann, 2014).

1.6 Oral healthcare workforce

As outlined in 1.5.1 above, the health workforce, also referred to as 'human resources for health' (HRH) is one of the six WHO health system building blocks. By extension, the oral healthcare workforce can be considered one of the key building blocks of oral healthcare systems, without which services would not function adequately. Oral healthcare teams comprise a range of dental healthcare professionals (DHPs). While these vary by jurisdiction (in terms of availability, scopes of practice and nomenclature), in Ireland they include dentists, dental hygienists, dental nurses, orthodontic therapists, dental technicians and clinical dental technicians (CDTs). While dentists'

scopes of practice (SoP) include the full range of oral healthcare treatments, the SoPs for other DHPs are narrower, for example, in Ireland dental hygienists' SoP includes non-surgical periodontal treatments and preventative care. Another class of 'mid-level' practitioner, dental therapists, are not recognised in Ireland but are a class of dental auxiliary or dental care professional (DCP) in other health systems including the UK, Australia and some states in the USA. In the UK, dental therapists' SoP encompasses that of dental hygienists plus direct restorations (fillings) in adult teeth and all treatments in deciduous (primary) teeth, including placement of preformed metal crowns and extractions.

The focus of this PhD thesis is publicly financed primary oral healthcare which is contracted to private GDPs by state health systems including Ireland's. For clarity, GDPs are independent, mainly self-employed primary care dentists who provide private and/or publicly funded oral healthcare to the public in general dental ('high street') practices (NHS Health Careers, 2025; The King's Fund, 2023; Winkelmann, Gómez Rossi, et al., 2022). General dental practices are businesses owned by GDP principals, partnerships or dental bodies corporate (The King's Fund, 2023). As independent businesses their capital assets and staff therefore are held and managed outside the direct control state healthcare system, within the private sector (Brocklehurst et al., 2016). Conversely, state funded salaried dental services (including the HSE OHS) are, for the most part operated directly by public health authorities in state owned premises and delivered by employed clinicians (Nolan, 2019).

1.6.1 Oral healthcare workforce models in Ireland

Delivery of the three state-funded primary oral healthcare services described above is via two models: salaried and contracted care. The OHS is delivered by salaried primary care dentists and auxiliaries employed directly by the HSE (Woods et al., 2017). Care is provided in state owned and operated premises. The DTSS (colloquially referred to as the 'medical card' scheme) and DTBS (the 'PRSI' scheme) are delivered by independent, private GDP contractors (Woods et al., 2017). Both schemes remunerate dentists on a fee per item of service (FFS) basis (Nolan, 2019). There are no capitation or continuing care payments or additional incentives available for adjunctive services, for example domiciliary dental care (HSE Primary Care Reimbursement Service, 2022a). GDPs do not receive funding towards practice set up or operational costs (for example practice grants), and unlike salaried OHS dentists and general medical practitioners (GMPs), they do not have access to state workplace superannuation schemes, for example the HSE General Medical Services (GMS) Superannuation Plan (Irish Dental Association, 2013).

Dentists wishing to apply for a DTSS contract must meet specific eligibility criteria including current registration with the Dental Council of Ireland, evidence of professional, employer and public liability insurance, evidence of an x-ray licence and tax clearance (HSE Primary Care Reimbursement Service, 2020a). Private GDPs apply to their local HSE OHS Designated Officer (generally Principal Dental Surgeons) for a DTSS panel number, allowing them to provide services under contract to the HSE. The DTSS is administered by the HSE Primary Care Reimbursement Service (PCRS) which is responsible for managing claims and payment of fees to dentists (Health Service Executive Primary Care Reimbursement Service, 2020). Clinical Dental Technicians (CDT) who are a class of dental auxiliary trained in the provision of removable prostheses (dentures) directly to patients can also hold DTSS contracts for the purposes of providing partial or complete dentures to patients whose oral health is established through a recent visit to a dentist (Health Service Executive, 2024).

1.6.1.1 Oral healthcare workforce and Smile agus Sláinte

On the oral health workforce, *Smile agus Sláinte* states that *"a suitably skilled workforce should be available to provide appropriate oral healthcare across all settings, ranging from primary to advanced oral healthcare".* It highlights the fact that dentists in Ireland are concentrated in large urban centres with fewer dentists practising in rural areas. This has resulted in impeded access to oral healthcare for people living in these areas, particularly older adults living along the west coast of Ireland from County Mayo to West County Cork. It also highlights a lower proportion of early career dentists working in rural and western seaboard areas compared to urban areas and proposes additional professional supports to encourage the redistribution of dentists to underserved areas. These supports include mentoring programmes and long-distance continuing professional development (CPD) programmes. *Smile agus Sláinte* also supports expanding the scope of practice for dental hygienists and direct access for patients to facilitate delivery of preventative services. The policy recognises that the primary barrier to direct access is the Dentists Act of 1985 which states that patients must be assessed by a dentist before attending a dental auxiliary (Government of Ireland, 1985). While the policy makes no reference to introducing dental therapists in Ireland, the Department of Health has since commenced a scoping project exploring the potential for a 'mid-level' oral healthcare practitioner in Ireland *'as an additional measure to increase capacity in the workforce'* (Department of Health, 2024; Houses of the Oireachtas, 2025a).

While expansion of scopes of practice, direct access to dental hygienists and new mid-level provider may facilitate a widening of access to preventative care, dentists will likely remain the cornerstone of oral healthcare services in Ireland. However, as highlighted in the policy, a major

challenge facing workforce planners and policymakers is a paucity of meaningful and contemporaneous data relating to the oral healthcare workforce in Ireland, including dentists. At present, the sole authoritative databases on the dental workforce in Ireland are the registers of professionals held by the Dental Council of Ireland (Dental Council of Ireland, 2023). The Dental Council's register of dentists was utilised during *Smile agus Sláinte's* development as the main source of data on the dentist workforce. The policy notes that in order to fully assess future workforce requirements for primary oral healthcare services, a deeper understanding of the characteristics of the workforce and services provided will be required. It advocates for the annual collation of information on the dental workforce and the creation of a workforce and dental practice database which would not only allow for assessment of workforce trends, but act as a source of information on oral healthcare services for the public to access. Chapter three will delve into available workforce indicators and shortcomings in existing workforce data intelligence in Ireland in more detail.

Smile agus Sláinte – National Oral Health Policy is Ireland's first oral health policy to be published in over 25 years. Central to the policy's success is the widening of access to routine, state-funded primary oral healthcare for eligible populations including children, adult medical card holders and other vulnerable groups. This will be achieved through wide ranging reforms to state funded primary oral healthcare services, both salaried and contracted services. As such, the success of such reforms will be predicted on the availability and accessibility of the workforce- primarily private GDP-contractors who will be expected to apportion a greater proportion of their clinical time to delivery of state financed care, including care for children in addition to DTSS and DTBS-eligible populations. As of September 2025, an implementation plan for *Smile agus Sláinte* remains to be published.

1.7 Oral healthcare workforce challenges globally

Ensuring the adequate supply, distribution and skill mix of the oral health workforce is key to strengthening oral healthcare systems, widening access to early preventative and routine care and progressing the UHC agenda (Gallagher et al., 2024; World Health Organization, 2024). Despite this, the oral healthcare workforce is unevenly distributed across the globe and therefore insufficient to address the oral health needs of the populations they serve (Gallagher et al., 2024). According to Gallagher et al., (2024), the global dentist-to-10,000 population ratio is approximately 3.3 while for the total oral healthcare workforce (which includes all dental healthcare professionals), this ratio sits at 5.3 per 10,000. Across Western Europe, countries have experienced only a slight increase or in some cases a decrease in the dentist-to-population ratios

during the period 2008 and 2019 (Winkelmann et al.,2022). It is recognised that the spatial maldistribution of dentists and other DHPs can act as significant barrier to care access. This is of particular concern where dentists and other dental professionals are disproportionately concentrated in urban and affluent areas to the detriment of rural and disadvantaged areas (Gallagher et al., 2024; Northridge et al., 2020; Winkelmann, Gómez Rossi, et al., 2022). These discrepancies in the spatial distribution of dentists and DHPs can cement inequalities, especially among rural or low-income populations who may experience restricted access to care due to low workforce numbers (Gallagher et al., 2024). There is a need therefore for health systems to address where oral health providers practice, not only how many there are, is therefore a crucial aspect of system strengthening. International policy bodies now explicitly acknowledge that an 'uneven distribution of the oral health workforce' undermines access to care and must be remedied as part of UHC efforts (FDI World Dental Federation, 2021; Fisher et al., 2018).

As outlined in section 1.6 above, oral healthcare systems globally may engage the services of independent, private GDPs as third-party contractors to deliver publicly funded care. This presents both an opportunity and a challenge for health systems planners and policy makers. While the availability of these practitioners presents an opportunity to utilise and 'scale up' the existing primary care workforce and therefore capacity to deliver state funded care, engagement on the part of GDPs is entirely voluntary. These models of contracting primary dental care are, therefore, entirely reliant upon a steady supply of GDPs voluntarily opting into or remaining in such services.

Recruitment and retention of health and social care professionals is recognised as a global challenge with the WHO estimating a shortfall of 10 million healthcare workers by the year 2030 (World Health Organization, 2022b). The WHO further cites workforce shortages as a major barrier to achieving UHC by 2030, particularly in health systems where there are maldistributions in the healthcare workforce, for example in remote and rural areas. Factors associated with shortages of healthcare workers include, among others, under-investment in education and training, failure to plan resources in line with population needs, healthcare worker migration and mobility owing to suboptimal terms and conditions of employment, a perceived lack of respect and trust between management and the profession and limited opportunities for career progression (Byrne et al., 2021; Coleman & Finn, 2019; Humphries et al., 2019; World Health Organization, 2022b).

Globally, health systems, including Ireland, are experiencing challenges with respect to private GDPs' engagement in publicly funded, contracted primary oral healthcare. Ireland's closest neighbour, the UK, is experiencing a reduction in GDPs' participation and engagement in contracted NHS general dental care. A report by the UK's National Audit Office (NAO) found that in 2023/2024

there were almost 500 fewer dentists holding NHS contracts in England compared to 2019/2020. On NHS commitment, NHS England's 'Dentists' Working Patterns, Motivation and Morale' 2022/2023 report found NHS-committed GDPs in England apportioned an average of 24.8 hours per week on NHS dentistry (equating to 70% of their working week) (NHS Digital, 2024). This compared to an average of 27.3 hours or 74% or total clinical working time in 2018/2019, representing an average reduction of 2.5 weekly hours spent on NHS care in four years. The report also found motivation and morale levels among NHS dentists had dropped since the 2018/2019 survey in England, Scotland and Wales with the most frequently cited contributory factor being increasing expenses and/or declining income. The report found that two thirds of dentists in the UK were considering leaving dentistry. According to the UK House of Commons Committee of Public Accounts 2025 report 'Fixing NHS Dentistry' there were a substantial number of vacant posts across NHS dentistry, for example in March 2024 there were more than 5,500 dental vacancies with many of these going unfilled for over 6 months (House of Commons Committee of Public Accounts, 2025). Mirroring *Smile agus Sláinte*, the report cites acute challenges in both recruitment and retention and engaging GDPs in NHS care in remote, rural, coastal and deprived areas and the need for additional workforce supports to address these challenges.

A scoping review published in 2023 exploring workforce challenges in dentistry in the UK found several factors affecting recruitment and retention. Among dentists, the most frequently cited factor was the NHS England GDS contract (Evans et al., 2023). Described as 'fundamentally flawed', this model of care is believed to account for high levels of stress and burnout among UK dentists with people being driven 'out of the profession' due to high workloads. Other reported factors included suboptimal remuneration coupled with increased professional costs leading to long term reduction in incomes, limited opportunities for career progression in primary care and geographical factors, for example, practice rurality, poor transportation links, the urban prominence of dental teaching hospitals, and therefore postgraduate training opportunities. Similarly, a 2024 review by Holloway and Chesnutt sought to identify factors contributing to job satisfaction or dissatisfaction of among staff in general dental practice. Utilising Herzberg's Motivation-Hygiene theory, the authors of that review found contractual arrangements constructed around targets, time pressures and unfavourable remuneration were major contributory factors to GDP dissatisfaction in publicly funded primary dental care (Holloway & Chestnutt, 2024). The findings of the dental studies echo an earlier systematic review examining GMP recruitment and retention across the OECD. In their 2017 review of 138 studies Marchand and Peckham found that GMP career satisfaction and dissatisfaction were related to three factors, namely stressors (for

example, workload), characteristics of posts (for example, job autonomy) and other factors (for example, geographical location of practices) (Marchand & Peckham, 2017).

1.7.1 Oral healthcare workforce challenges in Ireland

Recent years have borne witness to a decline in the number of private GDP-contractors participating in the HSE DTSS for low-income adult medical card holders (Houses of the Oireachtas, 2024a). This decline has garnered widespread political and media attention owing to challenges faced by medical card holders in accessing timely care with reports of some towns and counties being without any 'medical card' dentist and patients travelling long distances to access care. This reduction in DTSS capacity has reportedly resulted in long waiting times for care, increased unmet oral healthcare needs and financial hardship as patients fund care privately (Houses of the Oireachtas, 2024b). The decline in GDP participation has been notably acute since the onset of the COVID-19 pandemic in March 2020. This period was marked by the suspension of general dental services (between March and May 2020) owing to infection prevention and control (IPC) measures and reports of an absence of clear health systems guidance on safe clinical practice and a failed promise to provide DTSS contractors with personal protective equipment (PPE) by the HSE (Dental Council of Ireland, 2020a, 2020b). Concurrently, within the salaried HSE OHS, workforce and capacity challenges have also severely impacted services in recent years. Curtailment of OHS clinical services during COVID-19, the redeployment of staff (including OHS dentists) to testing and vaccination sites have led to long delays in the dental school screening programme (McAuliffe et al., 2022). A HSE-wide ransomware ('cyber') attack in May 2021 which resulted in the nationwide shutdown of all of HSE IT systems curtailed OHS services further, compounding post-COVID recovery delays (Department of Health, 2022b; HSE National Quality and Patient Safety Directorate, 2022). Some HSE Oral Healthcare Services are currently only screening 6th class pupils, in some instances up to five years late (O'Flynn, 2023). Prior to the COVID-19 pandemic uptake of school screening and subsequent treatment was high among children at 95% nationally. HSE salaried services have also experienced a reduction in the number of dentists employed, declining by 23% between 2006 and 2022 with reports of an increased number of vacancies across the country and difficultly filling posts (Houses of the Oireachtas, 2024b). The HSE's 2024 'Pay and Numbers' strategy has imposed a fixed employment ceiling across all health services deepening workforce capacity challenges further (Hoey, 2024). Conversely, Ireland's other contracted primary oral healthcare scheme, the DTBS has not experienced a decline in GDP-contractor participation. Reflecting the international experience outlined in 1.7 above, the reasons behind the decline in private GDP participation in the DTSS have

been reported as including low FFS remuneration rates, system constraints which impede clinical autonomy and burdensome scheme administration (O'Neill, 2022).

1.8 Research gap

While much of the existing research illuminates important contract, practice or individual level factors that can influence GDP's decisions to engage in publicly funded, contracted primary oral healthcare, there is a paucity of primary research examining this topic from the perspective of the health system that is responsible for designing, funding and administering such services. Recruitment and retention of healthcare professionals in publicly funded oral healthcare systems remains a global challenge and a major barrier to achieving UHC for oral health and widening access to care for all but especially the most vulnerable populations. Challenges in health systems workforce are often described as 'wicked' problems rooted in a myriad of complex and dynamic interactions, and context-specific nuances (Johnson & Ahluwalia, 2025). The current crisis surrounding the declining number of private GDPs engaging in publicly funded, contracted primary oral healthcare is symptomatic of wider health system problems and not necessarily a driver of such problems. Therefore, to try and solve such challenges and strengthen healthcare systems to achieve national and international policy objectives on UHC, there is a requirement for a multidimensional approach rooted in systems and complexity science, rather than more traditional 'linear' approaches which may not fully address the complexity of these inter-connected issues (Duddy & Wong, 2023; Johnson & Ahluwalia, 2025).

Increasingly in health systems research, academics are adopting systems-orientated approaches for addressing 'wicked' problems in population health to better understand the complexities of such problems and to identify potential solutions (Baker, 2019). This approach has been applied previously in oral health systems research – specifically with respect to publicly funded oral healthcare and the workforce. In their 2012 analysis paper Professors Brocklehurst and Tickle utilised 'systems thinking' as a means of informing and developing an oral health workforce planning tool for the UK. The authors considered the various interactions, feedback and delays that influence the balance between different components of the health system (Brocklehurst and Tickle, 2012). They examined the complex interactions between factors on the demand and supply side of care in NHS dentistry and suggested that the net flow of dentists in the UK oral healthcare system was dependent on a myriad of factors including the right legislative environment and contractual arrangements, financial support and incentives, skill mix utilisation and market forces driven by people expressing a need for care.

In the context of existing workforce and patient access challenges in the Irish primary oral healthcare system, change implementation and the requirement to plan for an appropriate workforce to deliver on *Smile agus Sláinte's* objectives, understanding complex system drivers and how they influence the capacity of the system to deliver services can help narrow or possibly bridge a policy implementation gap. Against this backdrop and the need to build capacity for proposed reforms, *Smile agus Sláinte* has been beset by implementation delays and a dearth of meaningful data relating to the oral healthcare workforce, in particular surrounding GDPs, productivity and skill mix utilisation (Department of Health, 2019; Haase & Batchelor, 2014)

To the best of this PhD candidate's, and the wider supervisory team's knowledge, there have been no studies conducted internationally explicitly investigating the factors influencing private GDPs' engagement in state funded, contracted primary oral healthcare from a health systems perspective. Additionally, there has been no previous primary research conducted to date on this topic in Ireland. Therefore, by conducting the first study of this kind in the Irish context, this research, specifically study three, will contribute to original knowledge. By examining this topic through a health systems lens, it will also add to the existing evidence base and contribute to expanding the knowledge base surrounding contracting with private dentists in the provision of state-funded primary oral healthcare globally.

Having sufficient numbers of publicly contracted privately practising dentists is central to *Smile agus Sláinte's* implementation. This PhD research will therefore provide health systems leaders, managers and policymakers with robust primary evidence which can inform the implementation of *Smile agus Sláinte* – specifically service reforms which will rely upon private GDP-contractors and ultimately promote access to oral healthcare for Ireland's most vulnerable populations including low-income and paediatric populations.

1.9 Thesis aim and objectives

The overarching aim of this PhD is to conduct a health systems analysis to identify and explain what are the health system factors influencing private general dental practitioners participation in publicly funded, contracted primary oral healthcare services and therefore the implementation of workforce changes as part of service reforms proposed in *Smile agus Sláinte* – National Oral Health Policy (NOHP).

The research undertaken in this thesis is divided into three studies (Figure 2):

- A documentary and secondary data analysis describing the current primary oral health system in Ireland, availability of workforce indicators and trends in the Irish GDP workforce relevant to state-funded, contracted primary oral healthcare;
- A realist review of peer-reviewed and other literature examining health system factors influencing private GDPs' engagement in state-funded, contracted primary oral healthcare;
- A realist interview study building on the review in study 2 which uses some of the findings from the review as a jumping off point to examine health system factors influencing engagement of GDPs in state-funded, contracted primary oral healthcare for low-income adult populations in Ireland.

The aims of the studies are:

- Study one: To describe the current primary oral healthcare system in Ireland; to identify and map GDP workforce indicators and compare the distribution and characteristics of GDPs in Ireland by current state-funded dental scheme participation;
- Study two: To review published peer reviewed and other grey literature to explain how, why and under what circumstances do health systems influence private GDPs' participation in state-funded, contracted primary oral healthcare services;
- Study three: To build on study two to explain how health system factors influence private GDPs' engagement in state-funded, contracted primary oral healthcare for low-income adult populations in Ireland.

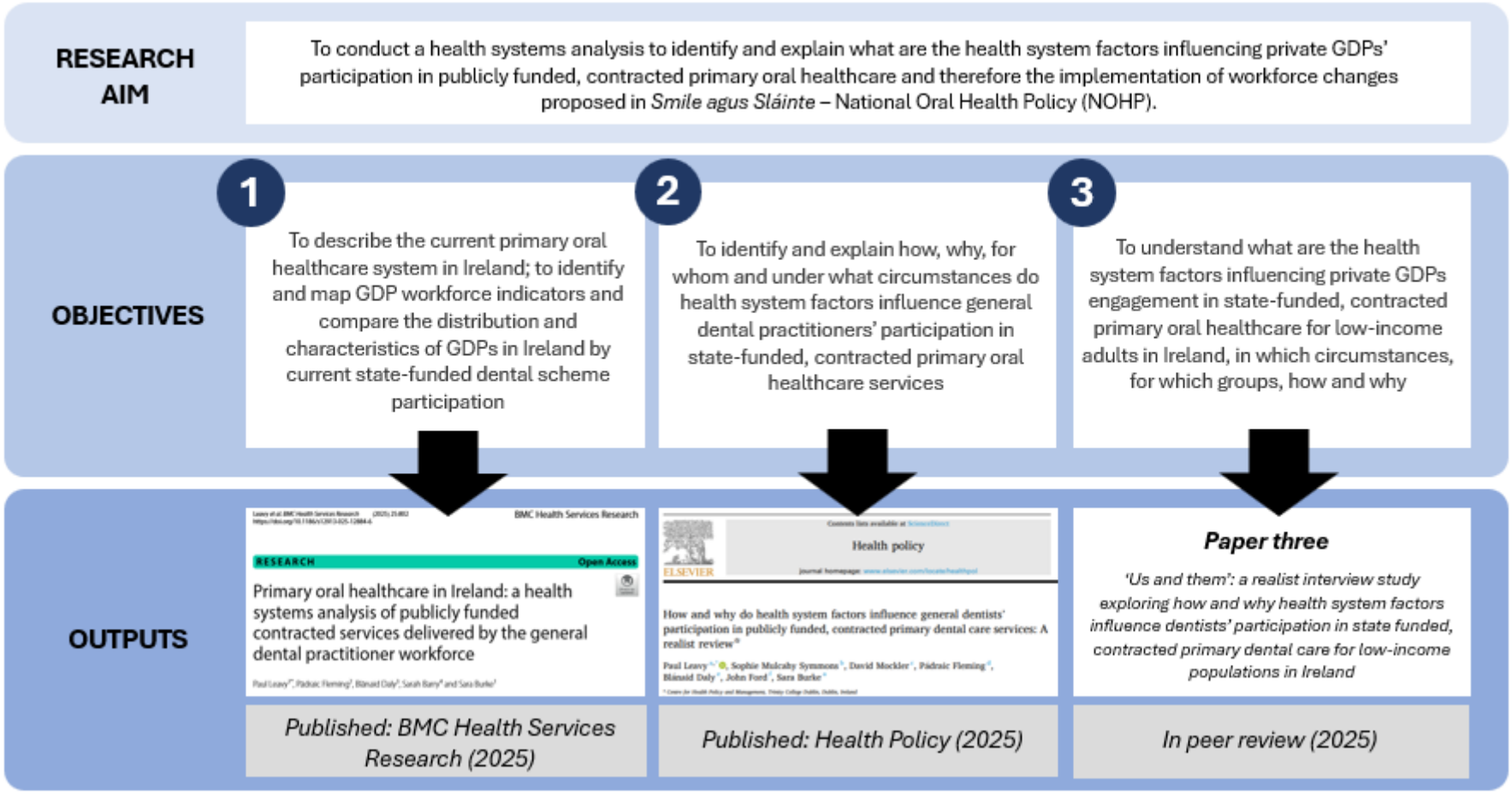

Figure 2: Overview of PhD research

This PhD research is a health systems analysis which primarily uses realist approaches to address the overarching thesis aims and objectives.

Study one uses a documentary analysis and secondary data analysis to 'paint a picture' of the Irish primary oral healthcare system and its origins and to articulate the existing workforce challenges with respect to private GDPs' declining participation in state-contracted care for low-income adults. As such, it provides a 'diagnosis' for the problem under investigation in this thesis and sets the scene for the two realist studies which subsequently look at understanding why and how these workforce challenges have emerged. Documentary and secondary data analyses are the methods adopted as these are best suited to address the respective objectives of this study.

Studies two and three of this thesis adopt a theory-driven realist methodological approach in the school of Ray Pawson and Nicholas Tilley (Pawson, 2006a, 2013; Pawson & Tilley, 1997). This approach was used because it is best suited to address the research objectives, specifically the complexities within the area of investigation which will be discussed in more detail in subsequent chapters. The realist studies expand on one another with the realist interview study in chapter five taking its starting point in four of the six context-mechanism-outcome configurations (CMOCs) developed in the realist review of the international literature (chapter four), analysing a subset of the review's findings in more depth. The research packages of this thesis are co-ordinated in such a way to have each study lead and/or build on the one before, contributing different answers to the overarching research question: what are the health systems influencing private GDPs' engagement and participation in state-funded, contracted primary oral healthcare. The realist review and realist interview study provide evidence-based and theory-informed explanations for the problem identified in study one therefore closing the loop of investigation in this PhD.

The three studies are presented in chapters three, four and five as or in the style of academic papers published in a peer-reviewed journal. At the time of submission, two of the three studies, studies one and two, have been published in peer-reviewed academic journals. Study three (the realist interview study) has been submitted for journal peer review and is therefore presented as per the submitted manuscript in chapter five.

For clarity, while this PhD thesis is submitted as a monograph, it is compiled as 'PhD and Publication'. As per Trinity College Dublin's guidelines on PhD and Publication as set out in the School of Medicine Handbook for Postgraduate Research Students, "*Ph.D and Publication guidelines refer to the inclusion of published work conducted by the Ph.D student in their thesis. This work must have been carried out during the Ph.D, while on the Ph.D register"* and specifically with regard to thesis results chapters it states: *"Results Chapters – the inclusion of publication(s)*

into results chapter(s) will be permitted. Publications will substitute full result(s) chapters or part of result(s) chapters".

The postgraduate handbook is available online at:

https://www.tcd.ie/media/tcd/medicine/education/docs/School-of-Medicine-Postgraduate-Research-Handbook-2024_2025.pdf

1.10 Thesis overview

This doctoral thesis comprises six chapters based on three studies (Figure 3). Chapter one has set out the background and rationale for the research packages and research questions.

Chapter two outlines the methodology, which for this PhD is of mixed methods comprising documentary and secondary data analyses and realist methodological approaches within the school of Pawson and Tilley (Pawson, 2006a, 2013; Pawson & Tilley, 1997). This chapter outlines the realist methodological approach, its ontology and epistemology and how it these approaches are operationalised. Furthermore, it explains why documentary and secondary data analyses were appropriate for study one and why realism was appropriate for addressing the complex areas of inquiry in studies two and three.

The third chapter presents the first study of this PhD: a documentary and secondary data analysis describing the primary oral healthcare system in Ireland and trends in the GDP workforce as they relate to contracted primary care. Chapter three frames the broader problem under investigation in this PhD and presents the entire study from start to finish as published in BMC Health Services Research in 2025.

Chapter four outlines the second study: a realist review of the international literature exploring health system factors which influence private GDPs' participation in state-funded, contracted primary oral healthcare services. This chapter presents the entire study encompassing literature searching, analysis, synthesis, construction of CMOCs and realist final programme theory wherein the study's findings are combined into an overarching theory to explain causation, and which is presented at a high level of abstraction. This chapter is presented as the article I published in Health Policy in 2025.

Chapter five describes the final study of this thesis which is a realist interview study investigating health system factors influencing private GDPs engagement in state-funded, contracted primary oral healthcare for low-income adults in Ireland. It builds directly on the realist review and similar to chapter four, this chapter describes the realist approach that was adopted including the primary

data collection approach, analysis, synthesis and theorising, and the development of a final programme theory. It provides causal explanations for the GDP workforce challenges outlined in study one.

Finally, chapter six provides a unified synthesis of all three studies – the documentary and secondary data analysis and the two realist studies. It then provides a discussion of the thesis as a whole, including the findings of the three studies and reflections on the use of realist approaches, documentary and secondary data analysis approaches. Finally, it suggests policy, research and practice recommendations and proposals for future research.

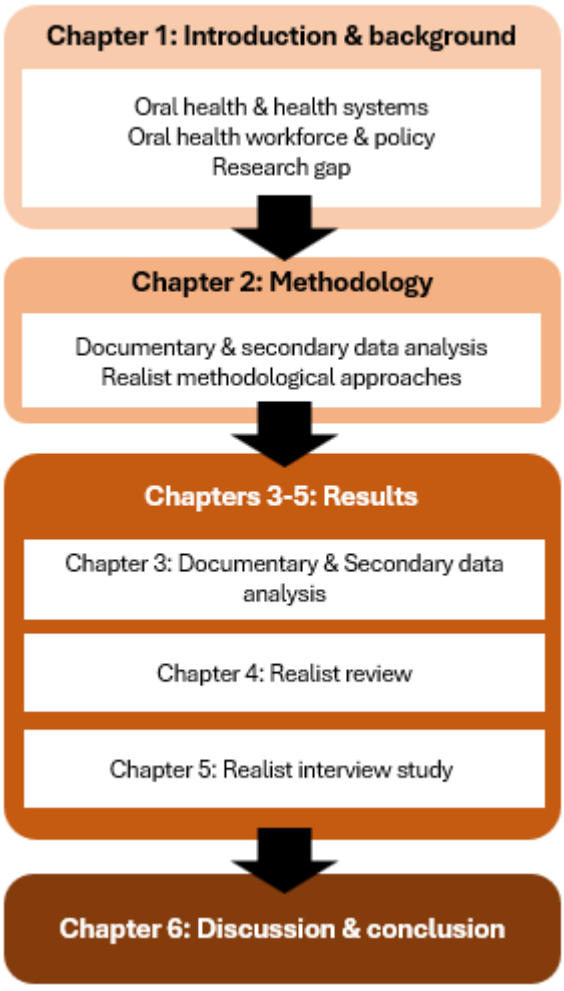

Figure 3: Thesis outline

Chapter 2 Methodology

2.1. Chapter outline

This chapter outlines the overarching methodology adopted for this PhD thesis which comprises mixed methods. Firstly, it provides an overview of the documentary and secondary data analysis research methods utilised in study one and its rationale. This study provides a detailed description of the primary oral healthcare system in Ireland and its origins, and to identify and map workforce indicators specific to state-funded, contracted primary oral healthcare. Furthermore, it compares the distribution and characteristics of GDPs by current state dental scheme participation in Ireland. The rationale behind this study is that it helps 'paint a picture' of the primary oral healthcare system in Ireland and trends in the Irish GDP workforce. It provides an appraisal of the primary oral healthcare system functioning and performance as they relate to the GDP workforce over a 15-year period and therefore sets the scene for the following two studies by highlighting the existing challenges in contracted primary dental care in Ireland and framing these against the current Irish oral health policy landscape.

A sizeable proportion of this chapter is dedicated to describing realist methods. Realist methodological approaches in the school of Ray Pawson and Nicholas Tilley are used in this thesis in both the realist review and realist interview study (studies two and three respectively) (Pawson & Tilley, 1997). I discuss the aims of realism, underlying ontology and epistemology underpinning realism in the school of Pawson and Tilley, highlighting the types of research questions this approach is especially suited to, such as those investigating complex social phenomena or healthcare systems where causality cannot be directly observed or measured. Thereafter, I examine how realism conceptualises causality and emergence and explain how realism is applied in practice by outlining the research process which involves programme theory development through the employment of iterative research designs.

Gaining a deep understanding of realist concepts and developing expertise in applying realism formed a significant part of the work behind the research presented in this thesis. Therefore, I have made a point of explaining realism in detail, as realist approaches are (comparatively) less established, and perhaps less intuitive to those less familiar with the field.

2.2 Mixed methods approach

The overarching research aim should act as a compass, guiding the selection of an appropriate methodology (Creswell & Creswell, 2017). It defines what the research intends to achieve, while

the methodology provides the systematic approach to reach that goal. Essentially, the aim dictates the "what," and the methodology explains the "how".

This PhD research sought to generate explanatory theory to explain how and why health system factors influence private GDPs' engagement in state funded, contracted primary oral healthcare in Ireland (and elsewhere). To provide background context and frame the broader problem under investigation, it also set out to quantify some of the workforce challenges in state-funded primary oral healthcare in Ireland utilising publicly available datasets. These challenges specifically relate to decreasing number of private GDPs engaging in the DTSS for low-income populations. Mixed methods were therefore deemed to be the natural fit for addressing this PhD's research aim and objectives.

Mixed methods in research entails the integration of both quantitative and qualitative methods in a single study or series of studies and is increasingly being used by health services researchers (Tariq & Woodman, 2013; Zhang & Creswell, 2013). In quantitative research, numerical data is collected and analysed using statistical methods to produce objective and valid mathematical representations for empirical phenomena (Borgstede & Scholz, 2021). Quantitative methods are often used to test hypotheses, make predictions or, as is the case in parts of this PhD, identify patterns (Allen, 2017). While quantitative methodological approaches are useful for establishing generalisable facts in controlled environments, they often fail to fully elucidate the deeper, underlying contextual understandings sought from such research (Polit & Beck, 2010).

Conversely, qualitative research approaches utilise non-numerical data (for example, spoken or written word) to explore subjective views, experiences and attitudes (Morse & Field, 1996). Data in qualitative research are often captured via interviews, focus groups or observations (Gill et al., 2008). In contrast to quantitative research, qualitative research seeks to produce rich and detailed descriptions of phenomena under investigation (Munhall, 2012). While quantitative research has historically predominated in health services research (for example, observational studies or clinical trials), the use of qualitative research and mixed methods have gained in popularity most notably since the mid-1990s (O'Cathain et al., 2007). It is important to highlight however that quantitative and qualitative methods are not mutually exclusive nor are they in conflict with one another. To the contrary, these approaches are useful in addressing different aspects of the same research question, hence why the approach was adopted for this PhD thesis (Stewart et al., 2008).

2.3 Health systems analysis

According to the Alliance for Health Policy and Systems Research, health policy and systems research (HPSR) can be defined as a field *"that seeks to understand and improve how societies*

organize themselves in achieving collective health goals, and how different actors interact in the policy and implementation processes to contribute to policy outcomes. By nature, it is inter-disciplinary, a blend of economics, sociology, anthropology, political science, public health and epidemiology that together draw a comprehensive picture of how health systems respond and adapt to health policies, and how health policies can shape – and be shaped by – health systems and the broader determinants of health." A central tenet of HPSR is that it should inform and influence health policies and health systems to pursue population health goals (Peters, 2018). HSPR can cover a diverse range of subject areas including health systems governance, financing, policy implementation and service reform in both the private and public healthcare sectors (Gilson et al., 2012).

Health systems analyses (HSAs) are assessments of health systems and their performance. HSAs examine health systems' inputs, processes, and outputs including politics, historical events and organisational arrangements, and analyse how they interact to produce outcomes of interest (Berman & Bitran, 2011). Other terms used to describe HSAs include 'health system profiles', 'health sector situation analyses' and 'health systems performance assessments' (Papanicolas et al., 2022). Like health systems themselves, there is widespread variability in their descriptions, scope, content and how they are conducted, mirroring perhaps the variability and complexity of the systems they investigate (Waitzberg et al., 2024). HSAs can range from assessments of health system structures to distinct system functions and measurements of system performance. Despite different terminology being used to describe assessments, HSAs (and equivalents) tend to share common objectives, namely to produce evidence to inform health policy, strategy, system planning or reform, among others (Papanicolas et al., 2022). In their 2011 World Bank discussion paper 'Health Systems Analysis for Better Health System Strengthening', Berman and Bitran suggest that HSAs should form an integral aspect of good practice in health systems strengthening efforts and advocate for the development of HSA as a distinct methodological approach (Berman & Bitran, 2011).

This health systems analysis focuses on Ireland's primary oral healthcare system- specifically publicly funded care provided by private GDP contractors. It is recognised in both national and international oral health policy that sufficient workforce capacity will be required to deliver essential packages of oral healthcare in Ireland and elsewhere into the future as part of efforts to achieve UHC for oral health (Department of Health, 2019; World Health Organization, 2024). Key to informing workforce planning, system reform and successful policy implementation is an understanding the oral health workforce who will be expected to deliver care on behalf of the state. This includes its composition, characteristics, clinical productivity, skill sets, skill mix utilisation

and geographic distribution, gathered through appropriate means of data collection. This is especially prudent at the current time when Ireland finds itself amid a workforce capacity crisis in the sector, and where robust workforce data intelligence and primary research in this area are lacking.

Indeed, the WHO Global Strategy on Human Resources for Health 2030 advocates for member states to strengthen and monitor workforce data as part of efforts to implement wider healthcare strategies and policies (World Health Organization, 2016). Workforce supply is an important indicator of effective healthcare coverage, however it is not sufficient on its own for the purposes of workforce planning. This is especially the case when not only considering population ratios, but the inherent complexities of population health needs and demands, changing healthcare delivery models and requirement to plan for emergency scenarios (as demonstrated during the COVID-19 pandemic when oral healthcare services were severely curtailed globally)(Marcenes, 2020). The WHO recommends adopting a more nuanced approach to workforce assessment and planning which includes examination of accessibility and equitable distribution of the workforce, workforce competencies, and it's acceptability to the population's sociocultural expectations. Only when these criteria are met, and when the workforce is sufficiently supported by the health system, can theoretical health coverage truly translate into effective coverage (World Health Organization, 2016).

2.4 Documentary and secondary data analysis

The first study in this thesis (chapter 3) referred to as a 'health systems analysis' in the published paper comprises two arms: a documentary analysis and a secondary data analysis. Documentary analysis is used to describe the current oral healthcare system in Ireland and its origins, with an emphasis on publicly funded primary care services. Secondary data analysis is used to identify and map GDP workforce indicators specific to state-funded, contracted primary oral healthcare in the Irish context and compare the distribution and characteristics of GDPs in Ireland by current state dental scheme participation. By providing a detailed description of the oral healthcare system, GDP workforce and service utilisation and expenditure trends, it sets the scene more clearly for the realist review and interview study by clearly articulating 'what' the existing workforce system challenges are as they relate to state funded contracted dental care in Ireland. The realist studies then deal with the 'why' and 'how' aspects of these challenges.

2.4.1 Documentary and secondary data analysis: methods and data sources

This study (chapter 3) takes a long, historic view of the Irish primary oral healthcare system and its evolution since the early 1950s and provides an overview of system population coverage, and workforce characteristics and trends over a 15-year period utilising available indicators. To date there have been very few primary research studies conducted which detail the historic perspective of the Irish oral healthcare system and the workforce (McAuliffe et al., 2022). The study has two arms: a documentary analysis and secondary data analysis (Figure 4). Documents and other data were identified through online searching of publicly available sources outlined in chapter 3 (with some missing data kindly made available by the HSE).

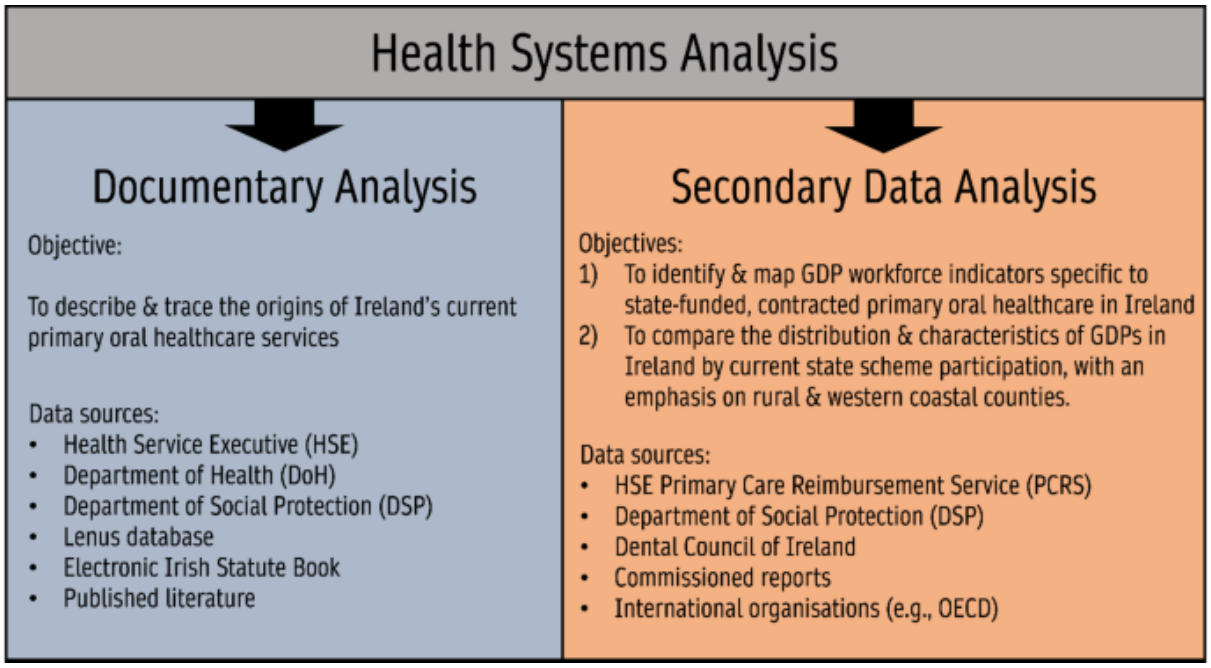

Figure 4: Study one: over-arching methodology

2.4.2 Documentary analysis

Documentary analysis in this thesis is used to describe and trace the origins of Ireland's current primary oral healthcare system. Bowen (2009) defines documentary analysis as the *"systematic procedure for reviewing or evaluating documents—both printed and electronic (computer-based and Internet transmitted) material"* and involves *"skimming (superficial examination), reading (thorough examination), and interpretation"* of document contents (Bowen, 2009). As a methodological approach, documentary analysis is well suited to qualitative case studies, this is, studies which produce rich descriptions of events, programmes or organisations. Documentary analyses can draw on a wide range of published and grey literature data sources including

scientific articles, books, reports, public records, manuals, press releases and published media (Burrell & Gross, 2017).

For this study, I drew upon a range of documents identified through desktop searches of various websites outlined in more detail in chapter 3 including the HSE and the Lenus database (the Irish Health Research Repository). There were no limitations placed on year of publication however as this analysis focuses on narrow area within the Irish healthcare system, I was able to review only a select range of documents sufficient to address the research objective - a recognised approach in documentary analysis (Dalglish et al., 2020). Selected documents were collated and analysed in the style described by Bowen (2009) and Dalglish et al. Bowen describes the method of documentary analysis as *'finding, selecting, appraising (making sense of), and synthesising data contained in documents. Document analysis yields data - excerpts, quotations, or entire passages - that are then organised into major themes, categories, and case examples specifically through content analysis'* (Bowen, 2009). Known as the 'READ' approach, Dalglish et al., describe this method as consisting of collating ('readying') documents; extracting data; analysing data and distilling findings (Dalglish et al., 2020). Regarding the analysis, Dalglish further describe the process as follows: *'As in all types of qualitative research, data collection and analysis are iterative and characterized by emergent design, meaning that developing findings continually inform whether and how to obtain and interpret data. In practice, this means that during the data extraction phase, the researcher is already analysing data and forming initial theories—as well as potentially modifying document selection criteria. However, only when data extraction is complete can one see the full picture'* (Dalglish et al., 2020).

2.4.3 Secondary data analysis

The second, and more substantive arm to the first study is a secondary data analysis (SDA), also referred to as 'secondary data research' (Tight, 2019), which was used to identify and map GDP workforce indicators specific to state-funded, contracted primary oral healthcare in the Irish context and to compare the distribution and characteristics of GDPs in Ireland by current state scheme participation, with an emphasis on rural and western coastal counties, highlighted in *Smile agus Sláinte* as lacking in dentists (Department of Health, 2019). Secondary data analysis (SDA) entails the use of data collected or created by a third party to carry out research with a different purpose to the original study (Wickham, 2019). Data used in SDAs may be available in publicly accessible repositories or archives and/or made available through data sharing agreements with third parties, as was the case in this research (Wickham, 2019). As a methodological approach, SDA comes with several benefits, namely the elimination of logistical obstacles that might be associated with primary data collection (Trinh, 2018). Indeed, for this

study, I had originally considered primary data collection by undertaking a cross-sectional survey of a sample of GDPs working in Ireland. I found, however, that many of the indicators I had planned on capturing in the survey (e.g., years qualified, contracts held, practice location etc.) were available via three publicly available datasets (see section 2.4.3.1 below and 3.6.2 in chapter 3). The use of this data therefore not only afforded me efficiencies, for example, time saving, it meant I was not hampered by a potentially low response rate, which can be a challenge in health services research (Booker et al., 2021). For this analysis, I utilised the WHO Dimensions of health workforce coverage ('AAAQ') framework as my conceptual framework and to identify key data related to GDP workforce indicators in Ireland over a 15-year period from 2008 to 2023 (Campbell et al., 2013). I expand upon the conceptual framework and relevant workforce indicators in chapter 3.

2.4.3.1 SDA data sources

Like the documentary analysis arm, I drew upon a range of documents and data sources identified through desktop internet searches of various websites to identify relevant GDP workforce indicators (outlined in chapter 3 below). These included the Dental Council of Ireland register of dentists, HSE Primary Care Reimbursement Service (PCRS) meta data on DTSS contractors and Department of Social Protection (DSP) list of DTBS contractors. These formed key pillars of the analysis of contractors owing to the breadth of combined indicators available within these datasets. The Dental Council of Ireland collects and publishes GDP registrant data (name, year and place of qualification) on an annual basis as part of its registration process. It maintains the register of dentists in Ireland in accordance with the Dentists Act (1985). The register is freely available on the Dental Council website (Dental Council of Ireland, 2023). The DSP maintains a list of all DTBS contractors and practice addresses on its website which the public can access to find a dentist in their locality (Department of Social Protection, 2023c). The DSP does not state how they collect this data. The HSE collects GDP data during the DTSS contract application process (HSE Primary Care Reimbursement Service, 2020a). It maintains and publishes a list of contractors on the PCRS Online Services website which is publicly available and downloadable as an Extensible Markup Language (XML) spreadsheet (Health Service Executive Primary Care Reimbursement Service, 2023). For the analysis of number of DTSS contractors, claims and payments nationally, data were accessed from two sources: the HSE's Annual Statistical Analysis of Claims and Payments Reports which were available online for the years 2008 to 2022 respectively and the PCRS Annual Reporting Menu (HSE Primary Care Reimbursement Service, 2023b). Data relating to the number of GDPs submitting claims on the DTSS were not published in HSE Annual Statistical Reports after 2018. To fill this gap in this missing data, I contacted the HSE

PCRS directly by email and they kindly made this information available to me in tabulated form (Appendix 1). Further information regarding data sources and the specific methods applied in the SDA are elaborated on in chapter three, section 3.5.2.

2.4.4 Justification for documentary and secondary data analysis

Study one does not seek to provide a workforce 'plan' for Ireland's primary oral healthcare system, but rather it seeks to outline more clearly the existing workforce challenges which exist within Ireland's state funded primary oral healthcare system, therefore providing a 'diagnosis' for the problem under investigation in this thesis, that is, private GDP engagement, more specifically, non-engagement in state funded, contracted primary dental care. Furthermore, it sets out to understand what the characteristics of GDPs are based on scheme participation. By 'painting a picture' of Ireland's primary oral healthcare system and demonstrating the existing workforce challenges in state-funded, contracted care, it sets the scene and acts as a springboard for the two realist studies by clearly framing the problem under investigation in the Irish health system and the policy context. In the discussion and conclusion chapter (chapter 6), I will demonstrate how the findings of the documentary and secondary data analysis relate to and are juxtaposed against the findings of the Ireland-focussed realist interview study (detailed in section 2.5 below), namely with respect to contextual factors related to GDP engagement in state funded care and outcomes.

2.5 Realist review and realist interview study

Studies two and three (chapters four and five) of this PhD thesis are a realist review (or realist synthesis) and realist interview study respectively. Having outlined clearly, in study one, *what* the problem under investigation is in the Irish context, studies two and three focus on developing explanations for *how* and *why* challenges relating to GDP participation in state funded care arise, from both an international and Irish health systems' perspective. More specifically, these studies seek to understand *how, why, for whom* and *under what circumstances* do health system factors influence private GDPs' engagement in state funded, contracted primary oral healthcare.

While there are different traditions or 'schools' of realism, the overarching research paradigm for these studies is 'scientific realism', as described in the school of Pawson and Tilley (Pawson & Tilley, 1997). In this section, I outline the aims of realism and why this is a suitable approach to addressing complex areas of inquiry, for example workforce challenges in health systems. I explain the ontology and epistemology behind realism and delve into the concept of generative causation which underpins the philosophy. I further explain key terms utilised in Pawson and Tilley's school of realism, namely contexts, mechanisms and outcomes, and the concept of Context-Mechanism-Outcome configurations (CMOCs) and realist programme theory.

2.5.1 Aims of realism

In realist-focussed research, the inquiry is often framed as: *'what works, for whom, under what circumstances, how and why?'*(Pawson & Tilley, 1997). However rather than trying to provide a definitive conclusion or judgement on what works (or what happens, as might be the case might be for a phenomenon or problem under investigation) or derive an effect size within a confidence interval, realism's focus is explanatory and on theory building. Realist-informed research aims to understand and unpack unobservable mechanisms that influence how interventions or 'programmes' work and understand the relationships between observable contexts ('C'), mechanisms ('M') and outcomes ('O')(Duddy & Wong, 2023). Realist studies are therefore well suited to investigating complex areas of inquiry, for example, health interventions, health policies and, in the case of this PhD thesis, health system challenges (Wong, 2018c). Health systems are often described as complex open systems comprising multiple actors undertaking a range of activities across different settings and whose outcomes are context-sensitive (Wong, 2018c). Due to their complexity, health systems often struggle to function efficiently due to factors such as high service demand, constrained financing and resourcing, structural rigidity and inertia, and weak governance (Kalaris et al., 2023). Most interventions required for health systems strengthening therefore are equally complex in nature (Sheikh et al., 2011).

As highlighted above, realist approaches are well suited to investigating complex interventions or, in the case of this thesis, complex social systems such as health systems which comprise a multitude of policies, organisations, structures and individuals interacting with one another at various levels, producing both intended and unintended outcomes (Wong, 2018c). As demonstrated by the WHO 'Building Blocks' framework, health systems are, by their very nature, internally complex with multiple 'moving parts'. These include a suitably trained workforce, appropriate guidelines and governance, supply chains, suitable healthcare facilities needed to care for patients, appropriate public health interventions and robust information systems, all backed by political, resource and financial commitment and good relationships between system actors (Daniels, 2018). The success of one part of the health system is highly dependent on, and sensitive to other parts of the system, for example, a clinical service is dependent on financing, workforce, supplies etc (Daniels, 2018). Health system actors, namely health policymakers, leaders, managers, healthcare workers and communities interact with, and influence each of these moving parts, thus impacting on the functioning of the health system. Even though they do not have full control over any individual moving parts, or the whole system itself, system actors do have agency, and therefore they can trigger and inform system change through their ideas, different choices they make (volitions) and their subsequent actions. For the purposes of this thesis, the two realist studies are designed to explain the influence of context on outcomes in a complex social system (highlighted in study one) and therefore identify potential solutions for a health systems problem, rather than investigate the effectiveness of a health intervention, service or policy *per se* (Duddy & Wong, 2023).

2.5.2 Ontology and epistemology

Realism in the school of Pawson and Tilley finds its ontological origins in the 'father' of realism, Roy Bhaskar's earlier critical realism (CR) work which posits that the 'real' world cannot be observed, but rather exists independent of human's perceptions, theories, and constructions ('mind independent' reality) (Bhaskar, 2013). According to critical realists, our understanding of the world is constructed from our experiences and perspectives by what is 'observable', however it is the *unobservable* structures that lead to observable outcomes or events. Therefore, the social world can only truly be understood if we understand the structures that generate these events. As a scientific philosophy, Pawson and Tilley assert that 'realism' sits between positivism and constructivism (Pawson & Tilley, 1997). Positivism contends that *'there is a real world which we can apprehend directly through observation'*(Wong et al., 2012). In other words, ontologically, the things we experience as human beings are objectively what exists in reality, and it is the job of researchers (epistemologically speaking) to substantiate this experience through scientific

deduction (Wainwright, 1997). Conversely, constructivism argues that *'given that all we can know has been interpreted through human senses and the human brain, we cannot know for sure what the nature of reality is'* (Wong et al., 2012). That is, all knowledge is individually and socially constructed and interpreted by humans. Constructivism's focus therefore is on understanding the meanings and actions of individual people and their interpretations of the world (Wainwright, 1997).

Pawson and Tilley describe scientific realism not as a method *per se* but rather a *'methodological orientation, or a broad logic of inquiry that is grounded in the philosophy of science and social science' and 'a tool for understanding how social programmes work and . . . a framework for understanding their complexity'* (R. Pawson, 2006). Pawson and Tilley regard realism as the *'principal post-positivist perspective, whose place is at the centre of things where it steers a path between empiricist and constructivist accounts of scientific explanation'* (R. Pawson, 2006). Pawson and Tilley's scientific realism therefore comes with its own epistemology and ontology and holds several defining features (Westhorp, 2018). Realism subscribes to the idea of generative causation, rather than successionist causation, which traditionally underpins clinical trials, i.e., experimental intervention (cause) 'X' leads to outcome (effect) 'Y' (Ray Pawson et al., 2005; Wong, 2013). Successionists hold a view that while causation cannot be directly observed, it can be inferred based on the observation of sequences of events, often occurring together, and with some regularity (Westhorp, 2018). By this logic, in randomised controlled clinical trials (RCTs), the aim is to 'control' a sequence of observations in order to differentiate between causation and association. In other words, by designing an experiment where the sole difference between the 'control' group and the 'intervention' group is the treatment itself, it *infers* that any resulting changes or outcomes that arise are attributable to *that* treatment or intervention (Pawson, 2008). While traditional RCTs can determine *what* effect interventions can have using statistical variables, they cannot always identify the reasons as to *how* or *why* these did or didn't work and therefore the generalisability of their findings may be limited (Van Belle et al., 2016). This is often due to the complexity of such interventions, for example public health interventions like smoking cessation services, and the number of non-linear, interacting components and other variables within the experimental and control interventions which can influence outcomes (Craig et al., 2008). RCTs also struggle to capture the nuances of human agency and behaviours, for example the degree to which participants decide to engage or comply with an intervention and the individual choices they may make while taking part in such an intervention (Van Belle et al., 2016).

Generative causation holds that to infer causation between two events ('X' and 'Y') there is a need to understand the underlying, unobservable mechanisms connecting them and the context in

which this is happening (Ray Pawson et al., 2005). Realists argue that these hidden mechanisms (for example, human reasoning, perceptions or the development of a new skill) which are difficult to measure or account for in traditional study designs like RCTs, are key to understanding why interventions are successful (or why outcomes occur) in some instances, but not others. Additionally, realists believe in mind-independent reality and argue that because our observations of the world are filtered through, and interpreted by the human brain, our perceptions of reality are inherently fallible and can only ever be partial (Jagosh, 2019). Scientific realist epistemology therefore maintains that there can be no 'final' truth or knowledge, however, we can gain a partial understanding of the world and continually expand our knowledge through the development and testing of theories (Williams, 2018).

2.5.3 Realist concepts and terminology

In the following sub-section, I highlight several key concepts and terms used in realist studies.

2.5.3.1 Programme theory

A realist programme theory is an abstracted description of what an intervention comprises and how it is anticipated to work, or as is the case in this thesis, the process by which outcomes within an phenomenon of interest are believed to arise (Greenhalgh T, 2017). Programme theories help make sense of the workings of complex interventions or phenomena and are often presented as narrative descriptions and/or represented diagrammatically (Duddy & Wong, 2023). They are expressed as CMOCs (and the interactions between different CMOCs) and are generally presented as 'middle range' theories, that is, according to Robert K Merton, where they are abstracted but are *"close enough to observed data to be incorporated in propositions that permit empirical testing"* (Merton, 1968). In other words, they are theories that are at the correct level of abstraction to be both 'useful' and 'testable'. Programme theories may be informed by formal, substantive theories which can furnish researchers with pre-existing knowledge or research on a topic and useful frameworks for understanding phenomena under investigation more clearly, for example Bandura's Social Learning Theory or Merton's Reference Group Theory (Greenhalgh T, 2017). Formal theory can also be useful in identifying mechanisms and contexts and making sense of CMOCs, however their use in realist studies is not mandatory (G Wong et al., 2013). Realist studies begin and end with programme theory. The starting point for realist reviews, realist evaluations and realist interview studies are an 'initial programme theory' (IPT) (Duddy & Wong, 2023). An IPT is a preliminary understanding of how an intervention works or a phenomenon occurs and may be informed by background reading of the literature, and/or the expertise of research stakeholders. As realist studies progress, data collected are utilised to confirm, refute and refine the IPT into an evidence-informed, realist programme theory. Realist studies conclude

with a refined, overarching or 'final' programme theory (FPT) which is developed from CMOCs and provides a realist causal explanation for outcomes under investigation (Duddy & Wong, 2023).

2.5.3.2 Context-Mechanism-Outcome Configurations

Development of realist programme theory commences with contexts, mechanisms and outcomes, which must be configured into explanatory statements referred to as 'context-mechanism-outcome configurations' or 'CMOCs'. According to Pawson, a CMOC is 'a hypothesis that the programme works (O) because of the action of some underlying mechanism (M), which only comes into operation in particular contexts (C)' (Pawson, 2013). CMOCs are therefore vessels for highlighting generative causation through the relationship or interconnections between each constituent part of configurations. This is known as realist logic of analysis and is rendered as 'C + M = O' (Wong, 2018c). What follows are individual explanations contexts, mechanisms and outcomes.

2.5.3.3 Contexts

In scientific realism, the term 'context' does not necessarily refer to a *physical* environment or setting such as healthcare facility, as one might infer (Pawson & Tilley, 1997). Instead, context means any circumstance in which a phenomenon or an intervention under investigation takes place (Pawson & Tilley, 1997). Contexts are any conditions that trigger or modify the behaviour of mechanisms to generate outcomes of interest. Because individuals respond differently to different programmes and have different reasoning which might be influenced by their characteristics such as their gender, the same programme may succeed (or phenomenon play out) in one setting, but not in another. The aim of realism, therefore, is to understand what it is about the functioning of contexts in particular settings that influence whether programmes work or not (or why certain phenomena occur). The term can be applied to ***I****ndividuals* engaged in a programme (and their characteristics); the ***I****nterpersonal* relationships between stakeholders; the ***I****nstitutional* settings in which programmes play out (and their norms and customs) and the wider societal, economic and cultural settings of programmes (the *'**I**nfrastructure'*). Pawson refers to these as the *'four **I**s'* of context in realism (Pawson, 2013).

2.5.3.4 Mechanisms

Mechanisms are the underlying generative processes which bring about certain outcomes when activated in the right context (Pawson & Tilley, 1997). They are the key agents of change in realism and are ordinarily descriptions of the reasoning and behaviours of individuals or participants involved in a process or intervention and how they respond to specific contexts in which they exist (Lacouture et al., 2015). According to Astbury and Leeuw, mechanisms are 'underlying entities, processes, or structures which operate in particular contexts to generate outcomes of interest'

(Astbury & Leeuw, 2010). They suggest that mechanisms hold three key characteristics, namely, they are 1) usually hidden; 2) sensitive to variations in context and 3) they generate outcomes (Astbury & Leeuw, 2010). In contrast to empiricist thinking that what is observed is what is 'real' (and therefore things that cannot be observed cannot be 'real'), realist thinking holds that while they are hidden, mechanisms *are* real and are key to understanding how the world functions because they and have dispositional tendencies to exert causal effects through their interactions with other things existing in the real world, therefore resulting in events which can be observed empirically (Brönnimann, 2022).

2.5.3.5 Outcomes

Outcomes are the intended and unintended consequences which result from the activation of different mechanisms in different contexts. Outcomes can be intermediate ('proximal') or final ('distal') and typically occur in semi-predictable patterns and with some regularity however this is not always the case as there are endless variations possible within the social world (R. Pawson, 2006).

2.5.4 Realist reporting standards

For the realist review (study two), I adhered to Realist And Meta-narrative Evidence Syntheses: Evolving Standards for realist syntheses publications (RAMESES I standards) (Geoff Wong et al., 2013). While there are no formal publication standards for realist interview studies *per se*, I was guided by the reporting standards for realist evaluations (RAMESES II standards) for study two (Greenhalgh et al., 2015). Realist interview studies share many of the same methodological characteristics as realist evaluations, namely the use of primary data gathered through interviews. The RAMESES I and II standards outline the items that should be included in realist publications. The aim of the RAMESES project is to produce high quality publication standards and training materials for studies adopting realist approaches (The RAMESES Projects, 2013).

2.5.5 Operationalising realist approaches

In this section I provide an overview of the process involved in undertaking in scientific realist studies. This will give a sense of how the philosophy and principles outlined above are applied in this methodological approach.

2.5.5.1 Iterative research approach

Realist research in the school of Pawson and Tilley is undertaken iteratively as demonstrated in Figure 5 (realist review) and Figure 6 (realist interview study – adapted from realist evaluation). As outlined above, realist studies start and end with the development of programme theory. Development of an initial programme theory (IPT) is informed by prior subject knowledge of

research team members, background informal reading of published and grey literature, and consultation with subject experts and stakeholders with experience in the area under investigation (Duddy & Wong, 2023). Thereafter, data can be gathered either by primary data collection (as is the case in realist interview studies or evaluations) or by systematic searching of published (and grey) literature as is the case in realist reviews. For realist reviews, data are then selected and then for both realist reviews and interview studies these are analysed. For this thesis, the analyses were undertaken using NVivo 12 Plus qualitative analysis software using both inductive and deductive coding. Following coding, the data are then synthesised by constructing explanatory CMOCs and building programme theory to explain causation. The last step is then theory refinement and abstraction to a higher level whereby it may be applied to different contexts (Pawson & Tilley, 1997; R. Pawson, 2006).

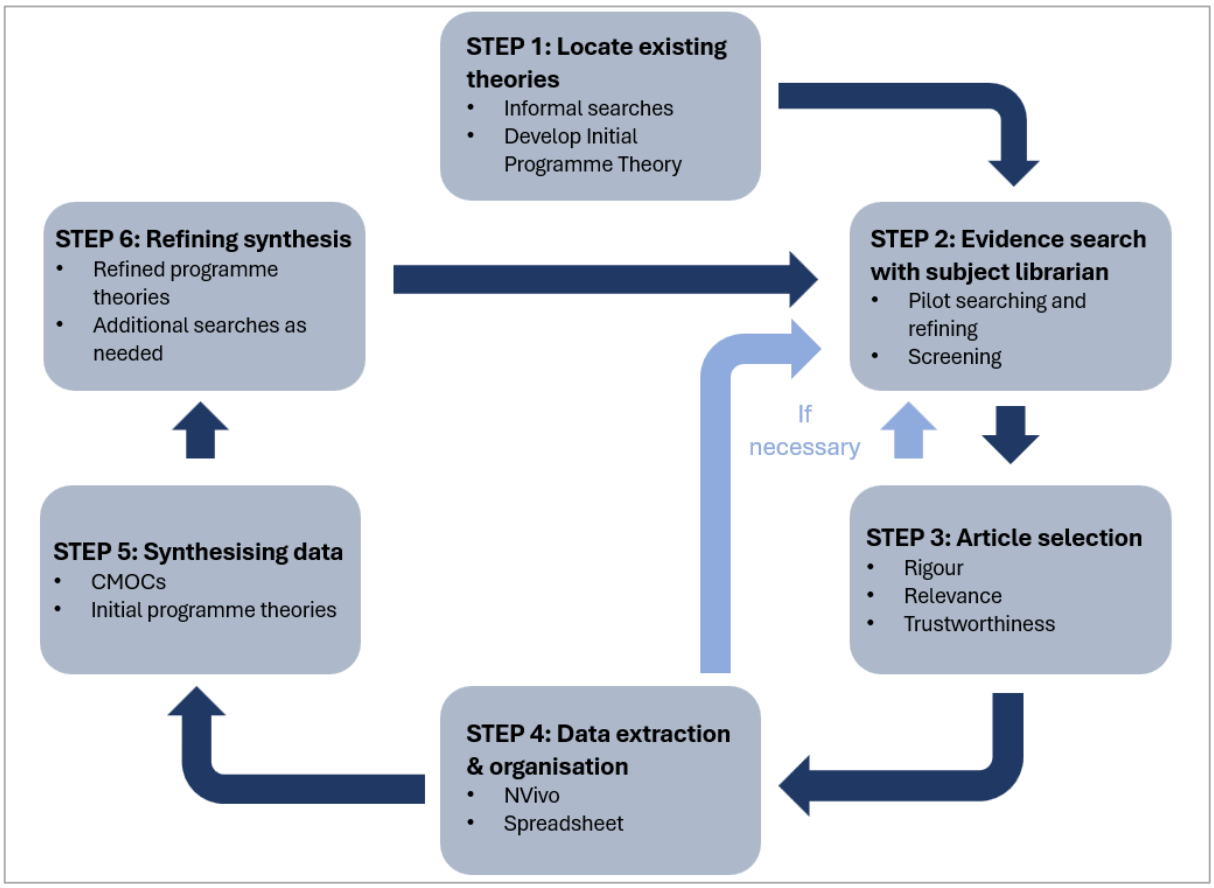

Figure 5: Stages of a realist review

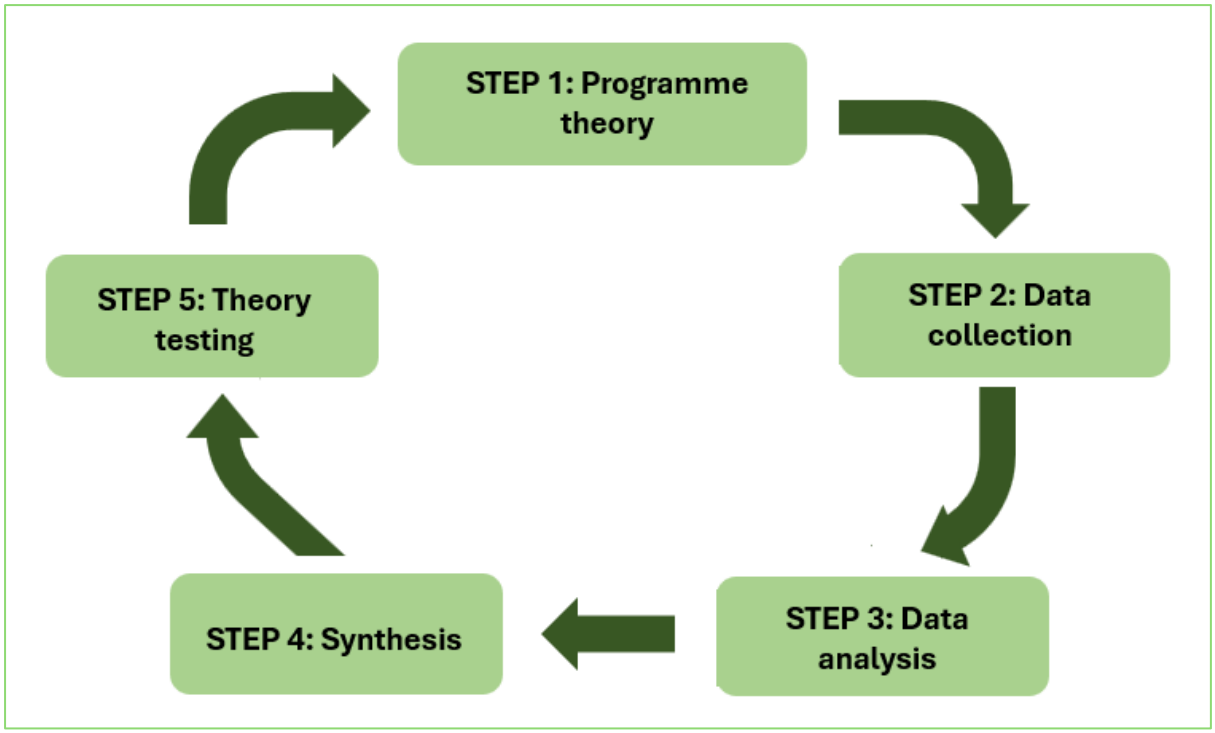

Figure 6: Stages of the realist interview study

The above description depicts a rather linear and step by step approach to realist studies however in reality, the process is less linear as indicated in Figure 5 (realist review). During realist studies, it is not uncommon for researchers to revisit previous steps, for example to find additional data where gaps in the literature are uncovered during the analysis phase or to re-code data during the synthesis phase (should a new and significant subset of findings emerge). In contrast to systematic reviews where the aim is to find all data pertinent to an area of investigation, realism offers a flexible and agile methodological approach where the focus is on the production of meaningful theory (Booth et al., 2020). Furthermore, the iterative nature of realist approaches means that as new concepts emerge during the process, these can inform the subsequent direction of analyses. Realist reviews share similarities with systematic reviews, namely the systematic nature of database searching in the early phases of the research. Unlike systematic reviews however, later rounds of searching may be more targeted at identifying relevant studies or grey literature sources needed to fill gaps in the data already collected (Booth et al., 2020). Realist reviews are a configurational rather than an aggregative form of evidence synthesis, therefore they are not intended to be exhaustive in their collection and synthesis of data in a relevant topic area (Duddy & Wong, 2023). As their focus is on the production of theory, the units of analyses in realist reviews are not individual segments of data, but the theory itself that is constructed around many bits of data. According to Dey (1999), the point at which the researcher has gathered enough data of 'conceptual depth or density' to inform the development of emerging theory and where the

gathering of any additional data will not enlighten any new insights is referred to as 'theoretical sufficiency' (Dey, 1999).

2.5.5.2 Data sources

The data utilised in scientific realism can come from primary research studies which have adopted both qualitative, quantitative or mixed methods. In contrast to systematic reviews, realist reviews can and often do utilise data from other sources of literature (out with published scientific literature), for example grey literature such as reports, websites and other documents which can provide useful contextual and mechanistic-rich data about a given intervention or phenomenon of interest (Wong, 2018a). The inclusion of data from different sources, including grey literature which may be perceived as less reliable or methodologically less robust compared to peer-reviewed literature can be a challenge in realist studies, namely realist reviews, and therefore they require different treatment. According to Pawson, it is not the whole document or data source that requires quality appraisal (as would be the norm in systematic reviews) but rather an assessment of whether it can yield potentially useful pieces of explanatory data which might inform the development of realist theory around causation (Ray Pawson, 2006). As most research is not carried out from a realist perspective, there is unlikely to be information within studies that specifically or explicatively relates to contexts or mechanisms or outcomes *per se*. It is the job of realist researchers to extract and utilise available segments of data for the purposes of theorising and building CMOCs and programme theory. Pawson further explains that only by doing the analysis can it become clear whether or not a section of data can be useful or not to that particular realist review and therefore it's quality assessed (Ray Pawson, 2006).

There are no specific tools or checklists for quality appraising or grading studies in realist reviews. Instead, quality appraisal focuses on assessing the 'relevance' and 'rigour' (trustworthiness) of data sources. In common with other review types, 'relevance' refers to the usefulness of data in addressing the topic or review objectives as laid out in the inclusion/exclusion criteria for selection, and ability to advance theory building (Dada et al., 2023). 'Rigour' as defined in the RAMESES standards relates to *'whether the method used to generate that particular piece of data is credible and "trustworthy"'* (Wong et al., 2014). In practice, this might relate to a study's sample size, techniques for data collection and analysis and claims arising from research (Pawson et al., 2004). A third domain, conceptual 'richness' (or 'thickness') pertains to the degree of theoretical and conceptual development within data that explains how, why, and for whom an intervention is anticipated to work or phenomenon occurs (Dada et al., 2023). In other words, are data sufficiently detailed (or rich) to meaningfully contribute to the development of realist theory. Booth et al., (2013) expand on this further by explaining that conceptual 'thickness' requires enough

detail to allow the reader to establish what is taking place in both the intervention (or phenomenon) and the wider context and infer whether or not the findings are transferrable to other people, places, situations or environments (Booth et al., 2013).

In this PhD thesis, data for the realist review (chapter 4) come from published and grey literature while data for the realist interview study (chapter 5) come from primary data collected through one-to-one realist interviews with oral healthcare system actors based in Ireland and elsewhere.

2.5.5.3 Data analysis and programme theory building

The aim in realist-focussed research is to create, test and refine programme theory, therefore realist researchers need to use a theoretical lens through which to undertake the analysis, focussing on whether pieces of data, gathered from multiple sources, can enlighten causal explanations. Researchers must then decide what component of the CMOC causal pathway each segment of relevant data aligns with (i.e., context (C), mechanism (M) or outcome (O)), and how to configure these with other pieces of data (R. Pawson, 2006). Depending on the nature of the realist study, analysis will vary based on whether theories are being built in a new area of investigation or are being tested with respect to specific programmes or interventions, for example to evaluate how they work (R. Pawson, 2006). In the case of this PhD, both realist studies are theory building studies and therefore are flexible in how they build their sets of explanations. The process of building programme theory is an iterative one whereby researchers refine (or indeed refute) initial CMOCs using additional data as required. Thereafter, CMOCs are consolidated into programme theories and abstracted to a higher level.

In chapters four and five of this thesis, I describe the processes through which I developed CMOCs and programme theory as part of the realist review and realist interview study analyses.

2.5.6 Rationale for using a realist approach

As outlined in section 2.5.2 above, realism in the school of Pawson and Tilley offers an alternative to both positivism and constructivism and therefore it was deemed appropriate for addressing the objectives of this thesis. Duddy and Wong state that scientific realism is suited to developing useful explanations for how and why things happen (or not) and is therefore useful for 'diagnosing' problems in complex systems such as health systems (Duddy & Wong, 2023). Recruitment and retention of healthcare professionals across all disciplines and specialties has long been recognised a 'wicked problem' in health systems which requires complex solutions (Humphries et al., 2019; World Health Organization, 2022b). Solving these challenges rarely entails a single 'silver bullet' intervention but necessitates a deeper understanding of complex whole system factors and how these influence the behaviour of the system and aspects of it, including the

workforce. Indeed, the RAMESES II standards explicitly state that 'wicked problems' in contemporary health services research, for example, how to improve quality or meet increasing needs within a limited budget require *"complex delivery programmes with multiple interlocked components that engage with the particularities of context"* (Greenhalgh et al., 2015). In healthcare workforce planning, researchers and policymakers are increasingly adopting a 'systems thinking' approach which considers the various complexities, feedbacks and delays between decision making and change implementation (Brocklehurst & Tickle, 2012; Masnick & McDonnell, 2010). Recognising the limitations that exist with long established traditional health workforce planning models, namely 'stock and flow' (of personnel) (Masnick & McDonnell, 2010) and the demographic approach (population demand) (Birch et al., 2009), some have argued that there is a need to link clinical workforce planning to health and healthcare dynamics. Regarding workforce recruitment and retention in dentistry, in their 2012 paper, Brocklehurst and Tickle adopted a 'systems thinking' approach to develop an oral health workforce planning tool. This considered the various interactions, delays and feedbacks that influence the balance between the various components of the health system (Brocklehurst & Tickle, 2012). Building upon earlier work by Masnick and McDonnell (2010), they examined the complex interactions between factors on the demand and supply side of care in the NHS and suggested that the net flow of dentists in the system was dependent on a myriad of complex and interlocking factors including the right legislative environment and contractual arrangements, financial support and incentives, and market forces driven by people expressing a need for care (Masnick & McDonnell, 2010). From a policy perspective, the use of the private sector workforce may be viewed as an efficient means of creating clinical capacity within health systems (Hellowell, 2020), however models of contracting primary dental care rely on a steady supply of GDPs voluntarily opting into or remaining in such services. In contrast to directly operated state funded salaried dental services (O'Selmo et al., 2020), general dental practices operate as businesses where capital assets and staff are held and managed outside the state system, within the private sector (Brocklehurst et al., 2016).

Unlike traditional research methods, such as systematic reviews, realist methodological approaches such as realist reviews seek to produce findings which are of more relevance and use to health policy makers (Wong, 2018c). This is because realist studies have the potential to enlighten causal explanations for complex problems by providing in-depth explanations of when different contextual factors lead to variations in outcomes.

2.6 Evolution of planned PhD research workstreams

When I commenced this PhD, I originally planned on doing a scoping review to identify factors influencing GDPs' participation in state funded primary care services. Scoping reviews are a form of evidence synthesis useful for ascertaining the breadth and depth of knowledge on a topic through searching the published literature (Munn et al., 2018). They are useful for identifying gaps in knowledge and to inform further evidence syntheses, for example systematic reviews. While a scoping review would no doubt have proved useful in identifying *what* factors influence GDPs' engagement, it would not have delved deeper to uncover the *how, why, for whom,* or *under what circumstances* these factors influence participation. Indeed, two 'big picture' reviews by Evans et al. and Holloway and Chesnutt were published in 2024 which uncovered many of the same factors outlined in my realist review (in the UK context) (D. Evans et al., 2023; Holloway & Chestnutt, 2024). These reviews did not however provide an in-depth appraisal of the health system level factors at play or delve into the *how or why* as outlined above. The scoping review in this PhD was to be followed by qualitative interviews with elite system actors embedded in the Irish oral healthcare system and a stakeholder workshop with a view to elucidating further factors. This planned study was to be based on the 'Systems thinking and modelling' methodological framework designed by Cavana and Maani (Cavana & Manni., 2000), and the 'Horizon Scanning' component of the Robust Workforce Planning (RWP) Framework developed by the UK Centre for Workforce Intelligence (Centre for Workforce Intelligence, 2014). Similarly, for my third work package I had originally examined the possibility of undertaking a study using participatory Group Model Building (GMB) as a qualitative and systematic method for developing a systems 'causal loop' model to identify and represent the system forces shaping GDPs' engagement in state funded care in Ireland (Muttalib et al., 2021). However, owing to the absence of methodological expertise in these areas within my PhD supervisory team (and the wider TCD Centre for Health Policy and Management where I am based) and a change in my primary supervisor at the start of my 2nd year (to someone who was well versed in realist methods), these work packages evolved to become a realist review and realist interview study as described in chapters four and five respectively. It was felt by both me and my supervisors that a realist review and realist interview study were good 'fits' for the overarching PhD aim and study objectives and offered ideal alternatives to the above methodological approaches. In 2023 I attended a five-day realist methods training course delivered by Geoff Wong and Claire Duddy at the University of Oxford, UK. As already outlined in section 2.2.6, I undertook secondary data analysis in lieu of primary data collection through GDP surveys owing to the availability of relevant workforce indicators via public repositories.

2.7 Ethical approval

Ethical approval was not required for the documentary and secondary data analysis or realist review as these utilised secondary data or published literature which were freely available online (with some additional anonymous data kindly made available by the HSE). Results for study one, specifically the secondary data analysis were presented in aggregated and anonymised formats. I received ethical approval for the realist interview study via the Trinity College Dublin Centre for Health Policy and Management/Centre for Global Health Research Ethics Committee on 30/10/2024 (REAMS No: 1926) (Appendix).

2.8 My positionality

I am a primary care dentist who trained and worked in the National Health Service (NHS) in a variety of settings across Scotland and England over a 16-year period from 2003 to 2019. During this time, I also worked alongside senior healthcare policymakers at NHS Health Education England (HEE) (now NHS England Workforce, Training and Education (WTE)) - a non-executive arm of the UK Department of Health and Social Care (DHSC) developing oral health workforce policy as part of the Advancing Dental Care (ADC): Education and Training Review Programme (Health Education England (HEE), 2021). My time working in HEE was especially formative in my career, as it was my first non-clinical role and one which engendered a passion for workforce and policy, leading me to undertake this PhD. I had the good fortune to work alongside senior health policy makers across the UK's oral healthcare system on a project that was focused on building a robust dental education infrastructure and oral health workforce for England. Notwithstanding its many flaws, the NHS strives to offer universal health coverage to all citizens - men, women, children, the rich and the poor. While NHS primary care dentistry may not be free at the point of use for most adults, services are comprehensive, and eligibility extends to all. Notably, care is free at the point of use for all under 18 year olds and those on low incomes in receipt of income support.

When I moved back to Ireland in late 2019 to work as a salaried dentist in the HSE Oral Healthcare Service (then Public Dental Service), I was struck by the vast oral health inequities that exist here, especially among young children who do not have universal access to publicly funded primary oral healthcare (McAuliffe et al., 2025). Driven by a historical absence of political priority and support for oral health coupled with a system of care delivery which I perceive to be outdated, these inequities see many of our most vulnerable citizens go without even the most basic preventative and curative dental care (McAuliffe et al., 2022). In my time working in the HSE OHS, I would frequently encounter an eight- or nine-year-old child presenting with acute oro-facial pain or infection due to untreated dental disease. I was often the first dentist that child ever attended. To

try catching up on years of absent prevention and acclimatisation, before ultimately having to provide invasive, and often traumatic treatment in some form, was often exasperating, heart-breaking and a cause of much professional and personal discomfort to me.

I want Ireland's oral healthcare system to do better. I want to be part of that process of betterment. While not perfect, I am supportive of *Smile agus Sláinte* and its proposed reforms. Cognisant of the significant challenges faced by the profession in recent years, especially regarding dentists' participation in state dental schemes, which I explore in this thesis, I want to see as many clinicians engaged in the public system as possible. If we are to see *Smile agus Sláinte* reach its full potential and the widening of access to timely and affordable dental care for our most vulnerable citizens, we need to encourage clinicians to engage in the public system and keep them there. That is what this thesis' research is all about.

I came to this PhD not only as an early career researcher, but as a frontline practicing clinician, an undergraduate educator, and someone who sits on Ireland's regulatory body for dental professionals - the Dental Council of Ireland. I am aware therefore, that these roles and my prior experiences outlined above mean I carry certain biases and hold positions that have the potential to conflict with or impact upon my research. Throughout my PhD, I remained cognisant of these biases, especially when interpretating and reporting on findings and when engaging with others, for example study participants, and when hearing about their experiences, their attitudes, beliefs, values and intentions. As a practicing dentist (albeit no longer in the public system) at times, I found this a challenge, especially when some of the issues or challenges brought up in the literature or in interviews mirrored my own experiences as a practicing dentist. On reflection however, I feel that by undertaking this PhD in the TCD School of Medicine (rather than the School of Dental Science) and therefore being surrounded by 'non-dentists', this allowed me to think more broadly in terms of the health system and health policy perspectives and not just in terms of clinical dentistry or oral healthcare. My own opinion is that dentistry can be a siloed profession therefore this PhD journey was a refreshing departure for me and one which I feel really pushed me to think beyond the bounds of my chosen profession. Something I really appreciated was my non-dental PhD supervisors keeping me 'in check' throughout - encouraging me to think at health systems level and from the perspective of the health system, not just frontline practitioners. As a frontline dentist whose opinions have been influenced not only by my own experiences practicing within public systems but the views of colleagues and friends, having these biases checked and challenged by those external to the profession was something I found to be of immense benefit to me throughout this PhD journey

During my PhD, I endeavoured to carry out this research as reflexively and ethically as possible so as not to influence participants or other stakeholders, for example data owners, based on my own biases or other roles held. Examples of how I mitigated against these conflicts included carefully designing my realist interview topic guide in alignment with the RAMESES realist interview guidelines and piloting this to ensure questions were as objective as possible and engaging with stakeholders through formal channels and with transparency (wearing my PhD 'hat'). Throughout this PhD, I consistently cross-checked my findings with a range of stakeholders including my supervisors and others to attenuate any potential biases. I engaged with a multi-disciplinary stakeholder (project advisory) group as part of my realist review and realist interview study. As part of that dialogue and engagement, I ensured stakeholders were given the opportunity to feedback and critique my findings and ideas. I expand further on my biases and reflexive practice in the final chapter of this thesis (chapter 6, Discussion and conclusion).

2.9 Chapter summary

In this chapter I have provided an overview of the documentary and secondary data analysis and how I am applying these methods in this thesis. I have outlined why I believe these approaches are useful and how this study acts to set the scene for the following two studies. I have also described realist methodological approaches in the school of Pawson and Tilley which I utilised in both the realist review and realist interview study. I have provided justification for the use of scientific realism in these two studies given that they are especially useful for diagnosing problems in complex systems such as health systems. I have provided an overview of scientific realism in the school of Pawson and Tilley, its ontology and epistemology and summarised key realist concepts such as contexts, mechanisms, outcomes and programme theory. I have also given an overview of how realist research is operationalised using an iterative approach to build theory.

Chapter 3 Study 1: Documentary and Secondary Data Analysis of the primary oral healthcare system in Ireland

Publication:

Primary oral healthcare in Ireland: a health systems analysis of publicly funded contracted services delivered by the general dental practitioner workforce

Paul Leavy[1], Pádraic Fleming[2], Blánaid Daly[3], Sarah Barry[4] and Sara Burke[1]

Author affiliations:

1. Centre for Health Policy and Management, Trinity College Dublin, Dublin 2, Ireland
2. Trilateral Research Limited, Waterford, Ireland
3. School of Dental Science, Trinity College Dublin, Dublin 2, Ireland
4. School of Population Health, Royal College of Surgeons in Ireland, Dublin 2, Ireland

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3.1 Chapter outline

This chapter will explore the first study of this thesis, a documentary and secondary data analysis of the private GDP workforce in Ireland which is contracted to provide publicly funded primary oral healthcare services on behalf of the state. This study was conducted in 2023/2024 and resulted in a publication*, "Primary oral healthcare in Ireland: a health systems analysis of publicly funded contracted services delivered by the general dental practitioner workforce"* in BMC Health Services Research (Leavy, Fleming, et al., 2025).

The body of text presented in this chapter is taken directly from the published article and therefore uses the term 'we' throughout when discussing the research process. I would like to clarify here that as is customary for multi-authored articles, it was composed on behalf of the team of authors and hence uses 'we' throughout. The team of authors comprised me and four of my current and former PhD supervisors. The majority of the research conducted in this study and all drafting was undertaken by me as first author with support and guidance provided by the rest of the team. Additionally, the published paper frequently refers to '*Smile agus Sláinte'* as the National Oral Health Policy – 'NOHP' and refers to the HSE (salaried) Oral Healthcare Service (OHS) as the 'Public Dental Service' ('PDS'), its former name.

As per Trinity College Dublin's PhD and Publication guidelines as laid out in the School of Medicine Postgraduate handbook, a copy of this publication is available in Appendix 23 (Published works).

3.2 Abstract

Background

In recent years, Ireland has seen a decline in the number of private general dental practitioner (GDP) contractors delivering state funded dental care. Meanwhile, the National Oral Health Policy – *Smile agus Sláinte*, proposes contracting more state funded care to private GDPs including care for all children and vulnerable adults. Understanding Irish GDP workforce characteristics will be key in evaluating services and informing workforce planning into the future. This study describes the primary oral healthcare system and GDP workforce indicators in Ireland and compares private GDPs by current state dental scheme participation.

Methods

Documentary analysis was used to describe and trace the origins of Ireland's current primary oral healthcare services. Secondary analysis of publicly available data was undertaken to map GDP workforce indicators to critical dimensions of the World Health Organization (WHO) 'Dimensions of Universal Health Coverage (UHC) relating to Human Resources for Health' framework. Private GDPs were compared by state dental scheme participation utilising available demographics. Descriptive statistics were computed using STATA/SE 17 software.

Results

Private GDP contractors have participated in the delivery of state-funded dental care in Ireland since the early 1950s. The number of private GDPs holding Dental Treatment Services Scheme (DTSS) contracts fell from 1,664 in 2016 to 787 in August 2023, while the number holding Dental Treatment Benefit Scheme (DTBS) contracts increased from 1,959 in 2016 to 2,384 in 2023. The number of private GDPs submitting claims on the DTSS has also declined from 1,318 in 2016 to 831 in 2022. DTSS contractors are more likely to be male and qualified longer (> 20 years) than GDPs holding only DTBS contracts.

Conclusion

These findings are very relevant and timely to the planned policy implementation given that *Smile agus Sláinte* is reliant on the greater provision of publicly funded care by private GDPs. There is a potential lack of GDP supply into the public system as the Irish Government seeks to implement *Smile agus Sláinte* and meet its WHO obligations on developing UHC for oral health.

Keywords Dentistry, Oral health, Workforce, Policy, Ireland

3.3 Background

To function adequately and ensure timely access to care for patients, health systems rely on the workforce, also known as 'human resources for health' (HRH)(Haakenstad et al., 2022). The workforce is recognised as one of the six 'building blocks' of health systems, alongside service delivery; information; medical products, vaccines and technologies; financing; and leadership and governance (Stockton et al., 2021). Recruitment and retention of HRH is a worldwide challenge and the World Health Organization (WHO) estimates that by 2030, there will be a shortfall of 10 million healthcare workers globally (World Health Organization, 2022b). Many factors are associated with HRH shortages including healthcare worker migration and a failure to invest in education and training (Byrne et al., 2021; World Health Organization, 2022b).

As members of the dental team, dentists, alongside other dental healthcare professionals (e.g., dental hygienists) play an important role in ensuring individuals achieve their optimal oral health and by extension, overall health and quality of life (QoL) (Sischo & Broder, 2011; Watt et al., 2014). Oral healthcare services are primarily delivered in primary care settings, namely private general dental practices and public dental services operated directly by state health authorities (Ziller, 2008).

In 2022, United Nations (UN) member states agreed to adopt the WHO's global strategy on oral health with an emphasis on developing universal health coverage (UHC) for oral health, reaching all communities by 2030 (World Health Organization, 2022a, 2022c). A strategic aim outlined in the WHO Draft Global Strategy on Oral Health (2022) is *"to ensure that there is an adequate number, availability and distribution of skilled health workers to deliver an essential package of oral health services to meet population needs"*. To deliver on this, health systems will need to enhance the capacity of their oral health workforce (Winkelmann, Gómez Rossi, et al., 2022). In Europe, some jurisdictions have already achieved partial or comprehensive UHC for oral health, most notably targeting children and other vulnerable groups (Winkelmann, Gómez Rossi, et al., 2022). There remains, however, widespread variability in levels of statutory dental care cover for the wider population with an estimated two thirds of care funded by 'out-of-pocket' payments or voluntary private health insurance in Europe (Winkelmann, Gómez Rossi, et al., 2022). Many health systems employ models of contracting state-funded dental care to independent, private general dental practitioners (GDPs) and their teams, for example, the National Health Service (NHS) across the United Kingdom (UK) (Brocklehurst et al., 2020; Nasseh et al., 2023; Winkelmann, Rossi, et al., 2022; Woods et al., 2017). Contracting with private providers is advocated for in the WHO Global Strategy and Action Plan on Oral Health 2023-2030 and is reliant

upon on a steady supply of dentists opting into and remaining in such schemes (World Health Organization, 2024).

3.3.1 Healthcare in Ireland

Ireland is a European Union (EU) member state located in western Europe. In 2023, the estimated population was 5.3 million, an increase of almost 100,000 on 2022 (Central Statistics Office, 2024b). Ireland's population is projected to increase by between 500,000 and 1.8 million by 2057 owing to natural increase and net inward migration (Central Statistics Office, 2024c). Ireland's population is ageing, with the proportion aged 45 and over increasing from 35.5% in 2013 to 40.6% in 2023 (Central Statistics Office, 2024b). The Irish healthcare system comprises a mix of public and private financing and delivery and is often described as 'complex'. The national public health and social care provider is the Health Service Executive (HSE) which was established in 2005, replacing regional Health Boards (Wiley, 2005). There is no entitlement to universal primary healthcare and eligibility varies based on age, residency and means. Broadly speaking, one third of the population ('medical card' holders) are entitled to free or subsidised services while the remaining two third have fewer entitlements and must fund the majority of care through 'out of pocket' payments or voluntary private health insurance (Thomas et al., 2021). Ireland is the only country in western Europe that does not provide free or subsidised GP care for the majority of the population (Thomas et al., 2021). Published in 2017, the whole-of-government *Sláintecare Report* sets out a ten year plan to deliver major system-wide reform including the achievement of UHC in Ireland (Burke et al., 2018).

3.3.2 Oral health policy and workforce in Ireland

For decades, oral health policy and care provision have not been political priorities in Ireland (McAuliffe et al., 2022). Currently, there are three separate state-funded primary dental care services, each targeting different population cohorts; the Public Dental Service (PDS), Dental Treatment Services Scheme (DTSS) and Dental Treatment Benefit Scheme (DTBS). The latter two serve the adult population and are delivered by private GDP contractors (Citizens Information, 2022; Health Service Executive, 2023a; HSE Primary Care Reimbursement Service, 2023a). The current system is fragmented and does not cover the entire population leaving many with restricted access to routine oral healthcare including very young children (Department of Health, 2019).

Published in 2019, Ireland's National Oral Health Policy (NOHP) titled *Smile agus Sláinte ('Smile and Health')* proposes contracting more state funded care to private GDPs including care for all children and vulnerable adults (Department of Health, 2019). The NOHP specifically highlights the

need to increase access to routine primary oral healthcare for children under six, by establishing 'dental homes' in general dental practice where prevention is embedded from infancy. Through this approach, the policy aims to reduce the one third (33%) of children with caries in their deciduous (primary) teeth by age six and lessen the demand for costly dental general anaesthesia (DGA) for extractions. Recognising Ireland's aging population, the policy also outlines challenges associated with care access and uptake among adults and older adults. The NOHP highlights the maldistribution of dentists across the state and lack of sufficient access to care among older adults living in remote, rural and western coastal areas where fewer early career dentists work. As adults retain their own functional dentition into old age, the policy seeks to increase access to preventative and restorative care and oral cancer screening among this group in local dental practices. Having sufficient numbers of publicly contracted privately practising dentists is central to the policy's implementation.

In recent years, the number of private GDPs delivering state funded care has fallen with reported reasons including suboptimal remuneration, contractual constraints that impede clinicians' autonomy and burdensome administration (McAuliffe et al., 2022). Recruitment and retention challenges in dentistry are not unique to Ireland. A recently published scoping review found many of the same factors were responsible for UK GDPs leaving NHS dentistry (D. Evans et al., 2023). There is recognition that a suitably trained workforce and sufficient HRH capacity will be required to deliver future state funded dental services in Ireland, along with accurate oral health needs assessments and public and professional agreement on priorities (Department of Health, 2019). Understanding the workforce; its composition, characteristics and distribution through robust and contemporaneous data collection is key in evaluating services and informing workforce planning into the future.

The WHO *Global Strategy on Human Resources for Health 2030* makes the case for strengthening and monitoring of workforce data as member states implement healthcare strategies and policies (World Health Organization, 2016). While HRH supply is an important indicator of effective healthcare coverage, it is regarded as insufficient on its own for workforce planning purposes, especially when considering not only population ratios, but the complexities of population health needs and demands, evolving healthcare delivery models and emergency scenarios (Kunjumen et al., 2022; World Health Organization, 2016). The WHO recommends a more nuanced approach to HRH appraisal and planning including assessment of the equitable distribution and accessibility of the workforce, its competencies, and acceptability to the population's sociocultural expectations (World Health Organization, 2016). The WHO argues that only when these criteria are met, and

when the workforce is sufficiently supported by the health system, can theoretical health coverage truly translate into effective coverage (World Health Organization, 2016).

3.4 Research objectives

This study is a health systems analysis of the Irish private GDP workforce which is contracted to provide publicly funded primary oral healthcare services, an area not previously explored.

The objectives are:

1) to describe current state funded primary oral healthcare services in Ireland and their origins

2) to identify and map GDP workforce indicators specific to state-funded, contracted primary oral healthcare in the Irish context and

3) to compare the distribution and characteristics of GDPs in Ireland by current state scheme participation, with an emphasis on rural and western coastal counties.

Ethical approval was not required for this research as it utilises publicly available data and all results presented are anonymised.

3.5 Methods

This health systems analysis comprises a documentary analysis and a separate, secondary data analysis (Figure 7).

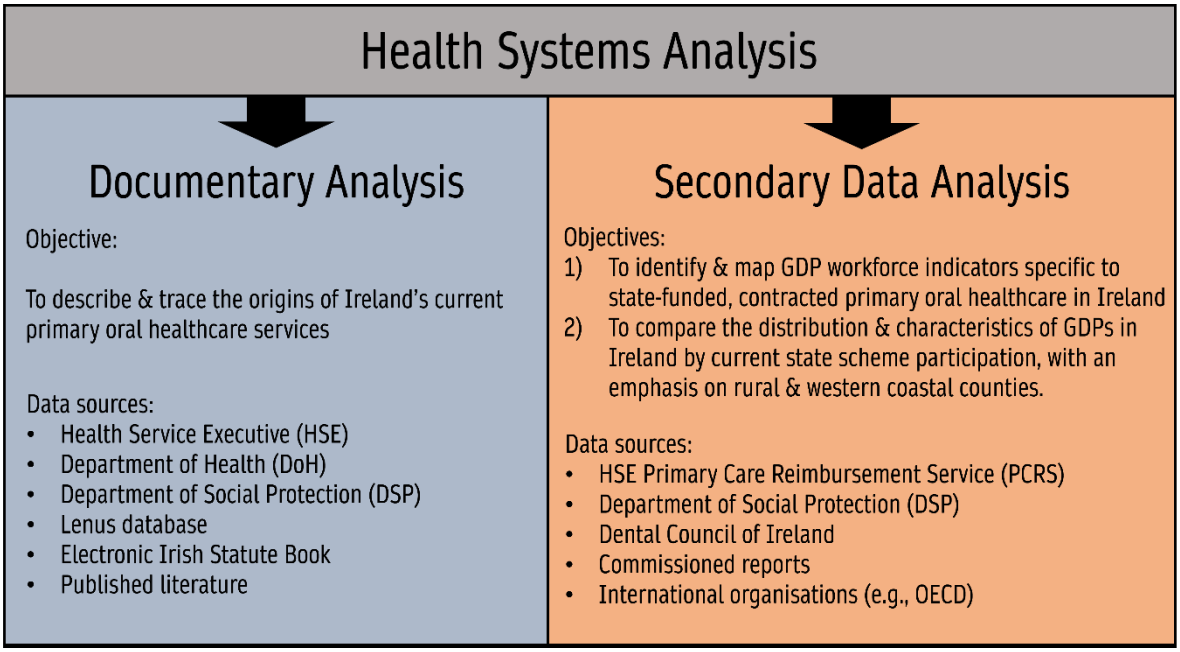


Figure 7: Health systems analysis: over-arching methodology

3.5.1 Documentary analysis

Documentary analysis was used to describe and trace the origins of Ireland's current primary oral healthcare services. We drew upon a range of documents identified through online searches of websites including the HSE, Government of Ireland including the Departments of Health (DoH) and Social Protection (DSP) respectively; the Lenus database (the Irish Health Research Repository) and the electronic Irish Statute Book. Twenty-seven documents were retrieved spanning the period 1952 to 2023. These included websites (n=8), health service documents (n=4), health policy documents (n=3), government reports (n=3), other reports (n=3), journal articles (n=3) and Acts of the Oireachtas (Irish Parliament) (n=3).

3.5.2 Secondary Data Analysis

3.5.2.1 Conceptual framework

We utilised the WHO Dimensions of health workforce coverage ('AAAQ') framework to identify and characterise available GDP workforce indicators in Ireland (Figure 8) (Campbell et al., 2013). Developed by Campbell and colleagues, and adapted from the UHC 'cube'(World Health Organization, 2010b), the framework integrates Tanahashi's model for health coverage and the

right to health and outlines the key components of effective UHC as they relate to the health workforce namely: availability, accessibility, acceptability, quality and service utilisation. To provide accessible care, adequate availability of healthcare workers is required, and acceptability enables accessibility (World Health Organization, 2016).

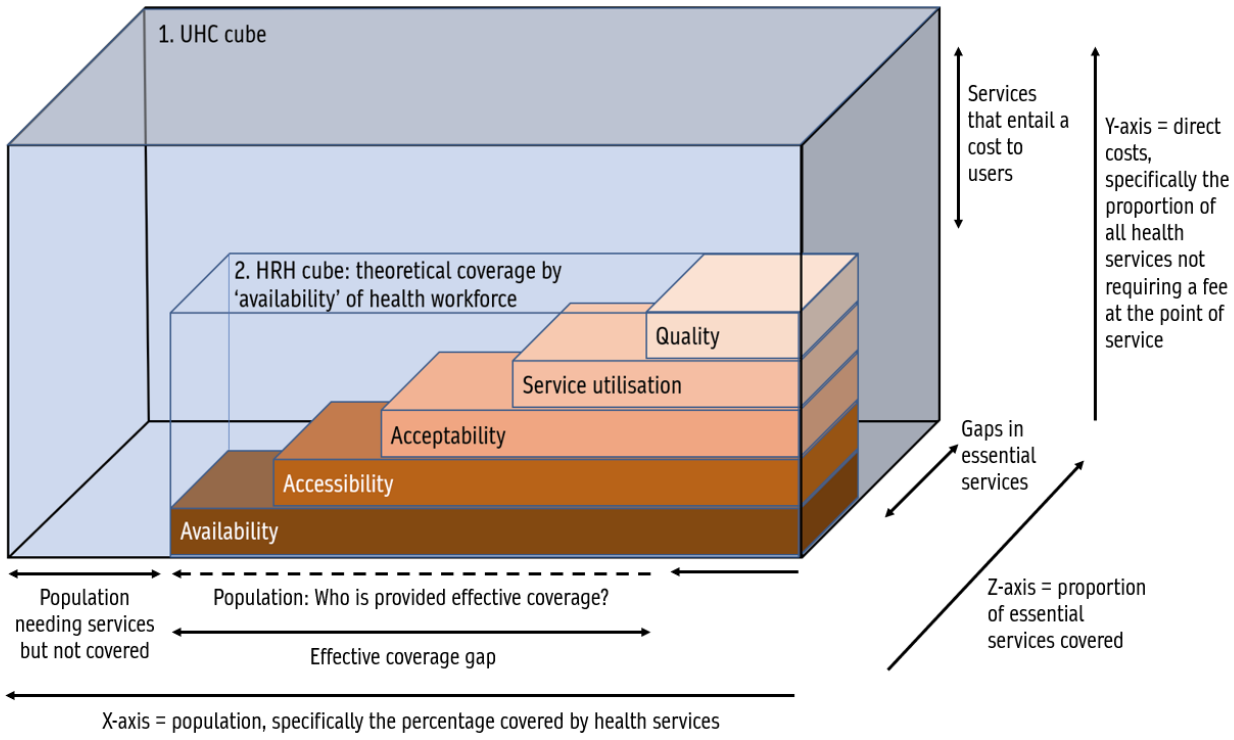


Figure 8: Dimensions of universal health coverage (UHC) relating to human resources for health (HRH): effective coverage (Adapted from Campbell et al., 2013)

Secondary data analysis (SDA) is the use of data created by another researcher or collector to conduct a study with a different purpose from the original study (McGlacken-Byrne et al., 2023). SDA of publicly available data was conducted to identify and describe GDP workforce indicators in Ireland and to utilise these to compare contract holders by state scheme. We analysed 15 years of data, from 2008 to 2023. This date range was selected as it coincides with global events impacting on the Irish health system, namely the 'financial crisis and austerity era' (2008-2014) during which there were significant budgetary cuts to dental services, the 'recovery period' (2015-2019), the 'COVID-19 pandemic era' (2020-2022) and more recently the 'inflationary period' compounded by the Russian invasion of Ukraine (2022-present), an approach used in other health system workforce analyses (Fleming, Thomas, et al., 2022).

3.5.2.2 Data sources

Several data sources were utilised to identify indicators including GDP characteristics, distribution, and activity nationally. These included the HSE Primary Care Reimbursement Service (PCRS) website and reports, DSP website, Dental Council of Ireland register of dentists, commissioned reports, international organisations' websites, for example OECD Stat. Where incomplete datasets were identified, primary data holders were contacted by email and requests made to signpost to or to make these available as personal communications. Full details of data sources are contained within Table 1 in the results below.

3.5.2.3 Analysis

Following extraction from primary sources, GDP contractor data were cross tabulated with the Dental Council register, cleansed, and manually merged into a single master database using Excel 2016 software (Microsoft Corp, WA, USA). Collated data relevant to individual GDP contractors included names, practice addresses and telephone numbers, sex, DTSS and DTBS contract numbers, year, and place of primary dental qualification. Where incomplete records were identified, namely partial practice addresses, supplementary online searches were conducted using Google and the Eircode (postcode) Address Finder using available information, e.g., practice telephone numbers to complete individual GDP records (Eircode, 2023).

To map and compare the distribution of public contracts, practice addresses linked to contract numbers were assigned an urban-rural and deprivation index classification using the Central Statistics Office (CSO) Urban and Rural Life in Ireland and Pobal HP Deprivation Index for Small Areas online mapping tools respectively (Central Statistics Office, 2019a; Pobal Maps, 2023). Using Google Maps, we also assessed accessibility for wheelchair users for each individual practice identified in our sample (Google, 2023). For manageability, and to allow for a comparison of contract distribution across the state, including in rural and coastal areas, we chose two geographical footprints congruent with the new HSE Health Regions: Dublin and Midlands (D&M) (population 989,000) and West and Northwest (W&NW) (population 760,139). These areas capture several counties across the east, midlands, west and northwest of Ireland. They include part of Ireland's capital and largest city - Dublin, satellite and independent towns, and remote, rural, and western seaboard areas which are highlighted in the NOHP as workforce and access blackspots. These regions also include some of the least and most deprived areas in the state. Clinician level indicators (sex, years qualified and place of qualification) were used to compare the characteristics of GDPs by types of contracts held. Descriptive statistics were computed using STATA/SE 17 software (StataCorp LLC, TX, USA).

3.6 Results

3.6.1 Primary oral healthcare in Ireland: system overview and development

Like the general healthcare system, Ireland's oral healthcare system is described as 'hybrid', with services delivered through a mix of private and public providers (Nolan, 2019). However, the majority of dental care in Ireland is delivered by GDPs working in independent ('private') dental practices and paid for privately i.e. 'out of pocket' (Smith et al., 2022). In 2023 there were three state funded primary care services in Ireland (Table 1) as well as secondary (specialist-level) and tertiary (highly specialised) dental care delivered primarily by university dental teaching hospitals in Dublin and Cork (Cork University Dental School & Hospital, 2025; Dublin Dental University Hospital, 2023). Acceptance criteria for care in these hospitals is primarily for educational purposes. An overview of the oral healthcare system and theoretical population coverage (eligibility) is provided in Figure 9. It must be noted however, that theoretical coverage does not automatically translate into access to care. One notable example is the HSE PDS which technically offers comprehensive care to targeted age groups only, however in reality there is large variability in service provision and access throughout the state (McAuliffe et al., 2022).

Table 1: Primary oral healthcare services in Ireland

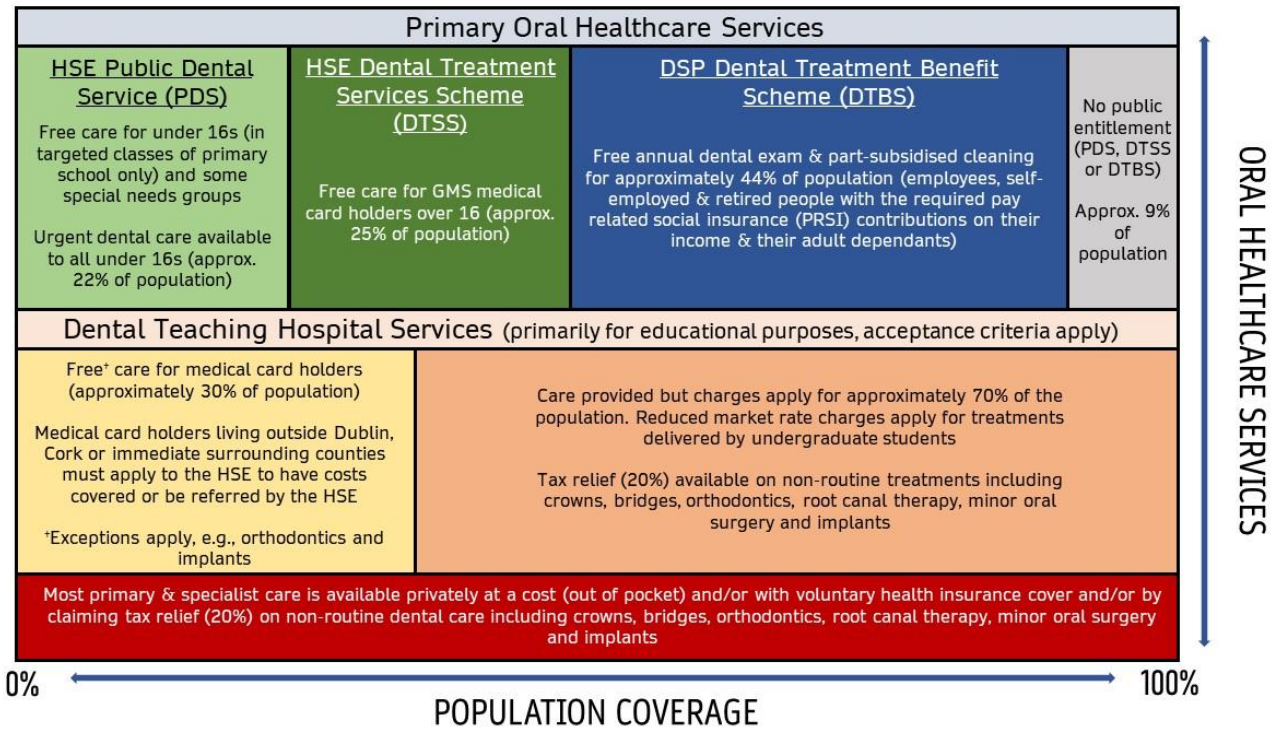
	HSE Public Dental Service (PDS)	**HSE Dental Treatment Services Scheme (DTSS)**	**DSP Dental Treatment Benefit Scheme (DTBS)**	**No public cover**
Eligible population *Note: In 2022, the population of Ireland was 5.1million (Central Statistics Office, 2023)*	1.08m children aged 0-16(Central Statistics Office, 2023). Some adults with special needs or additional vulnerabilities (no exact number available).	1.29m adult medical card holders aged >16 years (2023) (HSE Primary Care Reimbursement Service, 2023b).	2.25m insured workers and their adult dependents (2023)(Department of Social Protection, 2023b).	~500,000 (estimate) Individuals and families who can afford to pay out of pocket.
Annual expenditure	€135m* (2023) (Houses of the Oireachtas, 2023) (*estimate, figure includes funding for HSE PDS orthodontic services)	€64.7m (2023)(HSE Primary Care Reimbursement Service, 2023b)	€57.2m (2022)(Department of Social Protection, 2023a)	€491m* (2022)(Central Statistics Office, 2024a) *Household out of pocket payments
Treatments covered	Oral examination and single course of	Without prior approval: annual oral	Free annual oral examination and part-	All treatments including cosmetic

	comprehensive care to achieve or maintain oral health. Target age groups only (children aged 7-8 and 11-12). Some special needs groups(McAuliffe et al., 2022). Urgent dental care (includes some medical card holders unable to access care on DTSS). Free at point of use.	examination, prophylaxis ('scale & polish'), 2 fillings, any extractions, denture repairs, 1st stage root canal therapy, other emergency care (HSE Primary Care Reimbursement Service, 2022a). With prior approval: dentures, 2nd stage root canal therapy (front teeth only), apicectomy, protracted periodontal care(HSE Primary Care Reimbursement Service, 2022a). Free at point of use.	subsidised* prophylaxis ('scale & polish') or protracted periodontal care (Department of Social Protection, 2023b). *Patients pay the balance where the cost of prophylaxis or periodontal treatment exceeds €42. Excess payment is capped at €15 for prophylaxis, no cap on periodontal treatment excess payment.	dentistry and facial aesthetics.
Workforce	Salaried public dentists & other dental healthcare professionals (e.g., hygienists)	Private GDP contractors and their teams	Private GDP contractors and their teams	Private GDPs and specialist dental practitioners and their teams

HSE: Health Service Executive, DSP: Department of Social Protection, GDP: General Dental Practitioner

The PDS is operated directly by the HSE and delivered by teams of salaried dental professionals. As of August 2023, there were 295 whole-time equivalent (WTE) dentists and 59 WTE dental hygienists

employed by the PDS (Health Service Executive, 2023b). Supplementing the PDS are specialist referral services including HSE orthodontics, oral surgery, and general anaesthetic services (Henry et al., 2021).



HSE: Health Service Executive, GMS: General Medical Services, DSP: Department of Social Protection

Figure 9: Oral healthcare services and theoretical coverage (eligibility) for care in Ireland, 2023

Adapted from Burke et al., 2016 (Burke et al., 2016).

The two contracted state schemes serve different populations. The DTSS offers adults over 16 who hold a medical card a limited range of routine and urgent treatments (Health Service Executive, 2023a). Medical cards entitle holders to free public healthcare services and eligibility is based on a means-tested income assessment or having certain medical conditions or social vulnerabilities (Health Service Executive, 2023c).

The DTSS is administered by the HSE PCRS which manages claims and payment of fees to GDPs (HSE Primary Care Reimbursement Service, 2020b). Treatments are classified as routine ('above the line') or complex ('below the line')(HSE Primary Care Reimbursement Service, 2022a). 'Above the line' treatments do not require prior approval and include an oral examination, cleaning, two fillings, any extractions and some emergency treatments per calendar year. Additional ('below the line') treatments (for example, root canal treatments or dentures) require prior approval by local

HSE PDS managers. Small numbers of patients considered 'high-risk', for example those with haemophilia, may be eligible for a wider range of treatments (HSE Primary Care Reimbursement Service, 2022a). The DTBS covers a wider population, namely insured workers, however it offers an annual dental examination and cleaning only, with additional treatments being paid for 'out of pocket' privately (Department of Social Protection, 2023b). In contrast to the DTSS, the DTBS is administered by the DSP. Both schemes remunerate GDPs on a 'fee per item' basis (Department of Health, 2019). Prior to 2010 and the imposition of budgetary cuts following the financial crisis of 2008, a wider range of treatments were available on both schemes (Woods et al., 2017).

The current system of state funded services delivery by private GDPs emerged in phases commencing with the Social Welfare Act in 1952 which established the Treatment Benefit Scheme (TBS) which includes the DTBS (Government of Ireland, 1952). Since its inception, the DTBS has remained administratively distinct from other state-financed health services (Department of Finance, 2001). Individuals on low incomes in Ireland have been entitled to free dental care since the 1953 Health Act (Government of Ireland, 1953). From 1970 to 2005, regional Health Boards were responsible for delivering services (Government of Ireland, 1970). Since 2005, the HSE is responsible for contracting and or delivering public care. Between 1953 and 1994, care for medical card holders was delivered by salaried dentists employed by former Health Boards and through *ad hoc* initiatives utilising private GDP contractors (Department of Finance, 2001). Recognising the contribution made by GDPs, a working group established by the Minister for Health in 1988 recommended that adult medical card holders be treated in the private sector, freeing up capacity of salaried dental services for child dental care (Department of Health, 1988). The DTSS was established in 1994 following the publication of the *Dental Health Action Plan (DHAP)* which was part of a wider healthcare strategy known as *Shaping a Healthier Future* (Department of Health, 1994b). Its aim was to improve the oral health of adult medical card holders and reduce inequalities by providing routine treatment, emergency care, and dentures to the elderly population (Department of Health, 1994a). Medical card holders were highlighted as having high levels of unmet dental needs in the National Survey of Adults' Dental Health (1989/90) (O'Mullane, 1990). Medical card holders were gradually transferred from salaried services to private GDPs, commencing with the over 65s who had access to routine care including dentures. All other eligible population groups had access to emergency care. The scheme granted full access to routine care for 16-34 year olds in 1996 and 34-65 year olds in 2000 (Woods et al., 2017).

3.6.2 GDP-contractor workforce in Ireland: available indicators

Publicly available data allow us to begin building a picture of the prospective and actual GDP workforce in Ireland as it relates to the provision of state funded care. We mapped GDP workforce indicators in Ireland to 'availability', 'accessibility', 'acceptability', and 'service utilisation' critical dimensions of human resources for health as outlined in the HRH UHC cube. Indicator descriptions and 'AAAQ' framework dimension definitions are provided in Table 2.

Table 2: GDP workforce indicators in Ireland (state-funded contracted primary dental care)

'AAAQ' effective health coverage dimension	Dimension Definitions(Campbell J, 2013)	Indicator	Data available for year(s)	Indicator source, citation
Availability	The sufficient supply, appropriate stock of health workers, with the relevant competencies and skill mix that corresponds to the health needs of the population	Number of dentists licensed to practice, head count. Includes practising and non-practising dentists	2023	Dental Council of Ireland(Dental Council of Ireland, 2023)
		Number of dentists licensed to practice, per 10,000 population. (WHO recommended core indicator 1: Number of health workers per 10,000 population(World Health Organization, 2010a))	2021	WHO European Health Information Gateway (World Health Organization (WHO), 2023)
		Number of practising dentists, head count (estimate).	2022	OECD (Organization for Economic Co-operation and Development, 2023b)
		Number of dentists graduating from dental schools in Ireland (per 100,000 population). (WHO recommended core indicator 3: Annual number of graduates of health professional educational institutions per 100,000 population – by level and field of education)(World Health Organization, 2010a)	2022	OECD (Organization for Economic Co-operation and Development, 2023a)
		Number of private GDP Dental Treatment Services Scheme (DTSS) contracts (WHO associated indicator: rate of retention of health service providers at primary health-care facilities in the past 12 months)(World Health Organization, 2010a)	2008 – 2023	HSE PCRS(HSE Primary Care Reimbursement Service, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020b, 2021, 2022b, 2023b, 2023c)
		Number of private GDPs who submitted claims for reimbursement under the DTSS	2008-2022	HSE PCRS(HSE Primary Care Reimbursement Service, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017) Personal communications (Appendix 1)

		Number of private GDP Dental Treatment Benefit Scheme (DTBS) contracts (WHO associated indicator: rate of retention of health service providers at primary health-care facilities in the past 12 months)[56]	2008, 2016, 2023	DSP(Department of Social Protection, 2023c) Hasse and James (2016)(Haase & James, 2016) Guiney et al. (2013)(Guiney et al., 2013)
Accessibility	The equitable distribution of health workers in terms of travel time and transport (spatial), opening hours and corresponding workforce attendance (temporal), the infrastructure's attributes (physical – such as disabled-friendly buildings), referral mechanisms (organizational) and the direct and indirect cost of services, both formal and informal (financial)	DTSS and DTBS GDP contractor practice address (street, town, county and/or postcode) (WHO core indicator 2: Distribution of health workers by occupation/specialization, region, place of work and sex)(World Health Organization, 2010a)	2023	HSE PCRS(Health Service Executive, 2023d) DSP(Department of Social Protection, 2023c)
		Dental practice main entrance wheelchair accessibility	2023	Google Maps(Google, 2023)
		Dental practice addresses urban-rural classification (by small area)	2016	CSO Urban and Rural Life in Ireland (Central Statistics Office, 2019a)
		Dental practice addresses deprivation index (by small area)	2016	Pobal HP Deprivation Index for Small Areas (SA)(Pobal Maps, 2023)
Acceptability	The characteristics and ability of the workforce to treat all patients with dignity, create trust and enable or promote demand for services; this may take different forms such as a same-sex provider or a provider who understands and speaks one's language and whose behaviour is respectful according to age, religion, social and cultural values etc.	DTSS and DTBS GDP-contractor place of primary dental qualification (university, city, country) (WHO associated indicator: proportion of nationally trained health workers (e.g., with distribution of foreign trained workers by country of origin) [56]	2023	Dental Council of Ireland(Dental Council of Ireland, 2023)
		DTSS and DTBS GDP-contractor number of years qualified as dentist	2023	Dental Council of Ireland (Dental Council of Ireland, 2023)
		DTSS and DTBS GDP-contractor sex	2023	*HSE PCRS(Health Service Executive, 2023d) *DSP(Department of Social Protection, 2023c) *Derived from*
Service utilisation	No definition provided for in AAAQ framework. WHO definition: the quantity of health care services used	Number of patients eligible for care under the DTSS (adults <16 holding a medical card)	2008-2023	HSE PCRS(HSE Primary Care Reimbursement Service, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020b, 2021, 2022b, 2023b, 2023c)
		Number of unique patients treated under the DTSS		
		Number of treatments carried out under the DTSS		

3.6.3 'Availability' of dentists in Ireland

3.6.3.1 Dentists in Ireland – general workforce data

In August 2023, there were 3,605 dentists licensed to practice in Ireland (Dental Council of Ireland, 2023). This figure reflects those practising in Ireland as well as those living and working overseas who maintain registration with the Dental Council of Ireland. This equates to just under 7 dentists per 10,000 population, 0.7 dentists per 1,000 population or 1,500 people per dentist (Organization for Economic Co-operation and Development, 2023b). According to the OECD, the estimated number of practising dentists in Ireland in 2022 was 2,420 (Organization for Economic Co-operation and Development, 2023b). This equates to just under 5 dentists per 10,000 population or 2,100 population per dentist (Organization for Economic Co-operation and Development, 2023b). In 2022, 90 dentists graduated from Ireland's existing two dental schools (Organization for Economic Co-operation and Development, 2023a). This equates to just under 2 graduating dentists per 100,000 population. In 2021, the European Union figure was 3.1 per 100,000 (European Union, 2023).

3.6.3.2 DTSS GDP contracts, service utilisation and expenditure 2008-2023

The number of DTSS contracts held by private GDPs and those participating clinically in the scheme have steadily declined in the 15 years since 2008 (Figure 10).

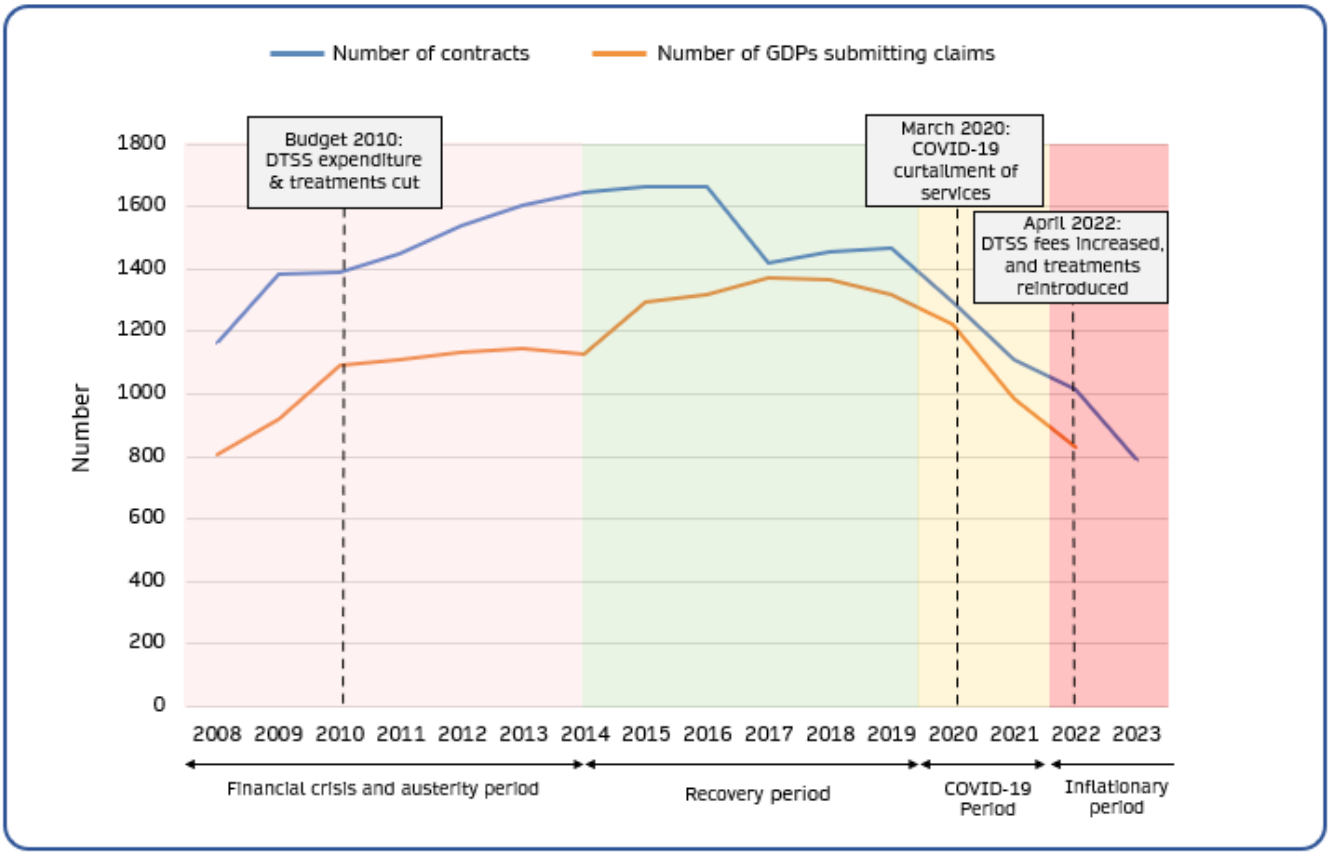


Figure 10: GDP DTSS contracts and GDPs submitting claims 2008-2023

On December 31st 2008, at the outset of the global financial crisis, there were 1,161 DTSS agreements between the HSE and private GDPs (HSE Primary Care Reimbursement Service, 2009). As the global financial crisis took hold the number of DTSS treatments carried out peaked at over 1.5 million in 2009 (HSE Primary Care Reimbursement Service, 2010). The number of unique patients who received care on the scheme was 343,067 with government expenditure of just under €87m (HSE Primary Care Reimbursement Service, 2010). In response to cuts in government expenditure announced in Budget 2010, funding was capped at 2008 levels and restrictions placed on number of treatments permissible (Burke, 2010). The volume of treatments claimed subsequently dropped by 26% from 1.4 million in 2010 to 1 million in 2011(HSE Primary Care Reimbursement Service, 2012). Despite the cuts, the number of contracts increased by 18% from 1,392 in 2010 to 1,643 in 2014, marking an overall increase of 40% in the number of agreements during the 'austerity' period (Figure 10) (HSE Primary Care Reimbursement Service, 2015). Similarly, the volume of treatments and patients treated steadily increased, plateauing in 2014 at just over 1.3 million treatments and 430,000 patients. At 1,664, the number of contracts

peaked in 2016, thereafter declining throughout Ireland's economic recovery period alongside the number of eligible patients.

COVID-19 was declared a pandemic in March 2020 and dentistry was restricted to urgent care only (until May 2020) when enhanced infection control measures were implemented (Dental Council of Ireland, 2020a, 2020b; Government of Ireland, 2020). Reduced clinical capacity throughout 2020 coincided with a 25% drop in DTSS activity (Figure 11). By the end of 2020, the number of contracts had declined to 1,292 and by the end of 2021 the figure stood at 1,111. In April 2022, the Minister for Health announced an increase in DTSS fees of between 21% and 50% and the re-introduction of 'scale and polish' for all patients (Flanagan, 2022). This was the first time fees were increased since 2010. The volume of claims for that service item alone increased by 1305% from 7,125 in 2021 to 100,113 in 2022. Despite these changes, there was a further decline in number of GDP contracts. In August 2023, 16 months after the Russian invasion of Ukraine and the start of the inflationary period, there were 787 agreements remaining between the HSE and private GDPs, representing a 22% reduction on 2022 levels. Throughout the COVID-19 and inflationary period, the gap between those eligible for and those receiving care on the DTSS widened (Figure 11).

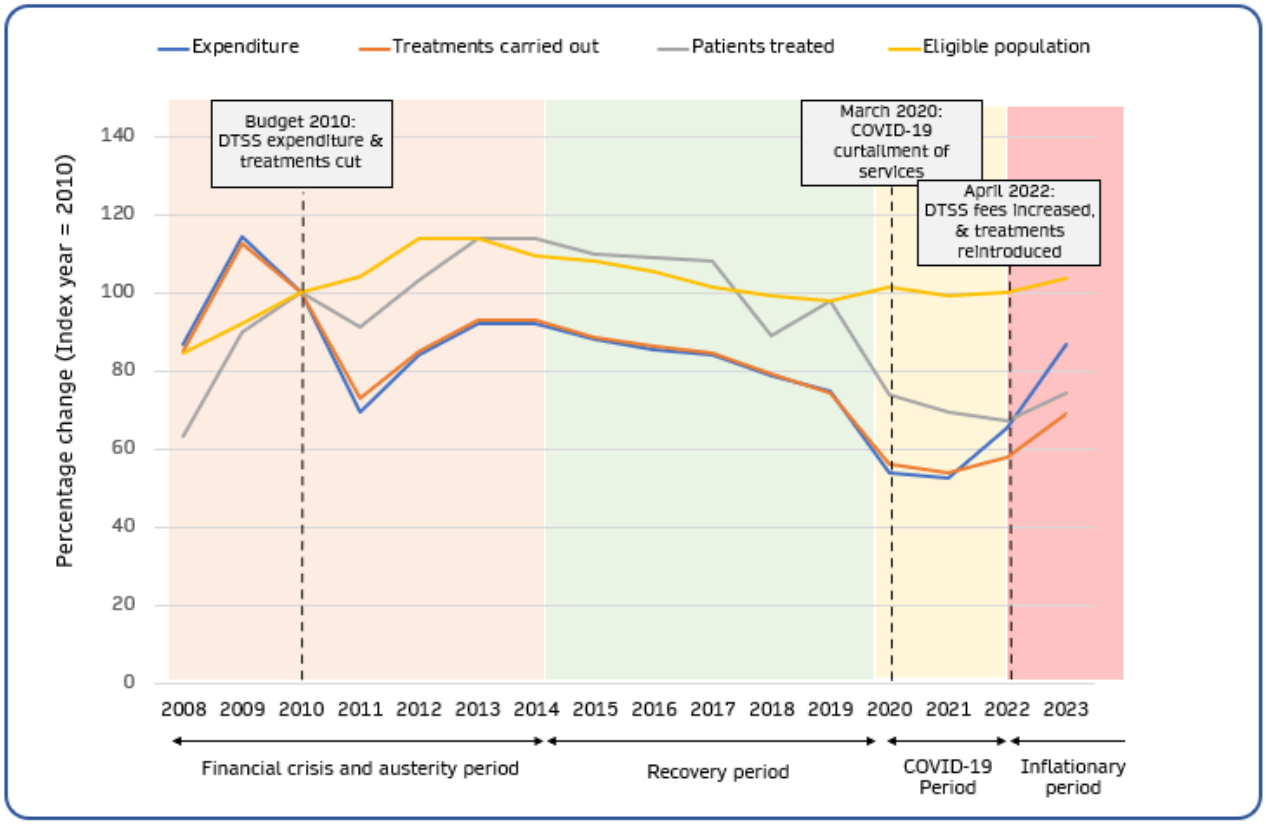


Figure 11: DTSS utilisation and expenditure, percentage change 2008-2023

Analysis of the number of dentists with DTSS contracts by payment range published in PCRS annual reports and supplementary data made available by the HSE (personal communications, P Leavy and D Nicholson – see Appendix 1) revealed the difference in number of dentists holding contracts compared to those receiving payment, and are therefore considered 'clinically active' in the scheme (Figure 10) (HSE Primary Care Reimbursement Service, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018). Between 2008 and 2016, the difference in the number of GDPs holding contracts and those receiving payment for activity ranged from 20% to 33% (Figure 10). However, from 2017 onwards this gap narrowed, and in 2022 there was a difference of 18% between the number of contract holders and claimants. In 2022, the HSE remunerated GDPs to the sum of €49.5 million with respect to just under 257,000 unique DTSS patients (HSE Primary Care Reimbursement Service, 2023c). This equates to an average annual costing of €190 per unique patient.

3.6.3.3 DTBS GDP contracts 2008-2023

Figures on the number of DTBS agreements by year are not made publicly available by the DSP. A 2013 study by Guiney et al. examining longitudinal trends in DTBS activity found the number of GDPs submitting claims in 2008 was 1,525 (Guiney et al., 2013). Only one other data source relating to DTBS contractors during the last 15 years was readily identified, Hasse and James' spatial analysis which found there were 1,959 DTBS contracts, relating to 1,488 unique GDPs across Ireland in 2016 (Haase & James, 2016). As of August 2023, there were 2,384 DTBS agreements across Ireland (Department of Social Protection, 2023c). In the 12 months up to December 2023, the DSP reportedly made payments to 1,878 contractors (Irish Dental Association, 2023a).

3.6.4 'Accessibility'

We retrieved at total of 976 individual contract records for DTSS or DTBS providers in our two health regions. Of these, 48 were excluded from our analysis for the following reasons: GDP could not be identified from the Dental Council register (n=42), no practice details provided, or practice closed (n=4), duplicate of same contract type for GDP at practice (n=2) Our final sample consisted of 928 contract records with respect to 655 unique GDPs working across 288 dental practices (172 in D&M and 116 in W&NW).

3.6.4.1 GDP contracts distribution

We investigated the distribution of GDP contracts by state scheme according to the AAAQ framework across the D&M and W&NW regions. As of August 2023, there were a total of 125

DTSS agreements with respect to 119 unique dentists in D&M. This equates to 16% of the national total of DTSS contracts. Across the W&NW, there were 131 DTSS agreements with respect to 124 unique GDPs, representing 17% of the national total of DTSS contracts. Conversely, the number of DTBS agreements in D&M stood at 459 with respect to 412 unique GDPs, equating to 19% of the national total while in the W&NW, there were 261 active DTBS contracts among 237 unique GDPs or 11% of the national total. Owing to its size and predominance, most public contracts in D&M were active in Dublin Southwest city and county (Figure 12). In midland counties outside Dublin, most contracts were active in independent urban towns with populations between 1,500 and 49,000 where less than 20% of the population work in cities (Central Statistics Office, 2019b). In contrast to D&M, 20% of DTSS contracts and 14% of DTBS contracts in the W&NW were spread across rural areas, reflecting the region's geography.

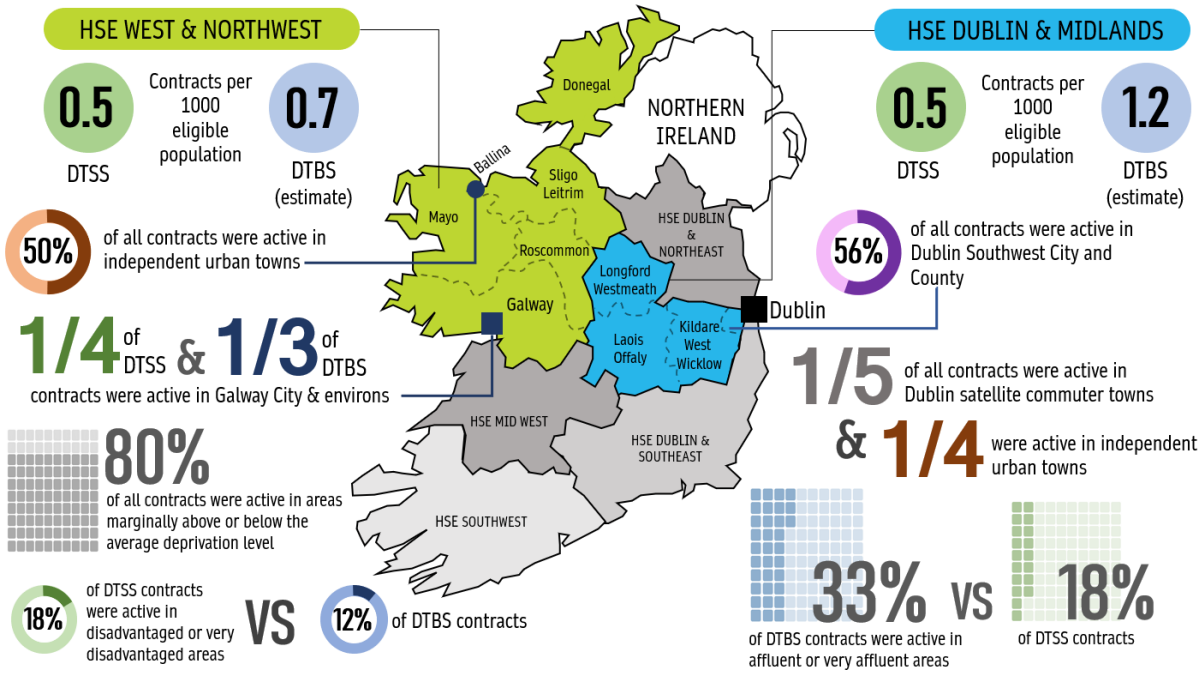


Figure 12: DTSS and DTBS distribution of contracts; summary statistics (August 2023)

Most contracts were allocated to GDPs working in areas marginally above or below the average deprivation level however differences were noted in the proportion of contracts active in affluent and disadvantaged areas (Figure 12). While just 7% of all DTBS contracts in D&M were active in 'disadvantaged' or 'very disadvantaged' areas, the figure for DTSS contracts was more than double this at 15%. Conversely, almost twice the number of DTBS agreements in D&M were active in 'affluent' or 'very affluent' areas compared to DTSS contracts. A higher proportion of DTBS

contracts in the W&NW region were assigned to GDPs working in 'disadvantaged' or 'very disadvantaged' areas compared to D&M, while the figure for DTSS contracts was like D&M at 18%. This difference between the regions can also be seen in the proportion of contracts active in 'affluent' or 'very affluent' areas with just 6% of DTBS and 2% of DTSS contracts in the W&NW assigned to practices in these areas, reflecting the region's geography and economy.

3.6.4.2 Practice wheelchair accessibility

Using the search filter on Google Maps, we investigated practices' reported main entrance accessibility for wheelchair users (Google, 2023). Of the 288 practices identified in our sample, 181 (63%) were accessible of which 89 (49%) had at least one DTSS-contracted GDP listed as working there. More practices in the West & Northwest (n=81, 69%) were listed as wheelchair accessible compared to Dublin and Midlands (n=100, 58%).

3.6.5 'Acceptability'

3.6.5.1 GDP-contractor characteristics

We compared the characteristics of contractors by available demographics to ascertain population 'acceptability' according to the 'AAAQ' framework, namely experience and diversity. Triangulation of the three publicly available databases, allowed for comparison of GDPs by contracts held utilising the following indicators: sex, number of years qualified and place of qualification (Table 3). As of August 2023, there were 655 unique GDPs holding DTBS and or DTSS contracts across the two health regions.

Table 3: **Comparison of GDPs by contracts held (2023)**

Variable	DTBS-only (n=426)	DTSS + DTBS (n=212)	DTSS-only (n=17)	DTBS-only (n=297)	DTSS + DTBS (n=104)	DTSS-only (n=7)	DTBS-only (n=129)	DTSS + DTBS (n=108)	DTSS-only (n=10)
	Combined regions			HSE Dublin & Midlands			HSE West and Northwest		
Sex (female) n (%)	228 (53%)	87(41%)	5 (29%)	161 (54%)	41 (39%)	2 (2%)	67 (52%)	46 (43%)	3 (30%)
Number of years qualified, n (%)									
0-5	78 (18%)	18 (8%)	3 (17%)	56 (19%)	10 (10%)	2 (29%))	22 (17%)	8 (7%)	1 (10%)
6-10	87 (20%)	27 (13%)	2 (12%)	64 (22%)	13 (12%)	1 (14%)	23 (18%)	14 (13%)	1 (10%)
11-20	126 (30%)	41 (19%)	3 (17%)	96 (32%)	21 (20%)	1 (14%)	30 (23%)	20 (18%)	2 (20%)
>20	135 (32%)	126 (60%)	9 (53%)	81 (27%)	60 (58%)	3 (43%)	54 (42%)	66 (61%)	6 (60%)
Place of qualification, n (%)									
Ireland	288 (68%)	137 (65%)	15 (88%)	203 (68%)	70 (67%)	6 (86%)	85 (66%)	67 (62%)	9 (90%)
UK	49 (12%)	38 (18%)	1 (6%)	30 (10%)	9 (9%)	0	19 (15%)	29 (27%)	1 (10%)
EU	65 (15%)	22 (10%)	0	50 (17%)	13 (12.5%)	0	15 (12%)	9 (8%)	0

Non-EU/UK	24 (5%)	15 (7%)	1 (6%)	14 (5%)	12 (11.5%)	1 (14%)	10 (7%)	3 (3%)	0

Most GDPs holding only DTBS contracts were female (53%) while the majority of DTSS contract holders were male, of whom most held DTBS contracts also (Table 3). A small number of GDPs were listed as holding only DTSS contracts. DTSS providers were, on average, qualified longer than DTBS-only providers across the two regions with 60% of GDPs holding both DTSS and DTBS contracts being qualified 20 years or more compared to 32% of DTBS-only contractors. Comparison of contractors by place of primary dental qualification revealed only minor differences between GDPs by contracts held (Table 3).

3.7 Discussion

This study investigates the availability of GDP workforce indicators relevant to state-funded contracted primary oral healthcare in Ireland and compares contractors by scheme across two distinct geographical regions, one of which is highlighted in the NOHP as lacking in sufficient workforce and where access to routine care is limited. The study provides an overview of primary oral healthcare services in Ireland highlighting the important role played by private GDPs in the delivery of state funded care since the early 1950s (Department of Finance, 2001). We identified and retrieved several indicators aligned to the WHO Dimensions of health workforce coverage ('AAAQ') framework.

3.7.1 General contractor workforce trends

The main findings of this study highlight the declining number of GDPs holding DTSS contracts and those clinically engaging with the scheme. This was accompanied by a fall in the number of patients treated despite an increase in the numbers eligible. Dentists in this scheme are more likely to be male, qualified longer and practising in disadvantaged areas outside cities compared to DTBS-only contractors. This finding is critical for Ireland given that the current oral health policy, *Smile agus Sláinte*, is reliant on much greater provision of publicly funded care by private GDPs (Department of Health, 2019).

Globally, health systems are experiencing similar challenges regarding workforce capacity and access to care. In 2021, the number of private GDPs providing NHS general dental services across England fell to its lowest level since 2014 from 24,684 in 2020 to 23,733 with a myriad of factors reportedly accounting for recruitment and retention difficulties there (Deborah Evans et al., 2023). A frequently cited factor being the NHS contract which operates a target-based, 'bundled care' model and accounts for high levels of stress and burnout among GDPs as they attempt to fulfil contract requirements (D. Evans et al., 2023; Rutland, 2021). It has also been suggested that a burgeoning private market in cosmetic dentistry and facial aesthetics, driven in part by social media promotion is facilitating dentists to choose to work in that sector (Donnell et al., 2021; Showker, 2022). This coupled with changing career aspirations among younger dentists, who favour flexible, part time working and variety, might further be displacing capacity for state-funded care which has been portrayed negatively (Deborah Evans et al., 2023; Thomson et al., 2021). Similarly, in Scotland, where a fee per item contract operates, the number of GDPs providing NHS care has dropped by 12% since the onset of the COVID-19 pandemic when services were severely curtailed (Westgarth, 2023). This study shows that Ireland has experienced a proportionally

steeper decline in the number of DTSS contract holders and those engaged clinically with the scheme, while the numbers holding DTBS contracts appear to have increased. Unlike the UK, the oral healthcare market in Ireland is a largely private one and state funded services do not cover most of the population, nor do they offer comprehensive baskets of care (Smith et al., 2022). Despite these differences, many of the same factors influencing UK GDPs' decisions to leave the NHS or reduce their commitment appear to be the same as in Ireland and elsewhere. In the United States (US) private GDPs can opt into public insurance 'safety net' schemes for disadvantaged groups, for example, Medicaid (Mertz & Finocchio, 2010). These remunerate dentists on a fee per item basis and, like the DTSS, have also experienced difficulties with GDP participation, namely low enrolment in or low willingness to provide care to patients on schemes (Maxey et al., 2018). Low reimbursement rates, burdensome administration and negative perceptions of service users have consistently been reported as reasons for non-participation among American GDPs (Decker, 2011).

By mapping workforce trends to key points in time during the period 2008-2022, we can also see the impact of broader contextual factors and market forces on GDP-contractor trends in Ireland, one notable example being the 2008 global recession. Despite cuts to schemes in 2010, the number of GDPs signing DTSS agreements and submitting claims increased. During this period, Ireland saw increased unemployment and less disposable income among the general population (Maresso et al., 2015). This had the effect of increasing the number of medical card holders and reducing 'out of pocket' spending on healthcare (Johnston et al., 2020). Studies suggest that during periods of economic difficulty, private expenditure on oral healthcare declines, especially among low-income populations, along with GDPs' income (Elstad, 2017; Kostas & Dimitris, 2017). It is possible therefore, that despite cuts to treatments available, the DTSS offered Irish GDPs some level of demand-led stability and regular income, as has been theorised by others elsewhere (Beazoglou et al., 2015; Guay & Blatz, 2019). As Ireland exited its EU/International Monetary Fund (IMF) financial 'bailout' in 2013 and entered a period of economic growth, DTSS activity began to fall.

3.7.2 GDP contractor distribution and characteristics

Findings of this study with respect to the distribution and characteristics of GDP contractors mirror those of some US-based studies of safety net providers. Using provider and claims databases, Nasseh et al. estimated that 48% of GDPs with 100 or more Medicaid patients practised in very disadvantaged areas compared to 18% of GDPs with no Medicaid patients (Nasseh et al., 2023). They also found that GDPs providing Medicaid care were more likely to practice in rural areas. In contrast to the current study however, a 2021 spatial analysis of NHS

dentists across England revealed widespread geographical disparities between urban and rural areas (Jo et al., 2021). Jo et al. found that almost all of England's urban population live in close proximity to an NHS dental practice compared to 50% of the rural population. In this study, we noted the same ratio of DTSS providers per 1000 eligible population across both regions, contrasting with England's experience. A 2018 study by Maxley et al. found that early career GDPs (aged 35 or under) in the US state of Indiana were less likely to be clinically engaged in Medicaid compared to older GDPs aged 55 and above, reflecting similar findings of this study (Maxey et al., 2018). Maxley et al. also noted that among 1,033 Medicaid-enrolled GDPs approximately 25% were clinically inactive, submitting no claims on the scheme, again mirroring our findings with respect to DTSS engagement.

3.7.3 Data and monitoring

As part of *Smile agus Sláinte's* development, several workforce-related reports were commissioned including Hasse and James' spatial analysis and a separate appraisal of available data for workforce planning (Haase & Batchelor, 2014; Haase & James, 2016). Both reports and *Smile agus Sláinte* recognise the paucity of meaningful and contemporaneous workforce data and highlight the need for more robust data collection. This study builds on these reports by mapping available workforce indicators in Ireland using a WHO framework. While the data collected allow us to start painting a picture of the GDP workforce, many gaps remain in our workforce intelligence. In the context of recruitment and retention challenges not just in state funded care, but more widely within Irish dentistry, and the implementation of *Smile agus Sláinte*, there remains however, a need for much greater data collection and monitoring of current activity as well as updated epidemiological data on levels of need in the general population. Capturing a greater range of indicators, for example, on workforce diversity and ethnicity, clinicians' hours of work, practice profiles and skill mix utilisation, as well as patient outcomes, may facilitate a greater understanding of the quality of services currently being delivered and progression and monitoring of policy implementation.

3.7.4 Policy implications

The current workforce shortages have left adult medical card holders with very limited access to routine or urgent dental care. This also leads to them having to incur greater financial hardship as they fund care out-of-pocket (McAuliffe et al., 2022). Meanwhile, the Department of Health is seeking to reform by contracting more care to private GDPs. *Smile agus Sláinte* proposes shifting care for children and vulnerable adults away from the HSE PDS and into private general dental practices, alongside existing DTSS and DTBS patients (Department of Health, 2019). The findings

of this study have direct implications for policy implementation. Based on our findings, existing DTSS contractors are qualified longer, are therefore more likely to be practising longer and potentially nearing the end of their practising careers. As highlighted already, while fewer early career dentists hold DTSS contracts, they are more likely to hold DTBS contracts, demonstrating a willingness to engage in state-funded care. Recognising the need to increase dentist workforce capacity, in 2023 the Irish Government announced its intention to increase in the number of Irish and EU undergraduate dental student places across Ireland's dental schools (Department of Further and Higher Education, 2023). Notably, this includes a new dental undergraduate programme, currently in development, which will see students receive training entirely in primary care settings, rather than a traditional dental teaching hospital (Royal College of Surgeons in Ireland, 2024). The rationale behind this approach is to fully prepare new graduates for a career in primary care dentistry, including working with disadvantaged populations (Royal College of Surgeons in Ireland, 2024). Against this backdrop, leveraging health system change (including the design of dental contracts) to maximise participation of early career dentists in state dental schemes will be crucial. While the DTBS is a 'smaller' scheme in terms of the basket of care offered and the amount GDPs are paid per course of treatment is capped at €75 (plus a patient co-payment of €15), GDPs arguably have greater clinical autonomy and freedom to offer additional treatments privately. *Smile agus Sláinte* proposes changing the way GDPs are remunerated, from fee-per-item of service to 'bundled care' or blended payments (Department of Health, 2019). International evidence suggests that GDPs can respond negatively to new models of care and provider payment methods as demonstrated by the abrupt abolition of a fee-per-item NHS contract in England and Wales, and its replacement with a bundled care contract in 2006 (House of Commons Health and Social Care Committee, 2023; M. Tickle et al., 2011). While we do not have accurate data on the cost of an average course of care under the current DTSS, a 2019 report by the Economic and Social Research Institute (ESRI) of Ireland estimates that the fee payable for an adult medical card holder package could range from €47.50 to €109.30 and from €33 to €367.83 for children (Nolan, 2019). These estimates are disaggregated by patient age bands and residential water fluoridation status and are based on 2019 DTSS fees. The extent to which GDPs will be permitted to offer additional or alternative treatments privately is unknown.

3.7.5 Limitations

While the use of secondary data allows us to gain useful insights into overall workforce trends, there are limitations to this methodological approach. Firstly, lists of DTSS and DTBS providers utilised in our analysis do not provide information on GDPs' level of clinical engagement with those schemes, if any. As highlighted in the results, up to 30% of DTSS contract holders may be clinically

inactive on that scheme at any one time. Unlike in other jurisdictions, GDPs in Ireland are not required to deliver a minimum level of care or meet annual clinical targets and they receive no capitation or continuing care payments (HSE Primary Care Reimbursement Service, 2022a). Moreover, GDPs must hold individual contracts for each practice they work in and therefore may hold multiple contracts within and across different regions. This has the potential to over-estimate the number of contractors and therefore caution is advised when interpreting these findings. Furthermore, there were no datasets available containing information on wholly private GDPs. This meant we could not compare GDP contractors and non-contractors. Additionally, we had no objective data from patients to inform the 'acceptability' indicator.

Our analysis of contract distribution focusses on two health regions only. These regions capture a range of counties and include remote, rural and coastal areas with varying degrees of deprivation, which are highlighted in the NOHP as being underserved, and where initiatives to encourage the redistribution of oral healthcare professionals will be required. Indeed, the recently published WHO Global Strategy and Action Plan on Oral Health asks member states to *"explore how to optimize private oral health care providers' engagement in [contracting and/or reimbursement] schemes"* (World Health Organization, 2024). While our findings expand on and provide a more detailed analysis of the GDP workforce in these regions, similar research on the other regions and nationally is required to assess if findings are generalisable across the entire state. Finally, our secondary data analysis solely focusses on dentists holding state contracts and therefore does not provide for a detailed analysis of other dental healthcare professionals, for example, dental hygienists. While the importance of optimal skill mix utilisation within dental teams and the potential for direct access to dental hygienists in improving access to preventative care are highlighted within the NOHP and echoed in the WHO Global Strategy and Action Plan on Oral Health (2024) (World Health Organization, 2024), data relating to these groups are not available in Ireland (except for clinical dental technicians). Dental hygienists are not eligible to hold state-funded contracts therefore data relating to their participation in these schemes, if any, is not readily available. This precluded a detailed subset analysis of this group.

3.7.6 Recommendations for future research and practice

This health systems analysis highlights the requirement for improved and contemporaneous oral health workforce data collection in Ireland. There remains no accurate head count of practising dentists or indication of their clinical commitment or hours of work. The register of dentists held by the Dental Council is the single authoritative workforce database however it does not differentiate between dentists living and working in Ireland and those who are not, nor does it differentiate between practising and non-practising dentists, for example, academics. As dentists are required

to register with the Dental Council on an annual basis, this presents an opportunity to capture key demographic and professional data which might be utilised to inform improved workforce intelligence and subsequent planning (Dental Council of Ireland, 2022). Another mandatory requirement to practise is possession of professional indemnity insurance, which is normally based on sector of work (e.g., general dental practice) and hours of work per week (Dental Council of Ireland, 2022). For researchers and policymakers, collaboration with indemnity organisations on these data might present another opportunity to gain access to key information on dentists' work patterns. Only with such data combined with data on all other oral health professionals, including a better understanding of the composition, characteristics and behaviours of primary care dental teams, can the reform committed to by government be delivered. A cross-sectional survey capturing practice-level data, for example productivity (including case mix and public/private split), skill mix utilisation and role delegation might help bridge a workforce intelligence gap. This is an urgent first step on the pathway to reform.

3.8 Conclusions

Engagement of private GDPs in state funded dental schemes is central to service reform and successful policy implementation, alongside improved workforce data collection and intelligence. The proposed *Smile agus Sláinte* reorientation of services will place a greater onus on private GDPs to care for vulnerable populations at a time when there is growing professional dissatisfaction with existing schemes (Irish Dental Association, 2023b). There is a need not just to retain current private GDPs providing publicly funded care, but to attract new practitioners into schemes and retain them also. There is significant potential for a lack of GDP supply and stock into the public system as the Irish Government seeks to implement changes and meet its WHO obligations on UHC for oral health and global commitment on ethical workforce recruitment.

3.9 Chapter summary

This chapter is based on a documentary and secondary data analysis which was published in the form outlined above in June 2025 in BMC Health Services Research (Leavy, Fleming, et al., 2025). The chapter has provided an outline of the methods, data sources, analysis and findings of the first study of this PhD thesis. These findings provide an overview of Ireland's primary oral healthcare system and its origins. It provides an overview of available workforce indicators relevant to GDPs and contracted primary oral healthcare mapped against the WHO AAAQ workforce framework. This study details the declining number of GDPs holding and clinically engaged with the DTSS for low-income adults and highlights some of the trends over time as well as characteristics of GDPs by contracts held. This chapter sets the scene for the following two studies - a realist review and

realist interview study which will explore why and how health system factors influence GDPs' participation in state-contracted care, thus providing a causal explanation for the findings in this chapter.

Chapter 4 Study 2: Realist review of private GDPs' participation in state-funded, contracted primary oral healthcare

Publication:

How and why do health system factors influence general dentists' participation in publicly funded, contracted primary dental care services: A realist review

Paul Leavy[1], Sophie Mulcahy Symmons[2], David Mockler[3], Pádraic Fleming[4], Blánaid Daly[5], John Ford[6] and Sara Burke[1]

Author affiliations:

1. Centre for Health Policy and Management, Trinity College Dublin, Dublin 2, Ireland
2. UCD Centre for Interdisciplinary Research Education and Innovation in Health Systems (UCD IRIS Centre), School of Nursing Midwifery and Health Systems, University College Dublin, Dublin, Ireland
3. John Stearne Medical Library, Trinity College Dublin, St James's Hospital, Dublin, Ireland
4. Trilateral Research - Ethical AI, Waterford, Ireland
5. School of Dental Science, Trinity College Dublin, Dublin 2, Ireland
6. Wolfson Institute of Population Health, Queen Mary University of London, London, UK

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4.1 Chapter outline

This chapter presents the second study of this thesis, a realist review of how and why health system factors influence private GDPs' participation in state-funded, contracted primary oral healthcare. This realist review was conducted in 2023-2024 and resulted in the *publication "How and why do health system factors influence general dentists' participation in publicly funded, contracted primary dental care services: A realist review"* in the journal Health Policy (Leavy, Symmons, et al., 2025). The body of text presented in this chapter is taken directly from the published article and therefore uses the term 'we' throughout when discussing the research process. I would like to clarify here that as is customary for multi-authored articles, it was composed on behalf of the team of authors and hence uses 'we' throughout. The team of authors comprised me and four of my current and former PhD supervisors and others. The majority of the research conducted as part of this study and all drafting were undertaken by me as first author with support and guidance provided by the rest of the team.

Supporting data utilised in the construction of CMOCs, for example, quotes from source publications which were not published in the article, along with the study protocol published on PROSPERO, search strategies, inclusion/exclusion criteria and coding data are available in the Appendices. This additional information was published in Health Policy as supplementary data and on the PROSPERO website (https://www.crd.york.ac.uk/PROSPERO/view/CRD42023391110). Please note, as per the study protocol, it was originally intended to include other dental healthcare professionals (DHPs), for example dental hygienists in the realist review, however owing to changes in my supervisory team and resource/time limitations, this was streamlined to include dentists only.

As outlined in chapter two, this study follows the stages of a realist review described by Ray Pawson (R. Pawson, 2006). Briefly, a rough initial programme theory (IPT) was developed, following which a systematic literature search was undertaken with the help of a medical subject librarian. Adjunctive searches including grey literature searching were later undertaken iteratively. Following screening and selection of articles meeting inclusion criteria, coding of data was undertaken using NVivo 12 Plus. Data were subsequently extracted and synthesised into 24 CMOCs which were combined and merged into six consolidated CMOCs. These were then used to inform an overarching final programme theory to explain the review's findings at a high level of abstraction.

As per Trinity College Dublin's PhD and Publication guidelines as laid out in the School of Medicine Postgraduate Research handbook, a copy of this publication is available in Appendix X: Published works.

4.2 Abstract

Objectives

To identify health system contexts and mechanisms influencing general dental practitioners' (GDPs) participation in state funded, contracted primary oral healthcare.

Methods

Peer-reviewed articles and other sources were identified via EMBASE, Medline (OVID), Web of Science and Google Scholar databases, grey literature search, citation tracking and expert recommendations. Studies meeting the inclusion criteria were assessed for rigour, relevance and richness, and coded to identify data relating to contexts, mechanisms and outcomes. Inductive and deductive coding was used to generate context–mechanism–outcome configurations (CMOCs) and develop the final programme theory.

Results

Database searching identified 1,844 articles of which 29 were included. A further 33 sources were identified through adjunctive searches. Analysis identified key systems contexts influencing GDP participation. These include system emphasis on treatment over prevention, low priority for oral healthcare, funding constraints, and change implementation with minimal clinician consensus. At operational level, contracts can restrict GDP decision-making and ability to deliver high quality and holistic patient care. Key underlying mechanisms were feelings of ceded clinical and entrepreneurial control, stress and demoralisation, mistrust of the system and feeling undervalued.

Conclusions

The factors influencing GDP participation in state-funded, contracted dental care over private dental care are complex. The findings presented in this review have the potential to act as a good place to start leveraging health system change including better GDP engagement and increase participation in publicly funded systems.

Keywords Dentist, Oral health, Primary care, Workforce, Policy

4.3 Background

Oral diseases including dental caries remain some of the world's most prevalent, and largely preventable non communicable diseases (NCDs), affecting up 3.5 billion people globally (World Health Organization, 2022a). This disease burden is likely to increase as populations grow, and individuals retain their natural dentition into old age (Jain et al., 2024). Recognising this global burden and the widespread variability in levels of oral healthcare coverage, United Nations (UN) member states agreed to adopt the World Health Organization (WHO) resolution on oral health at the 74th World Health Assembly (WHA) in 2021 (World Health Organization, 2022c). This landmark agreement seeks to embed oral health within NCD and universal health coverage (UHC) agendas and acted as the springboard for the development of the Global Strategy and Action Plan on Oral Health (2024) (World Health Organization, 2024). The overarching vision of this strategy is the development of UHC for oral health by 2030 and in tandem with a preventative, public health approach to oral health, it advocates for the integration of oral health into mainstream primary care services.

As one of the six 'building blocks' of health systems, sufficient workforce capacity is recognised as key in ensuring availability and accessibility of services and patients have timely access to care (World Health Organization, 2010a). As frontline healthcare professionals, primary care dentists remain the cornerstone of oral healthcare services with most care delivered in general (family) dental practices (Ziller, 2008). Worldwide, health systems have established models where state-financed or insured primary dental care is delivered by independent, mainly self-employed general dental practitioners (hereinafter, referred to as 'GDPs') working in independent ('private') dental practices under contract to state health authorities. Examples include National Health Service (NHS) General Dental Services (GDS) across the United Kingdom (UK)(Tickle, 2012) and the Health Service Executive (HSE) Dental Treatment Services Scheme (DTSS) in Ireland (Woods et al., 2017). Under these arrangements, GDPs agree to treat patients according to terms and conditions set by state health authorities and rates of remuneration are often fixed or capped.

There are long standing and well documented challenges regarding GDP participation in state funded, contracted dental services (D. Evans et al., 2023). In Ireland, the number of GDPs participating in the DTSS, a scheme which serves low-income adults, has steadily declined, from 1,664 in 2016 (HSE Primary Care Reimbursement Service, 2017), to just under 800 in 2023 (HSE Primary Care Reimbursement Service, 2023b). In England, despite the number of NHS GDS contracts remaining largely unchanged since 2017, the volume of treatments delivered and patients receiving care has fallen as private GDPs reduce their NHS commitment (Williams et al.,

2023). Consequently, timely access to routine care for patients may be impeded, presenting a significant challenge to health policymakers and health service managers (Williams et al., 2023).

Workforce challenges in healthcare span all settings and specialties and are often described as complex (Humphries et al., 2019; World Health Organization, 2022b). Solving these challenges rarely entails a single 'silver bullet' intervention but necessitates a deeper understanding of complex whole system factors and how these influence the behaviour of the system and aspects of it, including the workforce. In workforce planning, researchers and policymakers are increasingly adopting a 'systems thinking' approach which considers the various complexities, feedback and delays between decision making and change implementation (Brocklehurst & Tickle, 2012; Masnick & McDonnell, 2010). From a policy perspective, the use of the private sector workforce may be viewed as an efficient means of creating clinical capacity within health systems (Hellowell, 2020), however models of contracting primary dental care rely on a steady supply of GDPs voluntarily opting into or remaining in such services. In contrast to directly operated state funded salaried dental services (frequently referred to as public or community dental services) (O'Selmo et al., 2020), general dental practices operate as businesses where capital assets and staff are held and managed outside the state system, within the private sector (Brocklehurst et al., 2016).

While there is a considerable body of literature highlighting a range of factors influencing GDPs' participation in publicly funded services or programmes, these are often focussed on contract or programme-level features. In England, for example, the 2006 NHS GDS contract has proved unpopular with GDPs owing to unfavourable terms and conditions of service, namely the requirement to deliver annual clinical targets set by NHS commissioners in return for a fixed sum of remuneration (D. Evans et al., 2023; Holloway & Chestnutt, 2024). In the United States, general dentists' participation in public insurance 'safety net' programmes for low-income populations, namely Medicaid and Children's Health Insurance Program (CHIP), has also proved challenging for policymakers and health service managers with low reimbursement rates frequently cited as the main barrier to participation (Arevalo et al., 2020; Beazoglou et al., 2015; Kaiser Family Foundation, 2008; Maxey et al., 2022).

Literature on how and why system-level contextual factors affect GDP engagement with state-funded dental care globally is limited. This knowledge gap is important in the context of UN member states meeting their international obligations on oral health and ensuring there is sufficient workforce capacity to meet population needs. Action point 62 of the WHO Oral Health Strategy and Action plan makes specific reference to *"including private oral health providers through appropriate contracting and/or reimbursement schemes"* and asks member states to

"explore how to optimize private oral health care providers' engagement in such schemes" (World Health Organization, 2024).

For this review, our primary focus is on understanding factors that influence GDPs' participation in state-funded care from a health systems level perspective. Given the requirement for a deeper understanding of this complex topic, a theory-driven realist review from the school of Pawson and Tilley was adopted (Pawson & Tilley, 1997). This approach synthesises existing published and grey literature with the aim of identifying underlying, hidden causes for observed outcomes. In realist-focussed research, the inquiry is often framed as: 'what works (or happens), how, why, for whom and under what circumstances'? (Pawson & Tilley, 1997). Realist reviews are particularly useful for investigating or 'diagnosing' complex phenomena or problems (Duddy & Wong, 2023). They examine specific contexts ('C') in which certain hidden mechanisms ('M') are triggered (or modified) to result in given outcomes of interest ('O'). This is known as realist logic of analysis (Wong, 2018b) (C + M = O) and the interplay or causal relationship between these and the building blocks for realist reviews are referred to as 'Context – Mechanism - Outcome Configurations' ('CMOCs'). These are then refined and utilised to create an overarching or final programme theory to explain or help understand the phenomena of interest.

This realist review sought to answer the following question: how, why, for whom and under what circumstances do health system factors influence general dental practitioners' participation in state (publicly) funded, contracted primary oral healthcare services?

4.4 Methods

This realist review was conducted with a predetermined, endpoint outcome of interest (GDP participation in state funded, contracted primary dental care) and with a focus on high-level health systems features. Adopting a realist review deepens our understanding of this complex topic by identifying health systems contexts and hidden causal mechanisms that are not easily measurable, and which may not have been fully explored in other studies. This review adhered to a study protocol based on Pawson's iterative stages (R. Pawson et al., 2005) (Figure 13) and followed the RAMESES realist review standards (Geoff Wong et al., 2013).

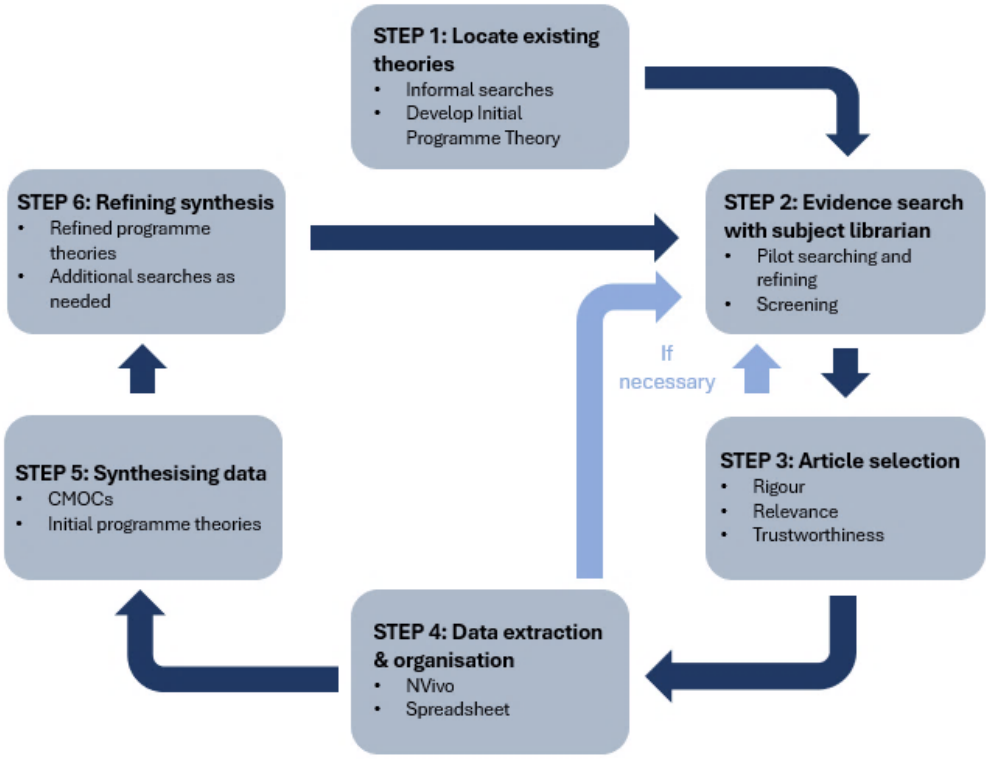


Figure 13: Realist review stages

4.4.1 Project advisory group

A project advisory group (PAG) was established from the outset to consider emerging findings of the review. The PAG comprised the immediate research team, oral health services and policy researchers (n=2), health systems researcher (n=1), frontline clinicians (n=3), civil servant (health workforce planning) (n=1) and patient and public involvement (PPI) representatives (n=2). Engagement took place via Microsoft Teams videoconferencing platform over two meetings in May 2023 and June 2024 where emerging findings and theories were presented to stakeholders and they had the opportunity to confirm, refine, or refute these, based on their knowledge and

experience. The use of external stakeholder groups in realist reviews is an established and recommended practice (Power et al., 2024).

4.4.2 Initial programme theory

To inform the literature search strategy, a rough initial programme theory (IPT) was developed by PL and subsequently discussed with PF (Appendix 3). IPTs are used as a starting point for realist reviews and constitute a prior understanding of how phenomena or outcomes occur. An IPT may be based on preliminary reading of the literature, or the expertise of stakeholders (Duddy & Wong, 2023). This was informed by informal reading of literature and the research team's existing knowledge of dental and wider health workforce and health systems. The IPT listed potentially important contexts (e.g., lack of financial incentives) and mechanisms (e.g., stress and burnout) impacting the outcome of private GDP participation in state funded, contracted dental care. Literature was identified through an exploratory desktop internet search using Google search engine and included published articles, government reports, news, opinion articles and blogs published by dental professional representative organisations.

Thereafter, a series of 'if, then, because' statements were constructed in realist terms to further elucidate potential contexts and mechanisms (Appendix 4). These, and the IPT were shared with stakeholders and utilised to stimulate discussion during the first PAG meeting.

4.4.3 Searching

With the assistance of a subject librarian (DM), a formal search strategy of peer-reviewed, published literature was developed (Appendix 5), and searches were undertaken across four online databases: EMBASE, Google Scholar, Medline (OVID) and Web of Science within the date range 1 January 2000 to 15 March 2023 when searches were conducted. There were no restrictions on study designs or sources eligible for inclusion in this review. Search results were imported to EndNote™ 20 reference management software and deduplicated automatically and manually.

Additional searches were later undertaken iteratively in the form of citation tracking of included studies and internet searching of relevant grey literature. These took place between May and July 2024. The primary purpose of adjunctive searches was to identify supplementary material relevant to both health systems contexts and mechanisms to build upon our emerging CMOCs.

4.4.4 Selection and appraisal of documents

Studies or sources were included based on relevance to the review question, that is, if they provided relevant information or data about GDP participation in state-funded, contracted primary

dental care and would contribute to the development and refinement of programme theory. Only studies related to the OECD region and those written in English were included. All titles and abstracts were screened by PL using COVIDENCE online systematic review tool with SMS independently blind-screening a 10% random sample for consistency (and again during full text screening). An initial assessment of relevance, rigour, and data richness (for definitions, see glossary in supplement) was undertaken during the screening phase and as additional literature was collected.

4.4.5 Data extraction and analysis

Following the screening process, study characteristics were collated using a Microsoft Excel spreadsheet. Characteristics included publication year and country, study aim and design. Thereafter, relevant text excerpts from included articles were coded using NVivo 12 Plus qualitative data analysis software. Coding was carried out both inductively from data emerging from studies and deductively based on a series of concepts derived from the initial programme theory. Codes were subsequently grouped by concept, for example 'remuneration and funding', 'quality care' and 'control' and assigned labels of 'context', 'mechanism', or 'outcome'. As the analysis progressed, codes were refined and merged based on emerging findings. Coding categories and emerging concepts were reviewed by research team members, and senior supervising authors PF and JF.

Realist logic was then utilised to analyse data from included studies and construct CMOCs. The analysis commenced with our endpoint outcome of interest and tracked backwards along the C-M-O pathway. Patterns emerging with some regularity ('demiregularities'(Geoff Wong et al., 2013)) when mechanisms are triggered (or activated) in certain contexts were identified.

The analysis was iterated over a period of 6-9 months where the causal relationships between contexts, mechanisms and outcomes were investigated. A total of 24 individual CMOCs (Appendix 9) were developed and subsequently grouped together into the six consolidated CMOCs described below. CMOCs were subsequently utilised to develop the final programme theory.

4.5 Results

4.5.1 Search results and study characteristics

In total, after deduplication, 1,844 titles and abstracts were screened following which 208 peer-reviewed articles were deemed eligible for full text review (Figure 14). During reading of full texts, a further assessment of relevance, rigour and data richness was undertaken, and 179 articles were deemed not to have met standards and were therefore excluded. Twenty-nine (29) peer-reviewed articles, mostly from the UK were included. Owing to the endpoint outcome being predetermined, searches were focussed on identifying mechanistic-rich data. Through content expert recommendations, forward and backward citation tracking and adjunctive literature searching using Google and various organisations' websites, an additional 33 sources including peer-reviewed articles and 'grey' literature were identified from the UK, Ireland, USA and elsewhere including the OECD and Europe regions. A breakdown of study and data source characteristics is provided in table 4.

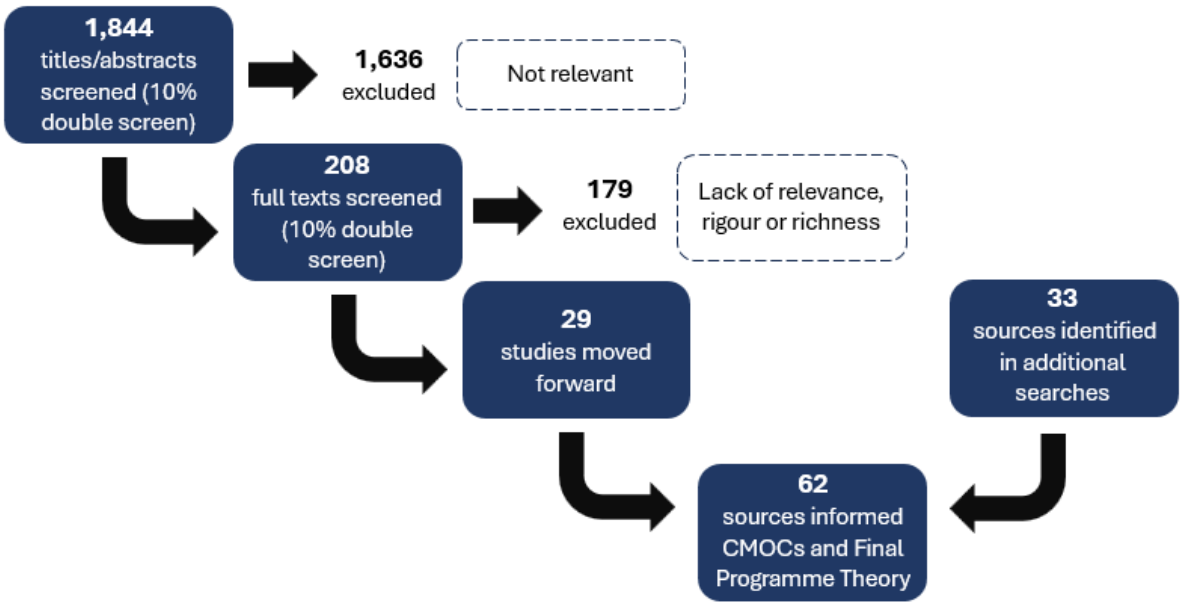


Figure 14: PRISMA diagram

Table 4: Summary of included studies and sources providing data for CMOCs (full list available in supplemental data)

Study/source characteristics	**Number of studies/sources**
Country or region	
UK	41
Ireland	8
USA	3
USA and Canada	1

Europe (Region)	1
Global or non-specific	8
Study/source type	
Peer reviewed published journal articles	
Qualitative	21
Quantitative	4
Mixed methods	10
Review article	2
Other (e.g., descriptive paper)	5
Grey literature	
Academic report	6
Other report	4
Editorial/opinion article	3
Other (e.g., health service website)	7
Participants or focus	
Dentists only	22
Health service leaders/managers/decision makers only	3
Mixed populations	9
Health system or other	28
Year of publication	
2000-2005	3
2006-2011	19
2012-2017	9
2018-2024	31
Total	62

4.5.2 Context–mechanism–outcome configurations

The following CMOCs are the key findings from this realist review.

4.5.2.1 CMOC 1: Quality care and job satisfaction

The first CMOC (Figure 15) examines the context where health systems are under pressure to contain costs and increase efficiencies due to fiscal constraints or austerity measures (Fleming, Caffrey, et al., 2022; OECD, 2015; Williams et al., 2023), and which focus on dental care models that are primarily treatment-intensive (rather than preventative) and focussed on delivery by dentists (rather than wider dental team members) (Barrow et al., 2023; Benzian et al., 2011; House of Commons Health and Social Care Committee, 2023; Watt, Daly, et al., 2019; Winkelmann, Gómez Rossi, et al., 2022). Where state-funded services are provided by GDPs on behalf of state health authorities, restrictions are often built into contracts as a means of containing exchequer costs (McAuliffe et al., 2022; Williams et al., 2023; Winkelmann, Gómez Rossi, et al., 2022). These may limit the quantity of treatments that GDPs can offer patients on public contracts (Department of Social Protection, 2023b; Flanagan, 2022) as well as directly or indirectly limiting the types of treatment they can offer, for example, by prohibiting the use of certain restorative materials or through fee constraints (Allen et al., 2020; Baird et al., 2007; Brocklehurst et al., 2016; Flanagan, 2022; The Scottish Parliament, 2010).

Operating within this context can trigger feelings of pessimism among GDPs because they perceive an inability to offer their patients care that they consider to be high quality, contemporary or comprehensive (Allen et al., 2020; Burford et al., 2023; Gallagher et al., 2009; Gallagher et al., 2021b; Houses of the Oireachtas, 2024a; McDonald et al., 2012a; Steele et al., 2009; Taylor-Gooby et al., 2000; Thomson et al., 2021). GDPs may be less likely to feel a sense of satisfaction (reward) or pride in their work (Burford et al., 2023; Steele et al., 2009) and experience increased professional dissonance (Fleming, Caffrey, et al., 2022) – discomfort arising from conflicting professional values and expected or required job tasks (Calnan et al., 2000; Gallagher et al., 2009; Gallagher et al., 2021b; Murray, 2002; O'Selmo et al., 2019).

"... [Under the new contract] I find it difficult to take pride in my work any more" (Steele et al., 2009)

Additionally, while working within public contracts may afford early career GDPs experience delivering a range of routine treatments, long term commitment may be perceived as disadvantageous for developing more complex clinical skills and for career progression (Burford & Vance, 2022; Gallagher et al., 2009; Gallagher et al., 2021b; Willett & Palmer, 2009).

These mechanisms can prompt GDPs to reduce their commitment on public schemes or seek employment elsewhere, for example, 'wholly private' practice where fewer restrictions may exist.

4.5.2.2 CMOC 2: Pressure, demoralisation, and burnout

The second CMOC (Figure 15) explores contexts where cost containment measures embedded within contracts or programmes such as capped remuneration in return for delivering an agreed volume of bundled care or where fee for service reimbursement rates are low compared to private or 'out of pocket' (market) fees, incentivise or drive GDPs operating as independent contractors to deliver a high volume of treatments or treat a large volume of patients, often over a short time period (Gallagher et al., 2009; Gallagher et al., 2021b; Harris et al., 2011; Hill et al., 2010).

> *"They reported feeling thwarted by the higher volume targets that they had to achieve within a limited timeframe in order to meet practice and personal financial commitments"* (Gallagher et al., 2021b)

This can trigger feelings of stress as GDPs come under pressure to maintain productivity and profitability or achieve clinical targets set by health authorities (Gallagher et al., 2009; Gallagher et al., 2021b; Harris, Perkins, et al., 2015; Harris et al., 2011; Hill et al., 2010). Time pressures may also compound the mechanisms in CMOC 1, especially when GDPs' workloads are treatment-intensive ('drilling and filling') or do not facilitate provision of holistic patient care. These pressures can be compounded further where GDPs provide care for dental corporate bodies as sub-contractors (Gallagher et al., 2021b; O'Selmo et al., 2018; O'Selmo et al., 2019). Over time, this can result in demoralisation and burnout (Denton et al., 2008; Gallagher et al., 2021b; Toon et al., 2019) which can lead GDPs to step away from providing care on public contracts.

4.5.2.3 CMOC 3: Clinical autonomy and control

CMOC 3 (Figure 15) describes a context in which there is a strong health systems emphasis on delivering care cost-effectively ('doing more with less') and ensuring value for taxpayers' money (Harris, Perkins, et al., 2015; National Audit Office (NAO), 2011). Embedded within public dental contracts may be structures or processes that restrict GDPs' local decision-making as a means of standardising or ensuring equitable access to care (Harris, Perkins, et al., 2015), for example use of clinical targets for remuneration, qualifying conditions, or prior authorisation for some treatments (Brocklehurst et al., 2020; HSE Primary Care Reimbursement Service, 2022a; The Scottish Parliament, 2010). Responsibility for allocating resources and operationalising contracts may be delegated to commissioners or health service managers (and their teams) who negotiate, issue, and/or administer contracts including approving treatments or payments to GDPs (Brocklehurst et al., 2020; HSE Primary Care Reimbursement Service, 2022a; NHS National Services Scotland, 2023).

In these systems, often characterised by a high degree of oversight and accountability driven by leaders and managers higher up in health authority hierarchies, contract managers or commissioners can come under pressure and scrutiny to deliver services efficiently through effective negotiation of contracts and monitoring GDPs' performance or outputs (Harris, Perkins, et al., 2015; Holmes et al., 2015). Pressures on commissioners or managers may be compounded when finances are tightened further and result in reduced ability on their part to interpret, 'flex' or 'bend' contract rules to facilitate their own interests or needs as well as GDPs' (Harris, Perkins, et al., 2015; Vernazza et al., 2019).

These factors, reinforcing a culture of 'external' oversight and accountability, can trigger feelings of frustration among GDPs and disengagement with the system because they perceive a loss of clinical control or professional autonomy and decision-making power (Allen et al., 2020; Baird et al., 2007; Gallagher et al., 2009; Gallagher et al., 2021a; Harris & Holt, 2013; Harris et al., 2011; McDonald et al., 2012). These feelings may be reinforced by contract rules and regulations which are perceived as onerous or 'bureaucratic' (Collin et al., 2019; Harris, Perkins, et al., 2015; Reynolds et al., 2019; Steele et al., 2009).

Over time, this can have the effect of pushing some private GDPs away from the public 'system' towards private only care where fewer contract restrictions exist or there is less external oversight or accountability.

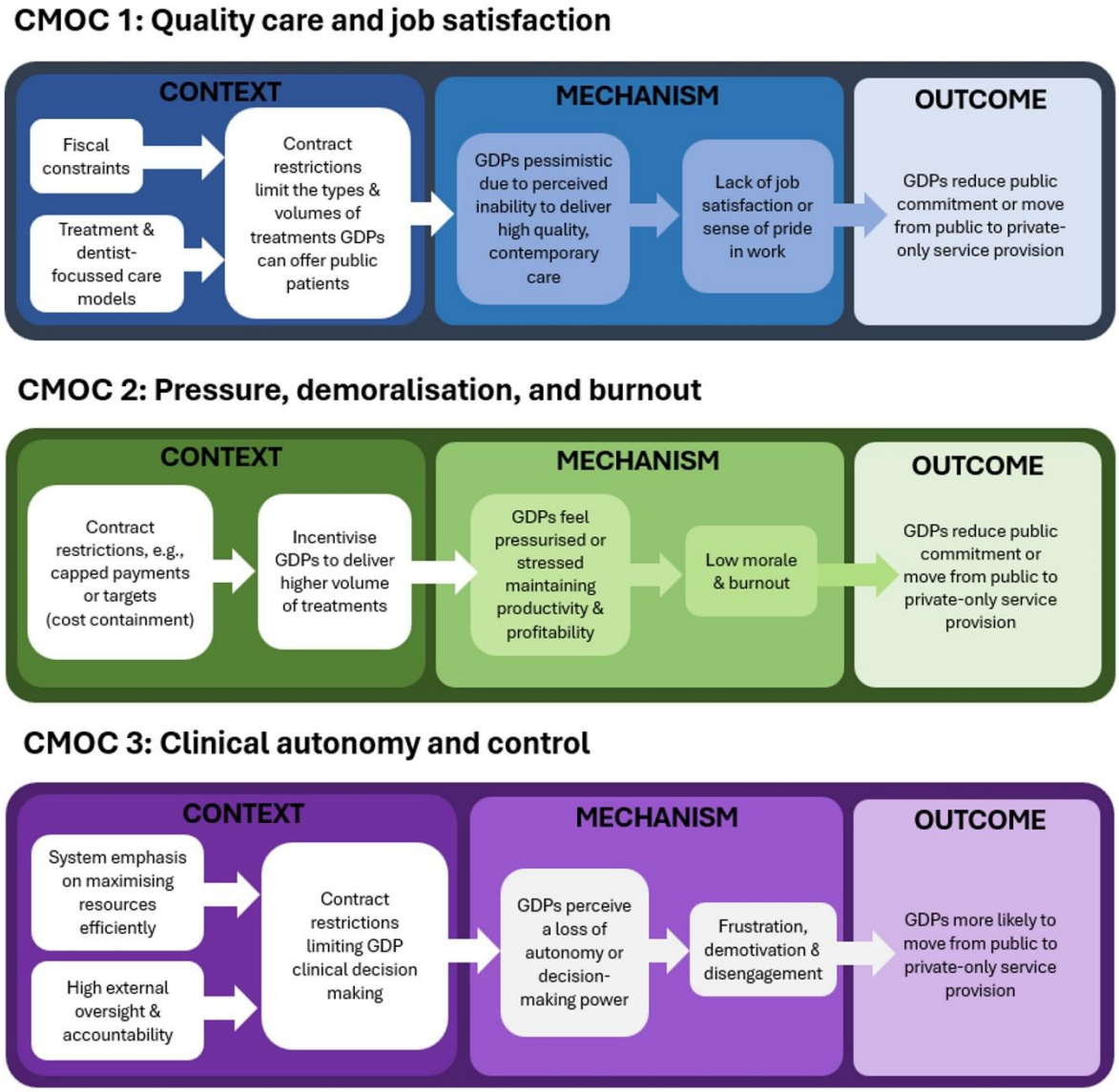


Figure 15: CMOCs 1-3

4.5.2.4 CMOC 4: Consensus, business control and trust

The fourth CMOC (Figure 16) addresses contexts where contracts are proposed, implemented, operationalised or revised with minimal meaningful consultation, communication, co-design or consensus with the frontline profession (House of Commons Health and Social Care Committee, 2023; House of Commons Health Committee, 2008; Irish Dental Association, 2021), and where terms and conditions are perceived as being unfair or less favourable compared to previous arrangements (Harris et al., 2011; House of Commons Health Committee, 2008; Taylor-Gooby et al., 2000), resulting in opposition from GDPs' and wider professional networks (Dharamsi et al., 2007; House of Commons Health and Social Care Committee, 2023; McDonald et al., 2012). Against a backdrop of austerity or tightened financial conditions and low levels of political priority for oral healthcare, contract changes and cuts in spending of dental services (which are often considered separate from wider healthcare services (Balasubramanian et al., 2019)), may be disproportionate and occur sooner than other services (Johnston et al., 2020; Watt, Daly, et al., 2019; Woods et al., 2017).

This context can trigger or reinforce feelings of eroded entrepreneurial or business control(Harris et al., 2011), disappointment (Harris et al., 2011) and suspicion or mistrust (Blinkhorn et al., 2008; Burford et al., 2023; Harris, Garner, et al., 2015; Harris, Perkins, et al., 2015; McDonald et al., 2012; Steele et al., 2009) of those governing the health system leading to demotivation (Harris et al., 2011) and disengagement with the system. These feelings may be felt more prominently among GDP principals or practice owners who have invested in practice capital (held outside the health service) and who hold responsibility for running a business (Allen et al., 2020; Davies & Macfarlane, 2010; Gallagher et al., 2021b; Harris & Holt, 2013; Taylor-Gooby et al., 2000). Wariness or mistrust may be reinforced by regulations perceived as punitive in nature, for example 'clawback' of funds for missed clinical targets (Gallagher et al., 2021b; Harris, Garner, et al., 2015; Steele et al., 2009) and amplified by messages transmitted by others within GDPs' professional networks including stories of perceived historical maltreatment by the state, which may be passed down through generations of practitioners (Gallagher et al., 2009; Harris, Perkins, et al., 2015; Holmes et al., 2009; McDonald et al., 2012).

> *"I suspect whoever came up with them [regulations] tried to make them as ambiguous as possible (perhaps with the intention of tripping up providers when the day of judgement comes)"* (Harris, Garner, et al., 2015)

This can have the effect of pushing some GDPs away from the public 'system' towards private only care where fewer contract restrictions exist or there is less external influence.

4.5.2.5 CMOC 5: Transactionality and opportunism

CMOC 5 (Figure 16) looks at the context where contracts are perceived as being unfair or unreasonable (Burford et al., 2023; Davies & Macfarlane, 2010; McDonald et al., 2012), and where commissioners or contract managers' have difficulties communicating the terms or rationale of a contract or engaging constructively with GDP contractors (Harris, Perkins, et al., 2015) and there is a lack of expertise within or resourcing of their teams (Holmes et al., 2009; House of Commons Health Committee, 2008; Vernazza et al., 2019). Against this backdrop, there may be opposition and reinforcing messages surrounding contracts from GDPs' professional networks (Gallagher et al., 2009; Harris, Perkins, et al., 2015; Holmes et al., 2009). Additionally, some GDPs may not see their own internally driven goals or values reflected in the contract or by those governing the system (Harris & Holt, 2013; Harris, Perkins, et al., 2015; O'Selmo et al., 2019).

In this context, some GDPs may feel less willing to engage benevolently with the health system (Harris et al., 2011). GDPs may disengage with the system by remaining in it, but do not commit to the overall strategic aims of the contract (Batchelor, 2009; McDonald et al., 2012). They may treat the contract either in a transactional manner to ensure they do not lose out financially and for the good of their practices (Davies & Macfarlane, 2010; Harris, Perkins, et al., 2015; McDonald et al., 2012; Steele et al., 2009), or view it as something which can be exploited for financial or personal gain (Goodwin et al., 2018; Harris et al., 2011).

Where they exist, some GDPs will utilise loopholes, grey areas, or perverse financial incentives within contracts because they perceive this to be a legitimate response to unfavourable contract terms (Martin Tickle et al., 2011). Examples of such behaviours include selecting or tailoring their case mix (e.g., patients with lower unmet needs) or undertaking select procedures only (Reynolds et al., 2023).

4.5.2.6 CMOC 6: The value of state funded dental care

The sixth, and final CMOC (Figure 16) examines the context where there is an absence of political and health systems priority for, and investment in primary care dentistry (Benzian et al., 2011; Holmes et al., 2009; McAuliffe et al., 2022; Watt, Daly, et al., 2019) (compared to other health or oral health services, which may garner greater political interest owing to societal demand) and where there is limited societal importance placed on routine oral healthcare (Gallagher et al., 2007), but where there may be strong market demand for non-routine, 'cosmetic' care (Harris, Perkins, et al., 2015; Patel, 2021). Furthermore, there may be stigma and denigration of state funded dental care among the profession (Gallagher et al., 2009; Harris & Holt, 2013; Logan et al., 2015), and some within wider society (Steele et al., 2009; Westgarth, 2022), where it may be perceived as 'second rate/tier'.

In this context, and where contracts feature patient co-payments (as a means of controlling demand and containing costs), but where these are low compared to private fees (or patients are exempt from payment), some GDPs can feel undervalued as professionals because they perceive that patients (Gallagher et al., 2007; Gallagher et al., 2009; Gallagher et al., 2021a; O'Selmo et al., 2019; Reynolds et al., 2019), or the state do not value them (as dentists providing state funded care) or state-funded dental care itself (Dharamsi et al., 2007; Gallagher et al., 2009; Steele et al., 2009; Willett & Palmer, 2009) or appreciate the high costs of delivering care, for example if patients question the cost of co-payments (set by the health authority) or do not attend their appointments (Davies & Macfarlane, 2010; Reynolds et al., 2019).

> *"The largest problem I see is patients do not value what they are receiving from DWP (or [Medicaid]…They have no idea that there is a cost of doing business"* (Reynolds et al., 2019)

This can cause GDPs to move away from public care provision towards private-only care or non-routine care (e.g., facial aesthetics) where there may be greater appreciation for services provided.

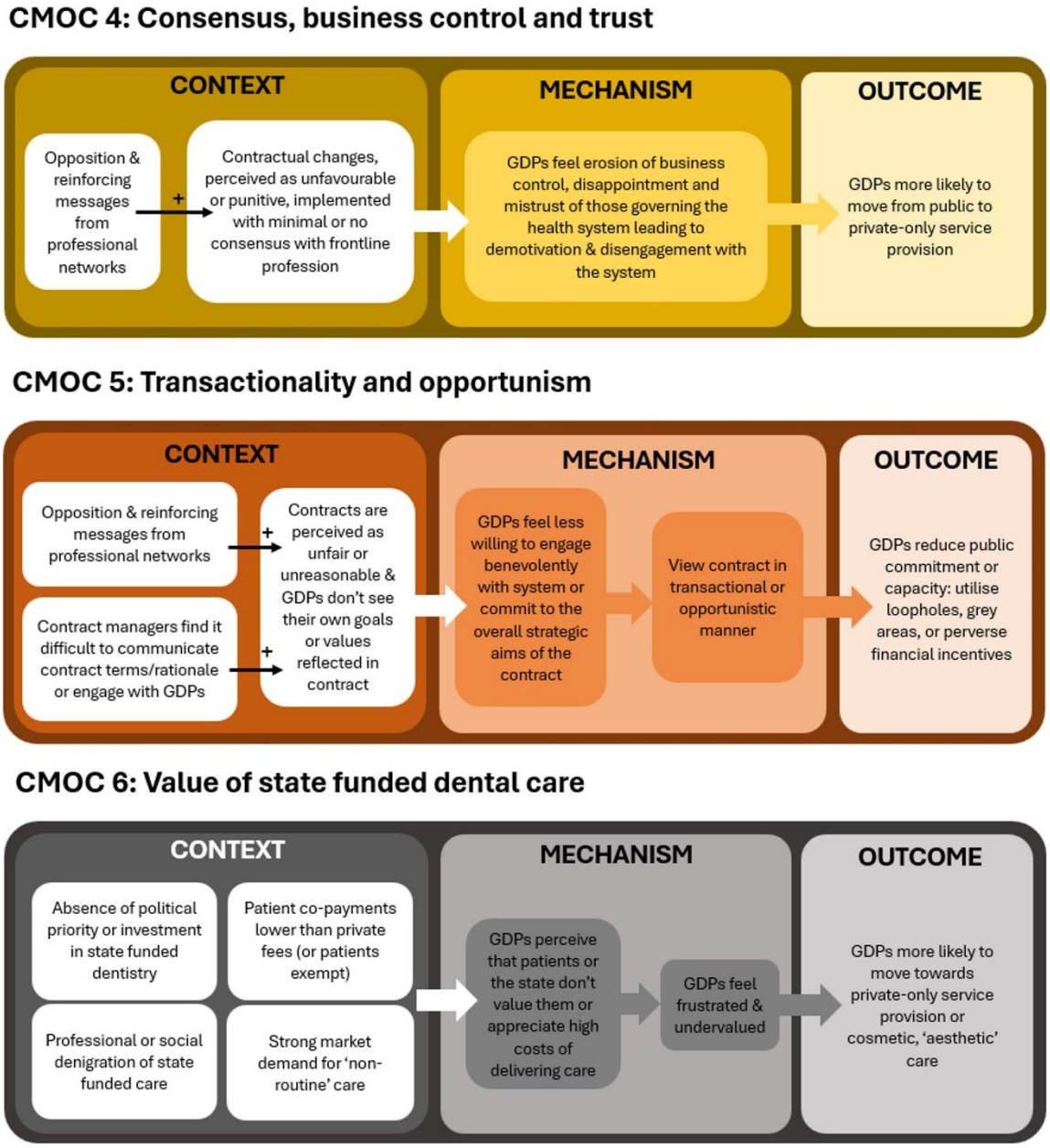


Figure 16: CMOCs 4-6

4.5.3 Final Programme Theory

The final programme theory is informed by the six separate, but inter-linked CMOCs (Figures 15 and 16). Each contextual factor relates or can trace its origin to oral health policies where primacy is given to treatment-intensive, dentist-centred care models and their knock-on effect on the functioning of state-funded primary dental care services which rely on GDP-contractors. Jurisdictions in which this programme theory holds most relevance are those impacted by a lack of political priority for oral healthcare, restrictive fiscal policies, and where health systems' emphases are on efficiency and managerialism. These high-level health system factors can have knock-on effects on how publicly funded dental contracts are designed, implemented and operationalised. How contracts and those managing them are perceived by the profession can subsequently trigger a range of sentiments and behaviours among GDPs which can then influence their decisions to provide care on behalf of state health authorities or not.

The dichotomous relationship between the continued use of contracts where the emphasis is on 'curative' care ('drilling and filling') delivered by dentists on the one hand, and the subsequent requirement to control costs and deliver services efficiency by limiting GDPs' autonomy on the other, can have a profound and negative impact on how GDPs perceive their ability to make clinical decisions in the best interests of their patients, practice the type of dentistry they want to, and maintain an income without undue external pressure. This can lead to the creation of contexts where contracts are perceived as unfair, especially where abrupt changes are made or where there is limited professional engagement or 'buy in'. Additionally, the influence of others within the wider profession in amplifying messages of unfairness, coupled with an inability or difficulty on the part of contract managers (who themselves may be resource constrained or subject to system pressures) to engage or communicate effectively with the profession, can trigger or reinforce a sense of powerlessness, mistrust of the system and agnosticism or opportunistic attitudes towards state-funded care among GDPs.

Finally, the role of perceived lack of professional value in motivating GDPs to engage with the public system is key, and is influenced by some of the aforementioned factors, namely low political priority for and investment in primary dental care as well as limited societal importance for routine oral healthcare. For frontline GDPs, the manifestation of this can come in form of low reimbursement or co-payments and non-compliant patient behaviour. This is important when state-funded primary dental care contracts exist within diverse markets where non routine and 'private' dental care may be viewed more favourably among GDPs.

4.6 Discussion

4.6.1 Strengths and limitations

A key strength of this research is that it helps fill a significant research gap, utilising a realist review to directly inform the issue of GDPs' decisions to participate in publicly-funded contracted primary oral healthcare from a broad, high level health systems perspective wherein we have unearthed modifiable contexts applicable to systems which utilise contracted primary oral healthcare models. As part of this synthesis, we utilised the RAMESES realist review standards to inform our methodology, including searching, reviewing and synthesising the literature (Geoff Wong et al., 2013). Another strength of this review is the involvement of a range of stakeholders including content experts and frontline GDPs. PAG members helped inform and strengthen our analysis by confirming, refuting or suggesting modifications to the emerging findings of our CMOCs.

Like other realist reviews, this study is reliant upon, and therefore potentially constrained by the availability of relevant literature. Furthermore, as we adopted a broad approach focussing on high level systems features, it was not possible for us to consider any and all possible factors influencing GDPs' decisions to take up or resign from public contracts (e.g., at individual or practice level *per se*). One limitation of this study is the paucity of literature and mechanistic data from outside the UK or North America. This may impact the generalisability of our findings to other health systems globally. While this shortcoming may, in part, be reflective of the search strategy, it is likely attributable to a dearth of qualitative research in this subject area from outside the aforementioned regions. Supplementary searching did not identify additional sources of mechanistic-rich or outcomes-related data from elsewhere. Another limitation of note is that the majority of peer-reviewed studies identified were weighted disproportionately towards the perspectives of individual practising GDPs who were generally dissatisfied with public care contracts. We found that peer reviewed oral health literature specifically investigating this issue from a broader health systems or policy perspective is largely lacking. Adjunctive and grey literature searches did however identify data which complement our findings with respect to health systems contexts (e.g., funding, resourcing, efficiency).

4.6.2 Meaning of this study within the body of existing literature

This realist review comes at a time when health systems are increasingly experiencing workforce shortages including in oral healthcare, notably in state funded primary care services. This has resulted in impeded access to routine care for many people, often those who need it most, including children and vulnerable adults (McAuliffe et al., 2022; Williams et al., 2023). Our findings, therefore, are timely as systems look to widen access to affordable care and reduce oral

health inequities in line with WHO commitments. In Ireland, for example, the government is implementing *Smile agus Sláinte* – National Oral Health Policy (2019) (Department of Health, 2019) which seeks greater provision of publicly funded care by private GDPs at a time when the number of dentists participating in the DTSS is in significant decline. To our knowledge, the exact reasons behind this decline have not been formally investigated through primary research but are reported to include many of the same factors identified in this review, e.g., contract constraints and funding cuts introduced during the economic downturn in 2010 (O'Neill, 2022). In the United States, factors such as burdensome programme administration and non-compliant patients (for example those who do not attend appointments) are understood to be contributory factors influencing general dentists' decisions to participate in Medicaid and CHIP (as well as low remuneration) (Greenberg et al., 2008; Kateeb et al., 2016; Nebeker et al., 2014). As part of this review however, we found that US-based literature yielded limited mechanistic-rich or broader health systems-related data pertaining to GDP engagement in government programmes there.

In England, the issue of the NHS GDS contract and its impact on patient access to care has long garnered the attention of health services researchers, the media, and politicians, most notably following the introduction of the 'new' target-based, bundled care contract in 2006. Reports of long queues to 'register' with NHS dental practices (Watt et al., 2024), increased hospital attendances due to unmet oral health needs (British Dental Association, 2023), 'DIY dentistry' (British Dental Association, 2024) and the emergence of 'dental deserts' (Thayer, 2024), especially in rural and coastal areas have pushed the issue to the top of the political agenda. This review builds upon the findings of several UK-focussed non-realist reviews, many of which highlight issues relating to GDP recruitment and retention or job satisfaction. In their 2023 scoping review exploring workforce challenges, Evans et al. found several factors affecting recruitment and retention of GDPs in the NHS (D. Evans et al., 2023). Like our review, a frequently cited factor was the NHS England contract which was described as 'fundamentally flawed' and responsible for driving dentists 'out of the profession' due to targets, high workloads and burnout. Other reported factors aligning with our findings included suboptimal remuneration and limited opportunities for career progression in primary care. In contrast to our review, other non-health systems specific factors were identified, namely practice rurality and poor transportation links. Similarly, in their 2024 literature review examining factors contributing to job dissatisfaction among UK GDPs, Holloway and Chesnutt also identified many of the same factors highlighted in our review, including restrictive contracts and associated time pressures (Holloway & Chestnutt, 2024). In contrast to these reviews and wider literature investigating dentists' perceptions, this realist review addresses an absence of

knowledge surrounding the influence of factors at health systems level on GDP behaviour and engagement.

Although theirs was not a review or primary research, in their 2012 analysis, Brocklehurst and Tickle utilised 'systems thinking' as a means of developing an oral health workforce planning tool which considered the interactions, delays and feedbacks that influence the balance between the various components of the health system (Brocklehurst & Tickle, 2012). Building upon earlier work by Masnick and McDonnell (Masnick & McDonnell, 2010), they examined the complex interactions between factors on the demand and supply side of care in the NHS and suggested that the net flow of dentists in the system was dependent on a myriad of factors including the right legislative environment and contractual arrangements, financial support and incentives, skill mix utilisation and market forces driven by people expressing a need for care.

4.6.3 Policy and practice implications

The CMOCs and final programme theory provide the basis for a series of systems-level actions that could inform meaningful change when it comes to developing and implementing new policies, strategies or service reforms, leveraging GDP engagement and increasing participation in publicly funded services.

4.6.3.1 Engagement, transparency and consensus on services

One of the main findings to emerge from this review is perceived lack of control among GDPs and apparent absence of consensus and trust between them and health systems governors. From a policy perspective, there is need for debate and agreement about what universal oral healthcare is, and how this translates into the design of state-funded services, including who is best placed to deliver those services. Contemporaenous epidemiological data will be needed to inform evidence based decision making. This debate will be informed by conversations already underway at a global level, buoyed by the WHO Global Oral Health Action Plan, and in the wake of the COVID-19 pandemic when the importance of oral health as an essential aspsect of health came to the forefront (Benzian et al., 2022). Crucially, engagement with and open dialogue between stakeholders, including policymakers, health system actors, the dental profession and service users, with the aim of finding and aligning common, realistic goals should be viewed as a priority. Inviting GDPs to have a seat at the discussion table, and affording opportunities for their views to be heard will be key in this endeavour. Conversely, transparent communication regarding policy direction and intent, including the challenges of planning and resourcing services has the potential to develop relationships that are built on mutual understanding and trust.

The role and value of meaningfulengagement with dentists in informing the direction of oral health policy, systems design and contract reform has been demonstrated (Chazin, 2015; Jones et al., 2024). Following the publication of the UK Houses of Commons Health Committee Report on dental services (2008), work began in 2010 on the Dental Contract Reform (DCR) programme which saw new NHS contracts being piloted across England. Under these prototype arrangements, GDPs were remunerated via a blend of capitation and activity-based payments with increased incentives for prevention and the promotion of skill mix utilisation within teams (Department of Health and Social Care, 2023). In contrast to changes implemented in 2006, the DCR programme sought the design of new contracts with GDP support and engagement (NHS Business Services Authority, 2023). New arrangements garnered mixed reactions and support from GDPs, with some citing difficulties in achieving targets and changing patient behaviour (Rooney, 2018). The DCR programme in England ceased in 2022 as it was deemed not to have met its objectives, including increasing patient access (Addison, 2021).

4.6.3.2 Optimal investment, fostering autonomy and job satisfaction

Central to any debate around how services are designed and delivered will be how funding and resources are allocated, ensuring value for tax payers' money, while facilitating optimal population oral health outcomes and fair reimbursement for services provided. Funding envelopes remain constrained globally, therefore in tandem with discussions on UHC for oral health, there is a need for increased investment in services where feasible. Notwithstanding the challenges associated with funding and resource allocation, a key focus in any service design or operation should be the creation of working environments which promote GDPs' (and wider team members') sense of professionalism, altruism, clinical and entreprenurial autonomy, and which facilitate the practice of high quality, contemporary care, where prevention is at the forefront and appropriately rewarded (Witton et al., 2021). A move away from contracts where outputs and outcomes are measured in individual items of dental treatment to those which focus on holistic care and quality outcomes could be explored. This is of particular importance at a time when the oral healthcare market is diversifying, the demand for lucrative 'non-routine' care, including cosmetic dentistry and facial aesthetics is growing, and early career dentists face substantial debts to repay (Omran & Dowie, 2023; Patel, 2021). Dentists have greater choice than ever in terms of how they chose to utilise their skills, therefore the challenge for policymakers and health systems managers will be how best to accommodate and increase the appeal of routine primary oral healthcare in this changing landscape.

4.6.3.3 Flexibility and career development

At local and regional levels, affording health service managers greater flexibility in how resources are allocated and services are operationalised to best suit population needs while also taking into account the skills and views of GDPs and their teams, has the potential to further nuture a culture of shared decision making and trust, and engender a greater sense of professional value among practitioners. Where opportunities for skills development and career progression can be encorporated into contractual frameworks, these should also be explored. Evidence suggests that early career dentists in particular, value variety and posts which facilitate further skills development and career escalation (Health Education England (HEE), 2021; Thomson et al., 2021). Across England, a number of 'flexible' commissioning exemplars see block or previously unspent NHS contract funding allocated to GDPs to provide bespoke care packages tailored to local need (Hearnshaw, 2022; Sandom et al., 2022). In Greater Manchester where health planning and spending is devolved locally, a scheme to increase access to care for paediatric dental patients has proved popular with GDPs who receive additional NHS funding as well as training and support from specialists as part of this initiative (Holland, 2023; Nic Iomhair et al., 2022). Similarly, the development of a level-2 (enhanced skills) complexity training programme in paediatric dentistry has garnered significant interest among GDPs in the Yorkshire and Humber region. Under this programme GDPs receive additional hands-on, accredited training by consultants in paediatric dentistry following which they can receive a sessional rate of pay to deliver enhanced NHS paediatric care in their own practices (British Dental Association, 2020; NHS England WTE Yorkshire and Humber, 2024).

4.7 Conclusion

This realist review of GDPs participation in publicly funded, contracted primary oral healthcare services identified several important health systems contexts. These include emphasis on treatment rather than prevention, low priority for oral healthcare, funding and resourcing constraints, high external oversight and managerialism, and change implementation or contract operation with minimal frontline clinician consensus. At operational level, contracts can restrict GDP decision-making and ability to deliver high quality, contemporary and holistic patient care. Key underlying mechanisms were feelings of ceded clinical and entrepreneurial control, mistrust of those governing health services, feeling undervalued, stress and low morale, leading to demotivation and disengagement with the system. These contextual factors, drawn from a robust evidence base, are a good place to start to leverage health system change including improved GDP engagement, and increase participation in publicly funded systems, which ultimately is a component of providing universal access to quality primary oral healthcare for patients.

4.8 Chapter summary

This chapter is based on a realist review which was published in January 2025 in Health Policy (Leavy, Symmons, et al., 2025). As per TCD's guidance on PhD and Publication, the published article is presented above with additional supporting data provided in the Appendices. In this chapter I have described the methods, analysis and results of the realist review which produced six consolidated CMOCs and one final programme theory to explain causation. The findings above provide a theory-driven and evidence-based explanation of how and why health system factors influence private GDPs' decisions to participate in publicly funded, contracted oral healthcare services. The realist review sets the stage for the next and final study of this PhD – a realist interview study which utilises primary data captured through interviews to expand on a subset of findings from the realist review and situate them in the Irish oral healthcare system.

Chapter 5 Study 3: Realist interview study of private GDPs' participation in state-funded, contracted primary oral healthcare for low-income populations in Ireland

Manuscript submitted for journal peer review:

'Us and them': a realist interview study exploring how and why health system factors influence dentists' participation in state funded, contracted primary dental care for low-income populations in Ireland *(in peer review)*

Paul Leavy[1], Blánaid Daly[2], John Ford[3] and Sara Burke[1]

Author affiliations:

1. Centre for Health Policy and Management, Trinity College Dublin, Dublin 2, Ireland

2. School of Dental Science, Trinity College Dublin, Dublin 2, Ireland

3. Wolfson Institute for Population Health, Queen Mary University of London, UK

5.1 Chapter outline

This chapter will explore the third and final study in this thesis, a realist interview study which takes four of the six CMOCs developed in the realist review discussed above in chapter four as a starting point. Utilising these four CMOCs as the initial programme theory, the realist interview study produces more in-depth explanations for a subset of findings from the review. The approach utilised in this study have been outlined in chapter two and share many similarities with realist evaluations. Guided by the initial programme theory based on the four CMOCs from study two, primary data were collected via qualitative realist interviews of frontline GDPs, HSE dental services managers, civil servant and oral health services and policy academic subject experts. Data were coded using both inductive, deductive and retroductive coding and relevant text assigned labels of 'context', 'mechanism' or 'outcome'. Using realist logic of analysis, explanatory CMOCs were constructed iteratively resulting in a total of 13 CMOCs. These were subsequently merged into five consolidated CMOCs situated in the Irish context before finally being combined into an overarching programme theory.

In line with chapters three and four, this chapter is presented as per the article manuscript which I have written alongside my PhD supervisors and submitted for journal peer review. Additional interview data which informed the CMOCs are presented in the Appendices alongside the internal study protocol, ethics application and approval email and coding data.

5.2 Abstract

Objectives

To identify and explain the health system factors influencing private general dental practitioners (GDPs) engagement in state-funded, contracted primary oral healthcare for low-income adults in Ireland, in which circumstances, for which groups, how and why.

Methods

Nineteen realist interviews were conducted with frontline GDPs, health system actors and academic subject experts from Ireland and elsewhere. Collected data were then transcribed, coded, and analysed to generate context–mechanism–outcome configurations (CMOCs) and develop an overarching realist programme theory to explain causation.

Results

Thirteen individual and abstracted CMOCs were crafted and subsequently consolidated into five high level CMOCs. GDPs' engagement with state funded care is influenced by a myriad of complex health system contextual factors. These include low political and resource commitment to oral health; cost containment measures characterised by limited and outdated baskets of care and low remuneration; overtly bureaucratic oversight or contract administrative processes; adversarial communications and the absence of consultative mechanisms between the health system and GDPs. Other factors such as oral healthcare 'market' dynamics, GDPs' professional networks and community ties can also influence engagement in state care.

Conclusion

As Ireland looks to reform its primary oral healthcare system to widen population access to care and meet national oral health policy and WHO commitments on oral health, the findings of this study provide health system leaders with evidence to leverage system change and increase or sustain GDPs' engagement in state care. Leveraging such change has the potential to improve access to care for vulnerable populations and reduce oral health inequalities.

Keywords Dentist, Oral health, Primary care, Workforce, Policy, Ireland

5.3 Background

The World Health Organization (WHO) 74th World Health Assembly (WHA) marked a watershed moment in oral health globally. Recognising the public health burden of oral diseases which, despite being largely preventable, affect almost 3.5 billion globally (now almost 3.7 billion), the assembly adopted resolution WHA74.5 which called on UN member states to embed oral health within non-communicable diseases (NCD) and universal health coverage (UHC) agendas (World Health Organization, 2021). This historic resolution led to the development of the WHO Global strategy on oral health (2022)(World Health Organization, 2022c) and Global oral health action plan (GOHAP) in 2024 (World Health Organization, 2024). The GOHAP emphasises the need for health systems to adopt a public health approach to tackling oral health inequities that integrates oral health into primary healthcare. Outlined within the GOHAP are a series of action points to assist member states in achieving UHC for oral health by 2030. Regarding workforce, which is one of the six 'building blocks' of health systems (World Health Organization, 2010a), member states are encouraged to increase and strengthen workforce capacity to deliver essential packages of oral healthcare and ensure this capacity is sustainable and aligned with current and future population needs. In November 2024, member states adopted the Bangkok declaration: "No Health Without Oral Health" at the first global oral health meeting, reaffirming their commitment to the GOHAP and emphasising the need to strengthen health systems through primary care approaches (World Health Organization, 2025a).

5.3.1 Oral healthcare in Ireland and policy landscape

As one of the adoptees of the Bangkok declaration, Ireland is in the early stages of implementing *Smile agus Sláinte ('Smile and Health')* - National Oral Health Policy (NOHP) which was published in 2019, preceding the WHA resolution (Department of Health, 2019). The primary goals of *Smile agus Sláinte* are to *"provide the supports to enable every individual to achieve their personal best oral health"* and *"reduce oral health inequalities across the population by enabling vulnerable groups to access oral healthcare and improve their oral health"*. The Republic of Ireland ('Ireland') is an island nation and European Union (EU) member state located on the north western edge of Europe and has an estimated population of 5.3 million (2024) (Central Statistics Office, 2024d). Oral healthcare in Ireland is primarily delivered by private primary care providers and funded privately through out-of-pocket payments (Smith et al., 2022). There are however three publicly funded primary oral healthcare services currently available, each targeting different populations. The Oral Healthcare Service (OHS), formerly the 'Public Dental Service' (PDS) is operated directly by Ireland's publicly funded health service provider, the Health Service Executive (HSE) and serves children under 16 and adults with additional needs. The service is delivered by salaried dental

teams and aside from urgent care, is ordinarily targeted at children aged 7-8 and 11-12, however coverage and access are limited owing to resource and capacity constraints nationally (McAuliffe et al., 2022). State funded primary dental care for adults (>16) is largely delivered through contracting arrangements with independent, mainly self-employed private general dental practitioners (GDPs). The HSE's Dental Treatment Services Scheme (DTSS) principally serves low income, means tested adults holding a medical card (approximately 25% of the population) and offers a limited basket of care annually (Table 5) (McAuliffe et al., 2022). The Dental Treatment Benefit Scheme (DTBS) offers a free annual examination and part-subsidised cleaning to adults who have paid sufficient social insurance contributions on their income (McAuliffe et al., 2022). The scheme is administered by the Irish Government's Department of Social Protection (DSP). Both contracted schemes remunerate GDPs on a fee for service (FFS) basis. The current oral healthcare system was informed by the 1994 Dental Health Action Plan (DHAP) (Department of Health, 1994a).

Table 5: Overview of state funded primary oral healthcare services in Ireland

Service	Workforce	Target population	Care available
HSE Oral Healthcare Service (OHS) ***Formerly HSE Public Dental Service (PDS)***	State employed (salaried) dentists and auxiliaries (e.g., dental nurses, hygienists)	Children (<16) (approximately 22% of population) and some special care patients	Urgent dental care; single course of comprehensive care targeted at children aged 7-8 and 11-12 respectively (school screening service). Free at the point of use
HSE Dental Treatment Services Scheme (DTSS)	Independent, private GDP-contractors remunerated by fee for service (FFS)	Means tested adult medical card holders (>16) (approximately 25% of population)	Annual oral examination, cleaning, two fillings, extractions, urgent dental care. Additional fillings, cleanings, root canal therapy (front teeth only) & dentures require prior approval from local HSE dental service management (for high-risk patients). Free at the point of use.
Department of Social Protection (DSP) Dental Treatment Benefit Scheme (DTBS)	Independent, private GDP-contractors remunerated by fee for service (FFS)	Adults (>16) who have paid 3 years' (Pay Related) Social Insurance (PRSI) on their income and their adult dependents	Annual oral examination (no patient charge) & cleaning (patient co-payment of €15).

		(approximately 45% of population)	

Recognising the fragmented nature of services and substantial gaps in population coverage, namely among young children and vulnerable adults, *Smile agus Sláinte* proposes reform of state funded primary oral healthcare services in Ireland with greater provision of care by private GDP-contractors (Department of Health, 2019). The policy aims to contract routine state-funded care for all children (<16) and vulnerable groups to private GDPs in addition to existing adult populations currently served. A reoriented OHS will deliver episodic care for vulnerable patients on referral from local GDPs. *Smile agus Sláinte* highlights the need for increased access to routine primary oral healthcare for children under six, establishing 'dental homes' in general dental practice where prevention is embedded from early childhood. It also proposes to change how GDPs are remunerated, from FFS to bundled care or blended payments.

5.3.2 Study rationale

To achieve UHC for oral health, the GOHAP asks member states to *"explore how to optimize private oral health care providers' engagement…. through appropriate contracting and/or reimbursement schemes"*. However, while models of contracting state-funded dental care are long established globally and regarded as an efficient means of creating capacity within health systems, they are voluntary and therefore reliant on private providers opting-in to such contractual arrangements (Hellowell, 2020). Recent years have witnessed a decline in the number of private GDPs participating in the HSE DTSS for low-income adults in Ireland (Leavy, Fleming, et al., 2025). Since 2016, the number of live GDP contracts on the scheme has declined from just over 1,600 in 2016 to just over 800 in 2023, while the number of GDPs submitting claims, and therefore clinically active on the scheme fell from 1,300 in 2016 to just over 800 in 2022 (Leavy, Fleming, et al., 2025). Both the DTSS and DTBS were subject to substantial government budgetary cuts in 2010 following the global financial crisis (McAuliffe et al., 2022). The number and volume of available treatments on both schemes were reduced and fees remained unchanged on the DTSS until 2022 (Flanagan, 2022). The decline in participation has garnered significant political attention owing to access difficulties for patients and widening oral health inequities (Houses of the Oireachtas, 2024b). From a health policy implementation perspective, it also presents a significant workforce planning challenge in engaging GDPs in any new or revised schemes and creating system capacity to deliver services as proposed in *Smile agus Sláinte*.

Challenges surrounding GDP participation in state funded dental services are not unique to Ireland or dentistry. Workforce recruitment and retention challenges in healthcare are often symptomatic

of wider health system dysfunction and represent a complex area of inquiry owing to the open nature of health systems with a myriad of interacting components influencing the behaviour of the system to produce both intended and unintended outcomes (Leavy, Symmons, et al., 2025). Understanding what these components are and how and why they influence the behaviour of the health system and its constituent parts, for example, the workforce can provide policymakers and system leaders with insights and evidence for developing mitigating strategies to leverage system change and increase workforce engagement.

There is a sizeable body of international research examining GDP participation in publicly funded dental services. In our earlier realist review, we developed a range of theories relating to how and why health system factors influence private GDPs participation in state funded contracted care (Leavy, Symmons, et al., 2025). Key systems' contexts identified included low political and health system priority for oral healthcare, funding constraints, and change implementation with minimal professional consensus. Where contracts limit GDP decision-making and perceived ability to deliver high quality care this can lead to feelings of lost control, stress, low morale, mistrust of the system and feeling undervalued. Qualitative data which informed our theories primarily came from the UK literature however findings were often reported from the perspectives of GDPs unhappy with contract terms, with health system perspectives largely absent from the data. Furthermore, despite the aforementioned workforce and access challenges, we found an absence of primary, qualitative research examining this topic in the Irish context.

In light of extant challenges in contracted dental care and the absence of primary research in this area, in this study, we collected qualitative data to further test and build upon some of the theories from our realist review in the Irish context and gain a deeper understanding of the current workforce challenges in contracted dental care in Ireland – namely the DTSS for low income adult populations.

5.4 Aim

The aim of this study is to understand what are the health system factors influencing private GDPs engagement in state-funded, contracted primary oral healthcare for low-income adults in Ireland, in which circumstances, for which groups, how and why.

5.5 Methods

5.5.1 Rationale

For this study, we conducted semi structured, qualitative realist interviews in accordance with an internal team protocol (Appendix 13). Ethical approval was granted by the Trinity College Dublin Centre for Health Policy and Management/Centre for Global Health Research Ethics Committee on 30/10/2024 (REAMS No: 1926) (Appendix 12). Throughout, careful attention was paid to ethical aspects of this study including obtaining informed consent and maintaining confidentiality and participant anonymity.

As with other realist methodologies, this theory-driven approach involves generating, testing and refining theories of how phenomena (or 'programmes') work. Specifically, they seek to uncover underlying (hidden) mechanisms ('M') which are triggered or modified in specific contexts ('C') to produce given outcomes ('O') of interest (Pawson & Tilley, 1997). The interplay or causal relationship between these (i.e., C + M = O) are represented by Context-Mechanism-Outcome Configurations (CMOCs) which form the building blocks of realist methodologies (Duddy & Wong, 2023). This realist logic of analysis is particularly suited for investigating causation in phenomena operating within complex systems, such as health systems (Wong, 2018c).

This study was informed by an initial programme theory developed from our realist review (Leavy, Symmons, et al., 2025). Specifically, we utilised four CMOCs (CMOCs 1, 3, 4 and 6) from the review (Figure 17) as the initial focus and starting point for this study (Leavy, Symmons, et al., 2025). We selected these CMOCs as we felt they had most transferability and relevance to the Irish oral healthcare system based on the structure and governance of contracts and the research team's prior knowledge of the Irish oral health system. These CMOCs, which had strong evidence base in the existing literature, informed our interview schedule which was developed using realist interview language and followed the RAMESES II Project guidance on realist interviews (The RAMESES II Project, 2017; Westhorp & Manzano, 2017). For this study, we wanted to focus on high level health system factors which influence private GDPs' engagement in HSE-contracted care for low income adults in Ireland (i.e., the Dental Treatment Services Scheme, DTSS) therefore we utilised the WHO health systems building blocks as our framework (World Health Organization, 2010a). This framework comprises six key elements, namely service delivery; workforce; information; medical products, vaccines and technologies, financing and leadership/governance. Additionally, 'people' (or communities) are sometimes considered the 'seventh' block and one which we considered important in the Irish context as populations expressing a demand for care (Sacks et al., 2019).

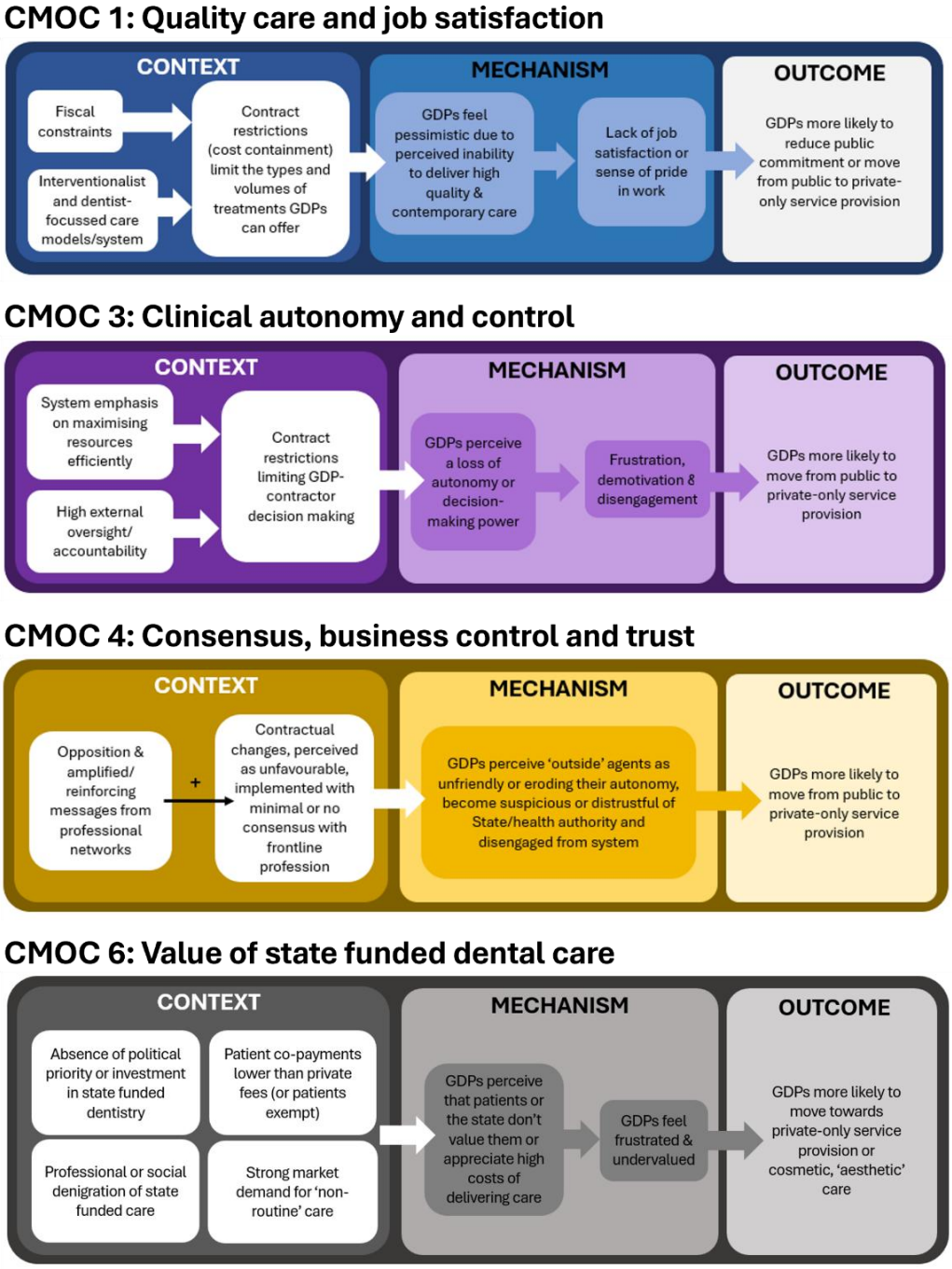


Figure 17: Initial programme theory: CMOCs 1,3,4 and 6 from realist review of the international literature

5.5.2 Participant recruitment

A total of 19 interviewees were recruited for this study via purposive and snowball sampling. Purposive sampling, sometimes called 'judgement sampling' is a recruitment tool, widely adopted in ethnographic and qualitative research where individuals are selected for interview based on their extensive knowledge or experience in the field of inquiry (Bernard, 2006). Health system actors

and academic subject experts were identified by members of the research team who have broad networks in oral healthcare in Ireland and via interviewee recommendations and contacted directly via email. A 'call for participation' campaign targeting GDPs was circulated on social media and shared through the PI's professional networks. Prior to recruitment, a sampling frame was developed with participants being recruited based on their significant experience working in or having in-depth knowledge of the primary oral healthcare system in Ireland and their ability to contribute to, refine or consolidate programme theory. As subject diversity is key to informing the development of rounded programme theory, participants from a range of clinical and non-clinical backgrounds were recruited including general dental practice (i.e., practice principals and associates, current and former contractors, urban and rural practising), health service dental governance and management (e.g., contract management, administration, payments), health policymaking and implementation (civil service and HSE), and subject area expertise including dental educators (Table 6). Of the six frontline GDPs recruited, three were current DTSS contract holders, two were former DTSS contractors and one had never held a DTSS contract. GDPs practised across urban, satellite commuter, rural and remote coastal areas.

Table 6: Interviewees for realist interview study

Participant	Number
Frontline GDP practising in Ireland	6
Health service manager or other official	6
Civil servant	1
Academic subject expert – Ireland	3
Academic subject expert – international	3
Total	**19**

5.5.3 Data collection

Prior to use, a draft interview schedule was piloted among a small convenience sample (n = 3) of non-dental researchers known to the principal investigator (PI). These were informal, and data captured were not utilised in the analysis. The purpose of piloting was to gauge interviewees' understanding and comprehension of questions. Following informed consent, semi structured, one to one interviews with all 19 participants were conducted between 15th November 2024 and 7th February 2025. The majority of interviews (n=17) were conducted online via videoconferencing platforms or by telephone while two were conducted in person. All 19 participants were interviewed once, providing enough data to achieve theoretical sufficiency Two interviewees were later contacted by email and asked to provide additional contextual information relating to information provided in their interviews. Interview duration ranged from 25 to 103 minutes (median

= 60 minutes). We utilised a flexible realist interview schedule to guide interviews (Appendix 14) which was informed by the RAMESES II realist interview guidelines and Manzano et al (2016) (Manzano, 2016; The RAMESES II Project, 2017). Interviews were conducted by the lead author (PL) using a realist technique known as the 'teacher-learner' cycle (Pawson, 1996). In interviews, participants were asked a combination of open-ended questions (to enlighten possible new CMOCs) and presented with theories based on selected CMOCs from the earlier realist review. Interviewees were asked to reflect on whether CMOC theories fitted with their own perceptions and experiences in the Irish setting (and in what ways) and to modify or refine these them accordingly. The 'teacher-learner' cycle entails the researcher first teaching the interviewee about their theories, with the interviewee then teaching the researcher about their perceptions and experiences (Pawson, 1996). This process helps the researcher to explore how different mechanisms and contexts may result in both intended and unintended outcomes and refine theories. This approach differs to standard qualitative interviews where the interviewer ordinarily puts aside their own preconceptions or assumptions. By their very logic, in realist interviews the interviewer brings their own theories, which has an influence on the types of questions and how they are asked. Similarly, the interviewee will have their own ideas about what the interviewer is interested in, which influences the answers they provide. In theory-driven realist research, the interview is used as a means for empowering participants to revise and expand putative theories. Interviews were recorded and transcribed verbatim using a college approved, encrypted and password protected laptop.

5.5.4 Coding and analysis

Preliminary analysis of interview data took place while interviews were ongoing. This allowed for the updating of the interview schedule and for revised theories to be presented to subsequent interviewees. Interview transcripts were imported and coded in the style described by Papoutsi et al. (2018) using NVivo 12 Plus qualitative analysis software (QSR International, Warrington, UK) (Papoutsi et al., 2018). Codes, which were based on what interviewees described, were developed initially using a narrow deductive coding framework from the realist review findings and interview schedules (e.g., 'funding', 'quality care') but was primarily inductive and retroductive in nature, based on concepts emerging from the interview data. Codes were then grouped conceptually by similarity and mapped against the WHO building blocks to understand what issues were emerging from the data and create health systems-focussed categorisations. Coding and categorisation were conducted by the lead author (PL) with a senior supervising co-author (SB) reviewing these independently. These were subsequently discussed with, and sense checked by remaining members of the research team.

The categorised data were then analysed using realist logic by applying labels of 'context', 'mechanism' or 'outcome' to relevant sections of text. By adopting a realist analytical approach, we were able to identify (a) outcomes related to general dental practitioners' engagement in state funded contracted dental care for low income groups in Ireland, (b) the circumstances in which these outcomes were likely to occur, from a health systems perspective (contexts) and (c) why these outcomes occurred (mechanisms). Over a period of four months, CMO configurations were constructed iteratively by PL and senior supervising author JF, with input from SB and BD. These were then utilised to inform our overarching programme theory.

5.5.5 Project Advisory Group

In line with other realist methodologies, a project advisory group (PAG) workshop was convened to consider emerging findings of this study (Power et al., 2024). Workshop attendees included two members of the immediate research team (PL and SB), oral health services, workforce and policy researchers (n=2), population health/health systems researcher (n=1), frontline GDP with union experience (n=1), civil servant working within the Department of Health (Ireland) Oral Health Unit (n=1) and patient/public representative (n=1). An online workshop was held in June 2025 during which emerging theories were presented to stakeholders. PAG members were given the opportunity to confirm, refine, or refute these, based on their prior knowledge and experience.

5.6 Results

Utilising data from interviews, we crafted 13 individual CMOCs, outlined in Table 7 below. These are presented as 'middle range theories' which means they are presented at a level of abstraction that is specific enough to clearly explain the phenomenon, but they are close enough to observed data to be incorporated in propositions that permit empirical testing (Greenhalgh T, 2017). Thereafter we present five consolidated CMOCs providing detailed narratives of the CMOCs in action in the Irish context.

5.6.1 Abstracted Context-mechanism-outcomes configurations

Table 7: Realist interview study individual context-mechanism-outcome configurations and illustrative data

CMO configuration	Illustrative quotes
CMOC 1: Political and resource commitment to oral health and system fragmentation	
CMOC 1 When oral health holds limited political capital with broader financial constraints, and politicians perceive GDPs as financially privileged or opportunistic **(C)**, health system leaders or managers deprioritise oral health within broader health service planning triggering feelings of irrelevance, lack of integration across health services and lack of support (e.g., clinical and non-clinical supports) **(M)**. This leads to a mismatch between the articulated need from GDPs and service provision **(O/C)** and in turn, this results in loss of trust in the public system and disengagement with strategic reform **(M)** leading to contract resignations in favour of wholly private practice **(O)**.	*"there was [sic] a lot of resignations during COVID… the profession felt that they weren't being supported by the state during COVID, like the minister promised, you may remember, promised dentists PPE and they never got it you know. So there was a lot of trust lost" – Interviewee 1* *"There's no like, I haven't had a single support on that. I haven't found support on how to deal with complex patients. If I'm not able to treat them in practice, where do I refer them? Like, I would have some patients coming in, and they'd be disabled, you know, physically disabled or mentally impaired, and I wouldn't know where to refer them, except to the dental hospital, just because I was [a student] in the dental hospital, but you don't have that specific guidance on what to do with these kind of patients, support, talking to someone - no, the support isn't there really. It's kind of… they give you the booklets, they give you the prescription pads, they tell you need to send for approval….and, you know….. good luck…" – Interviewee 13*
CMOC 2: Financing and oral health market dynamics	
CMOC 2.1 When political pressures constrain funding causing limits to remuneration amidst rising operational costs **(C)**, GDP contractors perceive the current model as unsustainable and feel undervalued by the state **(M)**, leading to disengagement from public schemes and movement towards private-only care **(O)**. ***CMOC 2.2***	*"There is absolutely no funding at all for any part of it, and you carry all of the costs and all of the risks. And you know, if, if you have a practice with quite a, you know, a big base of medical card patients, you're carrying a big risk, then when the scheme is changed without consultation, you know you're carrying the brunt of that cost anyway, and then you still have to pay the cost, whether or not you're getting sufficient payment for the treatments that you're carrying out. So it's basically a cost benefit analysis. Can you cover your costs? And can you pay your staff? That's a big thing. And can you make a living yourself that you could raise a*

When there are strong markets for private and aesthetic treatments, combined with professional and societal importance and emphasis on cosmetic treatments and the absence of state system mentorship **(C)**, GDPs perceive private practice as more lucrative and less demanding compared to public schemes **(M)**, particularly among early-career GDPs. This prompts non-engagement or disengagement from public schemes in favour of private practice **(O)**. ***CMOC 2.3*** In socioeconomically disadvantaged or rural areas with weaker private markets and when GDPs have strong community ties **(C)**, GDPs feel a moral obligation to provide public care and are more accepting of income and scheme limitations **(M)** leading to increased willingness to remain in public care, adapting their public commitment in order to maintain a capacity for supplementary private work using strategies such as limiting public patient intake or geographical ring-fencing **(O)**.	*family on? And that's you know, anyone who runs a business, you have to, you have to cover your costs. Otherwise, you know, there's no point."- Interviewee 19* *"I think the graduate coming out now, there's no real effective mentorship that I can see like. They're coming into corporate practice and the dollar rules. They've little or no mentorship within practices and it's all associate-driven like and it's money, money, money"- Interviewee 17* *"I would have left the scheme if I could, but I can't, because of my location, you know (laughs). But, you know, I think ..what I'm finding later in life is.... you know, the most satisfying part of the job is giving everybody access, you know what I mean. Its....now look,....I can't leave the scheme, so I'm not Mother Theresa but I'm kinda, I'm trying to.....reflect....on.....you know....and it's the hard cases..they're coming down, they cant... I mean, it would be tragic if these people didn't have access locally.... to the scheme. And... you know.... it is.... it is satisfying, more satisfying than if you just did your private work...its just going, just going wow, can we operate the scheme... that worked very smoothly for that person...that's another happy customer." – Interviewee 16*
CMOC 3: Contract administration	
CMOC 3.1 When cost containment limits treatment options and increases the likelihood of difficult conversations between GDPs and patients **(C)**, GDPs become frustrated at the inability to provide comprehensive care and feel they are treating patients inequitably **(M)** leading some GDPs to remain in public care to advocate for, and serve those they can **(O)**. ***CMOC 3.2***	*"I certainly went into dentistry to try and A) do the right thing, and B) help people. And if, if you're hampered in your ability to do that, that's very difficult.... it's extremely challenging not to be able to give the patients the care that A) you want and B) they need. Very challenging. You know, particularly when patients can't afford it. That's one of the reasons I've continued with the medical card scheme." – Interviewee 19* *"the fact that they [DTSS contractors] cannot treat patients the same as they might and provide the same level of treatment, I mean, they're, you know, even*

When public services face financial constraints limiting treatment options, GDPs need to have difficult conversations with patients **(C)**. GDPs experience professional dissonance and frustration due to compromised clinical decision-making and difficult patient interactions regarding costs compounding low morale **(M)**. In turn this leads to GDPs being more likely to reduce or fully withdraw from participation in public schemes in favour of private practice **(O)**.	*down to the fact they're limited to a certain number of fillings, so people come in and, you know, you know yourself, they could have a mouth full of decay in that socio-economic group, and you're ending up picking the two fillings you can do, and then whatever happens after that is between the dentist and the patient. So it's a sense of utter frustration I think people have, and it's overcome any sense of altruism and or, you know, sort of moral obligation to treat those 'well less off' which I do believe exists in in the profession" – Interviewee 4*
CMOC 3.3 When prior approval processes lack clear guidance and standardisation **(C)**, there is variability in their interpretation and implementation **(M)** leading to restricted clinical decision making among GDPs **(O/C)**. In turn this leads to perceptions of micro-management, perceived mistrust and increases tension between GDPs and managers **(M)** which makes GDPs avoid the approval process and increases the likelihood of leaving the public system **(O)**.	*"I suppose I feel that I'm not being trusted to make adequate clinical decisions. If I feel that a patient, say, for example, and this happens very regularly, a tooth breaks, a portion of the tooth comes away, and you fill the tooth. Couple of years later, another portion comes away, and then you have to get approval to refill that tooth. The tooth needs filling! If you don't fill it at some point, it's going to need extracting. And the longer it's left, the greater the risk of that. And that is quite frustrating, because the simple solution will save a lot of trouble. But it's a question…. it feels like your clinical decisions are being questioned by somebody who hasn't seen a patient. And it also… I find… I feel like my honesty is being called into question. I really do……yeah, it's as simple as that" – Interviewee 19*
CMOC 3.4 When prior approval processes lack clear guidance and standardisation **(C)**, there is variability in their interpretation and implementation **(M)**, leading to GDPs having conversations which disappoint patients due to unsuccessful approval outcomes **(O/C)**. This increases GDPs feelings of guilt, discomfort, and perceived systemic unfairness **(M)**, makes GDPs avoid the approval process and increases the likelihood of leaving the public system **(O)**.	*"someone 'up there' is saying, 'no'… they're not approving, you know, and like, it leaves it in your hands to deliver that news to the patient. It's unfair, because you know the patient needs the treatment and they're not getting it, and it's unfair on the dentist to be like, 'oh I'm so sorry you weren't approved for the treatment, you have to pay X amount of money to get it on the private scheme'. You know, it's really annoying" – Interviewee 13*
CMOC 3.5	*"I am inclined to ensure that within what they are eligible to provide, that there is as little restriction or limitation or hindrance on our behalf put on those dentists*

When prior approval processes lack clear guidance and standardisation **(C)**, there is variability in their interpretation and implementation **(M)**. If approval is successful, validating GDPs clinical decisions **(O/C)**, GDPs feel supported with improved relationships with management and increased willingness to accept limitations of the scheme **(M)** leading to an increased likelihood of staying in schemes **(O)**.	*as possible. Because, you know, we are trying to keep the last man, you know, the last man standing, in effect. But you know, the HSE aren't stupid, the Principals know that we're at the mercy of the dentists. And so I would be very surprised if, if you looked nationally, although there may be variability, I think there will certainly be a lot of, kind of, really serious efforts made to try and keep this moving as quickly as possible, because otherwise it falls back on the HSE." – Interviewee 5*
CMOC 4: Quality assurance (probity)	
CMOC 4 In the absence of robust, standardised quality assurance mechanisms, combined with perceived accusatory or confrontational communications from health service management **(C)**, GDPs experience feelings of unfairness, mistreatment and defensiveness **(M)**. Such experiences reinforce conflicting relationships, prompting GDPs to disengage or withdraw entirely from public schemes, thereby exacerbating professional isolation and mistrust **(O)**.	*"Yeah I mean, they are certainly dictatorial. I mean, I had, many years ago, a dispute over the number of surgical [extractions] I was doing. I do take out multi rooted teeth, in general I section them- I have VarioSurg with saline irrigation. I take them out as sections, pretty much every multi-root [tooth]. And I have no issues, but you know that, they have all their metrics in [HSE] 'central', wherever it is. So that did trigger a bit of probity. I felt that it was way over the top." – Interviewee 16*
CMOC 5: Communication and engagement	
CMOC 5.1 When collective contract negotiations between the health system and GDP representative bodies become unilateral, rigid, and adversarial **(C)** this leads to entrenched positions and mutual suspicion, defensiveness and negative interpretations of communications **(M)** and subsequently reduces GDPs willingness to engage in state-funded care and health care managers less willing to openly engage or negotiate with GDPs **(O)**. ***CMOC 5.2***	*"I changed a referral letter - the content, there was a kind of a referral template for them to refer in oral surgery referrals. And somebody, anyway, one of the GDPs got upset about this and the next thing, there was this huge backlash! And I wasn't saying we weren't going to take all oral surgery referrals….I might have made some kind of reference to there needs to be, that the impacted wisdom teeth needed to be referred in as per the NICE guidelines. But anyway….the point was, the reaction I got was so negative that I thought, well you know what, I'm never meeting with these guys" – Interviewee 9*

In contexts lacking formal feedback and engagement mechanisms during health system changes without accurate consensus on the outcome **(C)**, GDPs feel ignored, isolated, and excluded from decision-making processes **(M)** leading to decreased engagement with health service management and state-funded care systems **(O)**. ***CMOC 5.3*** When GDPs have open communication channels and formal feedback mechanisms within the health system **(C)**, GDPs feel understood, supported, and valued by health system management **(M)** leading to more positive relationships, reciprocity, and increased sustained engagement by GDPs in public scheme **(O)**.	*"That [abolition of local monitoring committees] removed the local input, if you like, it became, then more of a kind of 'us and them' thing really, then you know, where you had the payments and the politicians and then and the policy makers sitting with the professional representative groups. And I think the people further down the chain felt more removed. They just didn't know what was going on. And you know, over time, there was a lot of lot of arguments and a lot of lot of misinformation that went out, but more and more people started leaving the scheme because they just couldn't, they just said, 'No, I don't want to be dealing with the HSE'."- Interviewee 3* *"I actually found the relationship, I could pick up the phone and have the chat [with the HSE dental manager], which was a big help - having a conversation, a direct conversation by phone helps enormously for everyone to know exactly where everybody else is up to. Yeah, I would be a great believer in picking up the phone and having a chat."- Interviewee 19*

C = context; **M** = mechanism; **O** = Outcome; **O/C** = outcome functioning as context; **GDP** = general dental practitioner; **HSE** = Health Service Executive; **DTSS** = Dental treatment Services Scheme

5.6.2 Consolidated Context-mechanism-outcomes configurations

5.6.2.1 Consolidated CMOC 1: Political and resource commitment to oral health and system fragmentation

CMOC 1 (Figure 18) describes the impact of a historical absence of, and low priority and commitment to primary oral healthcare in Ireland on the deprioritisation of services, health service delivery and system fragmentation. This exists within a broader context of dentistry yielding limited political capital and perceptions among dentists that oral health holds limited population importance, and system change inertia in Ireland. Furthermore, interviewees reported perceiving that individuals within positions of power, for example government ministers historically may have held negative views of GDPs as opportunistic, further contributing to low priority for oral health.

The deprioritisation of oral health in Ireland triggered in the context outlined above was notable in 2011 following the great recession when State schemes were scaled back, and fees were frozen as part of Irish Government austerity measures in the form of disproportionate oral health budgetary cuts. For GDPs holding these contracts, this led to a perception that they were irrelevant to the Government, and a sense of denigration (as well as shock, fear of financial hardship and uncertainty). This sense of irrelevance and degradation was also reported by GDPs in 2020 when government promises to provide personal protective equipment (PPE) to DTSS contractors (in the wake of COVID-19) did not materialise despite calls for this (and the introduction of other supports) from those within health service dental management. GDPs also reported feeling unsupported and a sense of abandonment and isolation within the health system, perceiving that the government did not recognise or understand their plight.

More broadly, interviewees perceived GDPs as being poorly integrated within the Irish general and oral healthcare public systems. A notable manifestation of this fragmentation is the absence of, or inconsistencies in availability of clinical and non-clinical supports for state-contracted GDPs, for example specialist referral pathways or scheme training and a perceived absence of collaborative working relationships between contracted GDPs and local community dental services. Some also suggested that the absence of contemporaneous data on population oral health needs and waiting times for treatment on the DTSS was contributing to a lack of political 'visibility' and salience on this issue.

These outcomes function as additional contexts triggering both individual and collective loss of trust in the 'state' and health system among GDPs (notably following the deprioritisation during the austerity and COVID-19 periods) and demotivation and disengagement with HSE-contracted care.

The absence of supports has triggered feelings of being unsupported by and isolated within the health system. Collectively these mechanisms have led GDPs to reduce their public commitment and have led some to leave the scheme altogether.

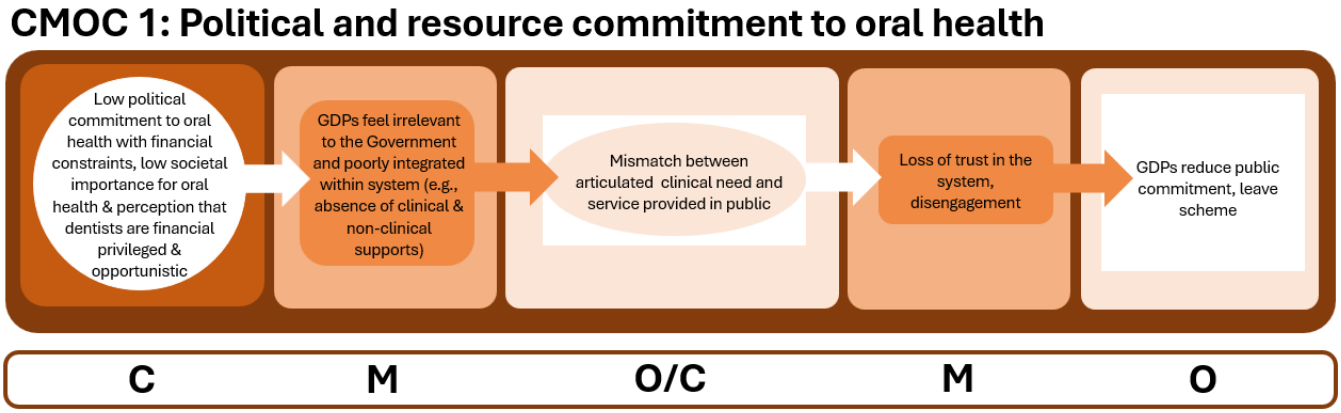


Figure 18: Consolidated CMOC 1: Political and resource commitment

5.6.2.2 Consolidated CMOC 2: Financing and oral health market dynamics

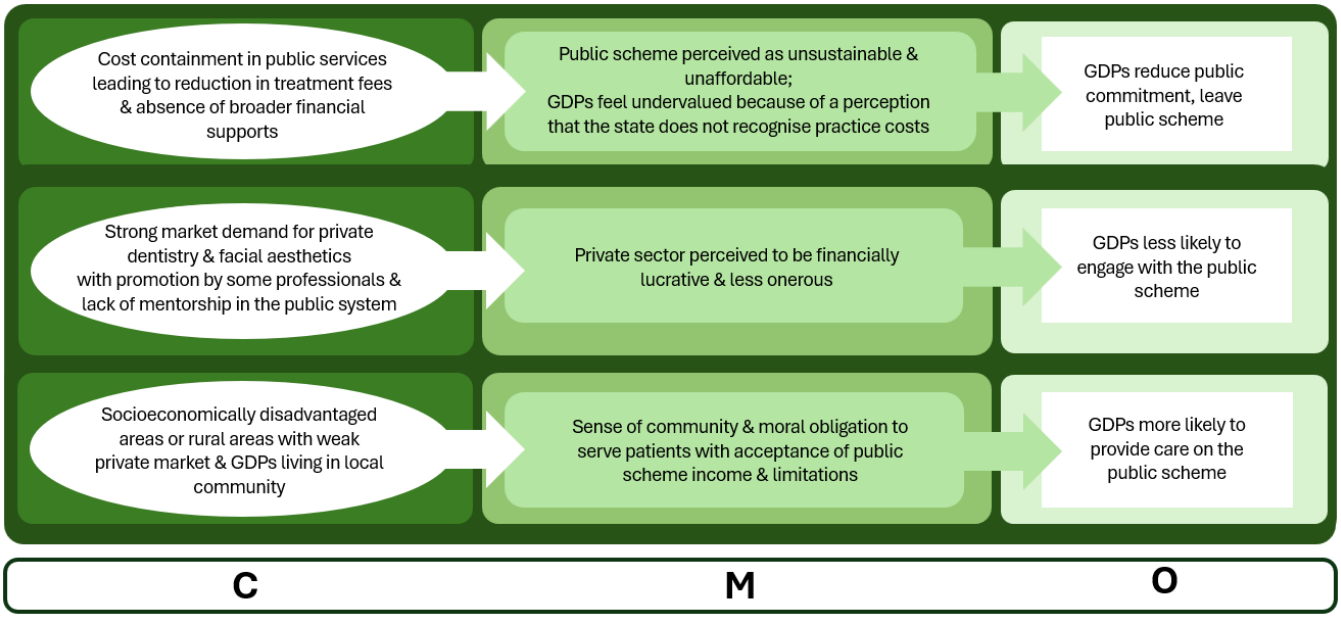
CMOC 2 (Figure 19) explains the role of health system financing and the wider dental care 'market' in Ireland on GDPs' engagement in HSE-contracted care. Building on some of the same contextual factors in CMOC 1 – austerity measures, cuts to state schemes, constrained fees and the absence of practice or additional financial supports (e.g., domiciliary care payments), interviewees reported that for some GDPs these factors, alongside inflation and rising practice costs, can trigger perceptions that the state or health system does not recognise the costs of delivering primary dental care and feelings of not being valued or rewarded appropriately for their efforts in providing state funded care. Where GDPs (primarily practice owners carrying business costs and risks) come under significant financial pressure, this can result in anxiety, and a sense of unsustainability and unaffordability in continuing on public schemes. Cumulatively, these factors can lead to GDP demotivation and disengagement with HSE-contracted care.

Concurrently, wider economic conditions and the private market play a significant role in influencing GDP participation in state contracted care – especially amongst urban and early career practitioners. Where there is a strong population demand for private dental care and medical (facial) aesthetics, this can trigger perceptions that this sector is financially more lucrative and less onerous compared to the DTSS whose patient cohort may be regarded as more complex and challenging to treat. Interviewees at both frontline and health systems level expressed views that a profit-focused, marketing culture in private dentistry had emerged in Ireland where the wider dental profession including industry, corporate bodies and professional representatives were highly influential in defining 'oral healthcare', promoting aesthetic treatments and independent practice (over state-funded care) and that this was buoyed by high societal interest and demand in cosmetic care. Some also perceived that there was an absence of state-supported system mentorship or a culture that engenders a sense of public service ethos and social accountability among dentists. The effect of the above on GDP behaviour is the non-engagement of GDPs, notably early career dentists in HSE-contracted care in the first instance, as well as the demotivation and disengagement among existing contractors.

Conversely, where there is a less buoyant market in private oral healthcare, for example during recessionary periods, in socio-economically disadvantaged areas or rural areas where a high proportion of the local population is eligible for publicly funded care, GDPs may be more likely to provide state funded care, because they perceive this to be an acceptable means of earning an income and therefore may be more willing to accept scheme shortcomings as a result. Similarly, when mid or late career GDPs' practices are located in rural areas and where GDPs reside in and have personal ties with their local communities, they may be less likely to leave the scheme,

because they feel a sense of community and a moral obligation to serve their patients. Some GDP interviewees in these areas reported that they had chosen to remain in the DTSS but adapted their public commitment in order to maintain some capacity for private work, for example by 'ring-fencing' their locality as a *de facto* 'catchment area' or closing their books to new DTSS patients.

CMOC 2: Financing and market dynamics



Some GDPs reported that they derived a sense of job satisfaction in providing care to vulnerable groups.

Figure 19: Consolidated CMOC 2: Financing and market dynamics

5.6.2.3 Consolidated CMOC 3: Contract administration

The third CMOC explores the impact of scheme administration and oversight —both at national and local levels in influencing relationships between GDP contractors and the health system, and engagement in care (Figure 20). As highlighted in CMOCs 1 and 2, cost containment measures introduced in 2010 limited the number of restorative and preventative treatments available to HSE-contracted GDPs. Notably, these contract changes allowed for 'unlimited' extractions without the need for prior approval. More broadly, interviewees expressed views that the current contract was outdated and lacked intent in terms of clearly defining desired population oral health outcomes. For some GDPs (especially those with a strong sense of social accountability), operating under these contract limitations can trigger feelings of frustration because of a perceived inability to offer a full complement of necessary care they want to on the scheme and perceptions of treating their patients inequitably. Notably for these GDPs, this has led some to remain in the scheme and to try and serve those they can including advocating for their patients to receive more care through prior approval.

Similarly, interviewees spoke of difficulties in clinical decision making, namely which teeth to restore and which to extract or leave actively diseased and of discomfort in having conversations with patients on alternative private treatments and costs. They reported feelings of frustration, professional dissonance and low morale at having to make difficult decisions which they perceived not to be in their patients' best interests and discomfort because their patients may not be able to afford private care. This can lead to some GDPs to reduce their public commitment or leave the scheme in favour of fully private care.

The process by which GDPs must apply to local HSE dental managers for approval to undertake additional treatments ('prior approval') and its governance was a factor frequently cited as having a major influence on relationships and GDP engagement with state care. From a scheme governance perspective, a view held among many interviewees working at health systems level was that there is a lack of clear guidance and standardisation of the prior approval process or accountability within health service management hierarchy. There were perceptions that local health service dental managers may have differing levels of interest, experience in or availability to manage approvals (due to other commitments) and that some may be overly dogmatic in their interpretation of contract rules, for example defining patient vulnerabilities. These factors trigger differing approval approaches and outcomes nationally and interviewees opined that greater standardisation and calibration or consensus among managers was required, for example on 'borderline' approval cases.

GDPs widely reported feeling frustrated at having to apply for prior approval in the first instance because of a perceived a loss of clinical decision-making power and a sense of being 'micro-managed' by health system managers. The prior approval process (and other aspects of the scheme, for example seeking payment) was widely regarded has having a high degree of administrative burden on both GDPs and health service managers, heightening frustration. When prior approval requests are rejected by dental managers, this triggers (or reinforces) perceptions of lost control and micromanagement. Some also reported feeling like their professionalism and honesty were being questioned and that they were not being trusted to make appropriate clinical decisions.

Amid an absence of GDP scheme induction or training and publicly available information on, and perceived 'grey areas' surrounding scheme entitlements and eligibility, GDPs are often tasked with '*breaking the bad news'* on prior approval rejections to frustrated patients. Interviewees reported this triggered perceptions of system unfairness among contractors, guilt and further frustration and discomfort in having to provide (often time consuming) explanations of system limitations and discussions on out-of-pocket alternative costs.

The resulting outcomes of these scenarios are strained relationships between practitioners and health system managers, GDPs becoming demotivated and disengaged or as some suggested, GDPs persisting on the scheme but limiting their engagement to provision of 'above the line' treatments without approval only and ultimately limiting their engagement with health system management.

Conversely when prior approval requests are readily approved by health system managers who may exercise a high degree of local flexibility in their interpretation of contract rules (in an effort to keep GDPs in the scheme), this can reduce GDP frustration and engender a sense of being supported, control and ability to accept scheme shortcomings. Many felt that this did and had the potential to improve working relations between GDPs and local management and keep GDPs engaged in the state sponsored care.

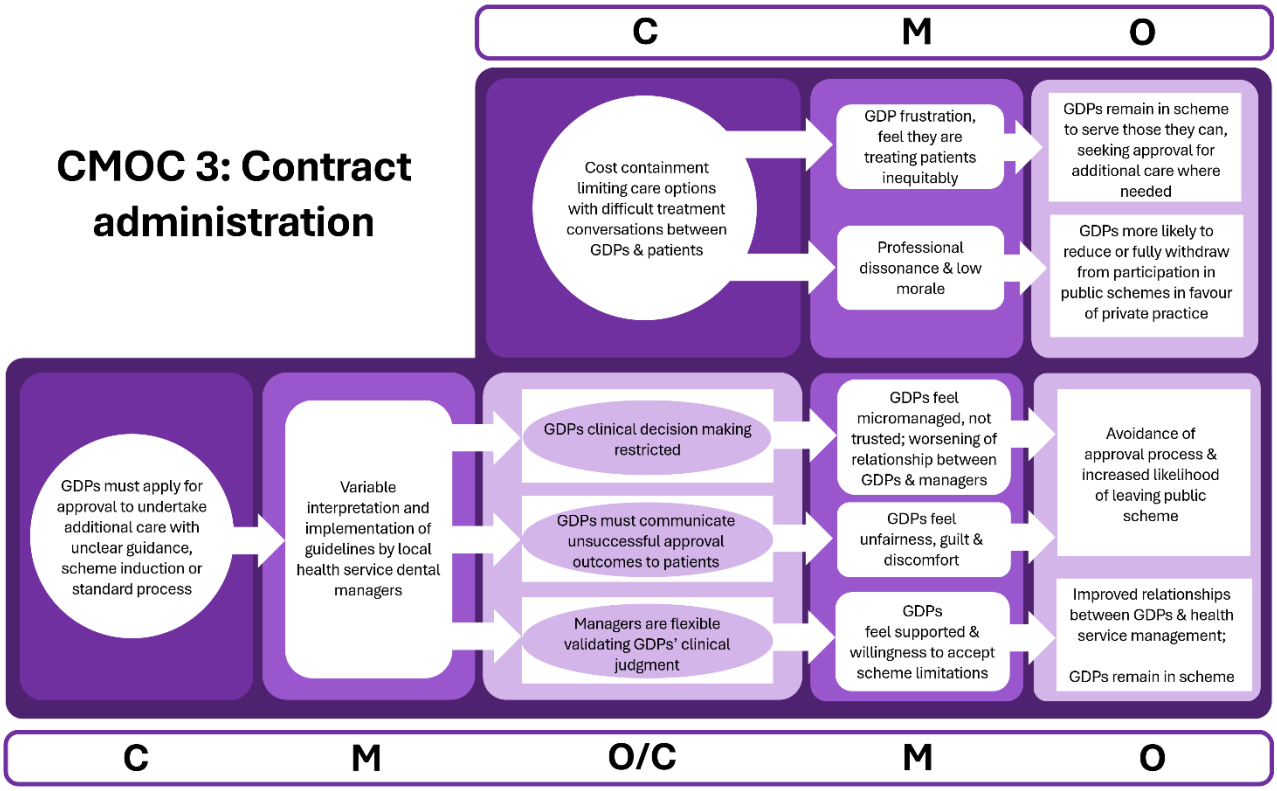


Figure 20: Consolidated CMOC 3: Contract administration

5.6.2.4 Consolidated CMOC 4: Quality assurance (probity)

CMOC 4 examines quality assurance, referred to as 'probity' in the Irish health system (Figure 21). Like prior approvals, contexts and mechanisms relating to probity emerged as those frequently considered key in informing relationships and GDP attitudes towards, and participation in state funded care.

Contextually, many expressed the view that GDPs in Ireland are underexamined with insufficient checks in place to ensure GDPs are adhering to contract rules, namely claiming appropriately, and that there were insufficient clear clinical standards guiding GDPs or health system managers. There was a view that historically, some GDPs had engaged in opportunistic behaviour and that this may have contributed to spiralling scheme costs (prior to austerity cuts) and a dim political view of GDPs among some in power. Many interviewees also suggested that there was a background culture of opportunistic and evasive behaviour (*'ducking and diving'*) in Ireland and an absence of a culture of continuous improvement or system oversight among GDPs.

Interviewees frequently discussed historical health system approaches to probity and missed opportunities to develop robust quality assurance which have been perceived negatively by both GDPs and health system actors and contributed to a lack of system 'buy in' among GDPs. One such context being a 'blanket' rather than targeted approach to probity – namely with respect to GDP contractors being asked to make self-declarations and repay on over-claimed complex extractions. At health system level, some suggested that suboptimal claims data validation contributed to blanket approaches to probity.

Among GDPs, this triggered a range of mechanisms. For some, the immediate response was upset and panic (with some reportedly making overpayments to the health service) and a perception that they had done something wrong. For others, notably GDPs who were committed to the scheme or who had not engaged in opportunistic behaviour, this scenario trigger feelings of unfair and disproportionate treatment by the HSE.

The way in which health system management communicates with GDPs on probity (and other issues such as patient complaints) and the language adopted was perceived by GDPs (and indeed some within HSE management) as unfriendly, confrontational and accusatory, which contributed to feelings of wrongdoing among dentists, mistrust and suspicion.

There were expressions of disappointment among interviewees that a peer-led probity scheme did not reach maturity or see widespread implementation. The initiative saw GDPs undertaking checks

on each other's patients and was perceived as a positive, collegiate process among GDPs and one which facilitated GDP system 'buy in'.

The contexts and mechanisms above broadly appear to have resulted in broad GDP dissatisfaction and disengagement from the scheme with some leaving as a result, however for some who choose to remain in the scheme, they reported underclaiming on certain treatments to avoid triggering investigations (even if these were performed legitimately). More broadly these factors have contributed to a system that is widely perceived as adversarial and lacking in symbiosis or collegiality between health service management and frontline GDPs.

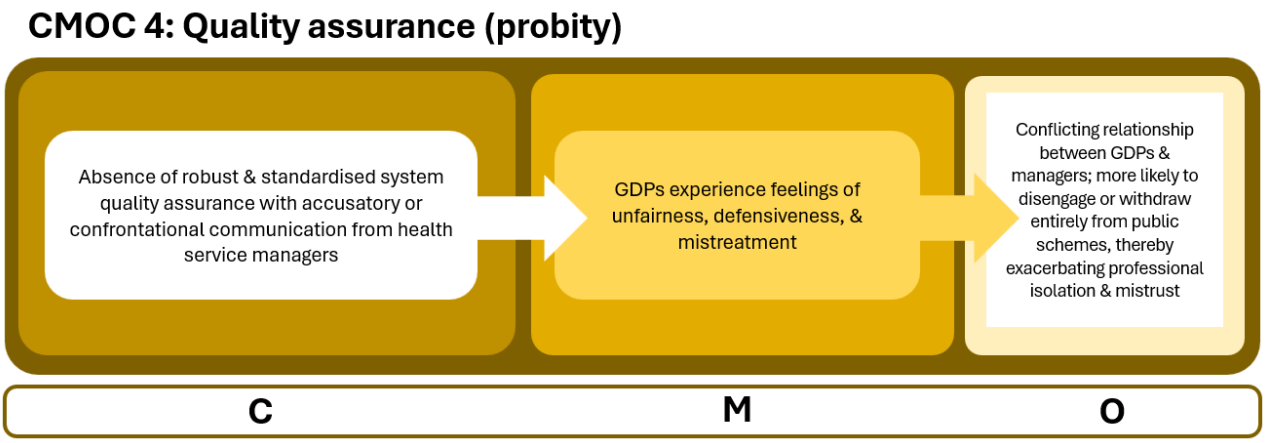


Figure 21: Consolidated CMOC 4: Quality assurance (probity)

5.6.2.5 Consolidated CMOC 5: Communication and engagement

The final CMOC (Figure 22) investigates multiple contexts centred around how the health system and profession engage and communicate with one another. At its highest level, there were reports of fractious collective contract negotiations taking place between the health system and professional representatives which were perceived as unilateral, dictatorial and inflexible by and on both 'sides'. This context has triggered a mechanism of polarisation and entrenchment of established positions, leading to suspicion and ultimately a loss of trust and an absence of symbiosis between the system and profession. A notable manifestation of this was the collapse of a formal consultative forum between the Irish health system and dentists, which was established to maintain stable contractual relations.

Like CMOC 4, interviewees working within health service management reported that while some written communications with GDPs may be overtly dictatorial and accusatory in tone, they felt there was a propensity for GDPs to perceive any health service correspondence as unfriendly, accusatory or confrontational (irrespective of the actual intent) and that receipt of these communications had the effect of triggering a mechanism of defensiveness and outcry among many GDPs. This had resulted in health service management feeling less willing to engage with GDPs for fear of backlash. They recognised that this had contributed to and was reinforced by an adversarial culture and loss of trust and had resulted in GDP disengaging with the health system and leaving the state scheme.

More widely, interviewees perceived that there was an absence of effective consensus and feedback mechanisms or open channels of communication between frontline GDPs and the health system. On system change and governance, there was a perception of a lack of meaningful engagement between the health system and GDPs, and that decisions were often made unilaterally and without consensus or communication (or with minimal engagement only). These contexts have had the effect of triggering perceptions among GDPs that they are ignored by the health system, not involved in decision making processes and ultimately that they are isolated and not part of the system. Interviewees on both sides cited the abolition of local monitoring committees which were forums for GDPs and health service officials to engage with one another and discuss local service operations, as instrumental in creating distance between frontline GDPs and the system, increasing their sense of isolation. Conversely, some working within health service dental management perceived that some GDPs themselves were not willing to engage in conversations on system change or 'ownership'. The above contexts and mechanisms have led to reduced GDP system 'buy in', increased demotivation and disengagement with state dental care,

with some reducing their commitment or resigning their contacts in favour of wholly private care provision. In contrast, both health system actors and GDPs reported that when there are open channels of communication and collaborative working arrangements between local health service management and GDPs, this triggered perceptions among GDPs that they were listened to, understood and supported, leading to sustained engagement in state funded care and improved working relationships between practitioners and local health service management.

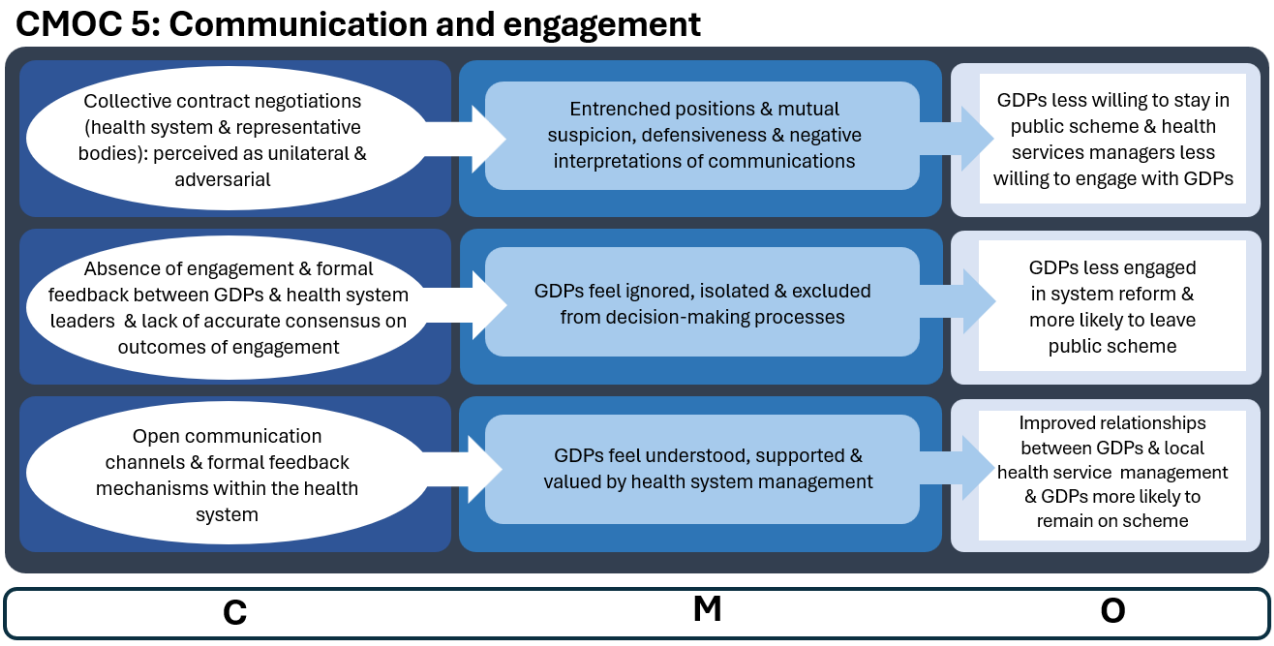


Figure 22: Consolidated CMOC 5: Communication and engagement

5.6.3 Overarching programme theory

Informed by the CMOCs outlined above, our overarching, final programme theory provides a full explanation of the study's findings (Figure 23). This research found that GDPs' engagement with state funded dental care in Ireland is informed by a myriad of complex and interacting health system factors. These include low political and resource commitment to oral health, financial incentives which are perceived as unfavourable and deficits in system governance, administration and communication. These dynamics have led to professional dissatisfaction and dissonance among GDPs, mistrust of the system, and disengagement from state funded care however the influence of various systems and local level factors can be seen to act as countering forces to such disengagement (Figure 23).

When oral health is deprioritised politically and marginalised within the health system, and amidst historic challenging financial circumstances, this can lead to fragmentation of services and contracts which are designed around cost containment with minimal service or financial supports available to contractors. Against a backdrop of rising business costs, when contracts limit the treatment options available to GDPs, this can contribute to financial and professional burdens. These conditions can result in perceptions among GDPs that dentistry is politically undervalued, and that state funded care is unsustainable, particularly when juxtaposed against a more lucrative (and autonomous) private dental market driven by professional and societal emphasis on cosmetic treatments and absence of state supported system mentorship. These system dynamics can reduce the attractiveness of state schemes, most notably among early-career or urban-practising GDPs. Conversely, economic imperative, community ties and moral obligation to service public patients can sustain GDPs' participation in state contracted care.

Compounding GDP dissatisfaction are contract governance processes such as prior approval and probity. While these seek to provide contract oversight and accountability, there can be a lack of clarity and inconsistencies in how these are operationalised by health system managers. Coupled with the content and perceived tone of health service communications, GDPs may perceive these processes as overly bureaucratic and accusatory, undermining their sense of clinical autonomy. This can erode professional morale, reduce trust, and lead to defensiveness, strained relationships between GDPs and health system managers and disengagement from public schemes. Management flexibility and GDP involvement with these governance processes have the potential to increase GDP 'buy-in'.

Finally, efforts at engagement and consensus building through formal negotiations have been mired in perceived unilateralism and inflexibility on both sides resulting in entrenchment of positions, a

breakdown in dialogue and the loss of mutual trust. The loss of local consultative structures has diminished opportunities for feedback and ongoing collaboration, leaving GDPs feeling voiceless, isolated, and less willing to engage with the state health system. Where formal and informal structures are in place that facilitate open communication, feedback and consensus building between the health system and GDPs, these can further act as counterbalancing forces and promote GDPs' engagement.

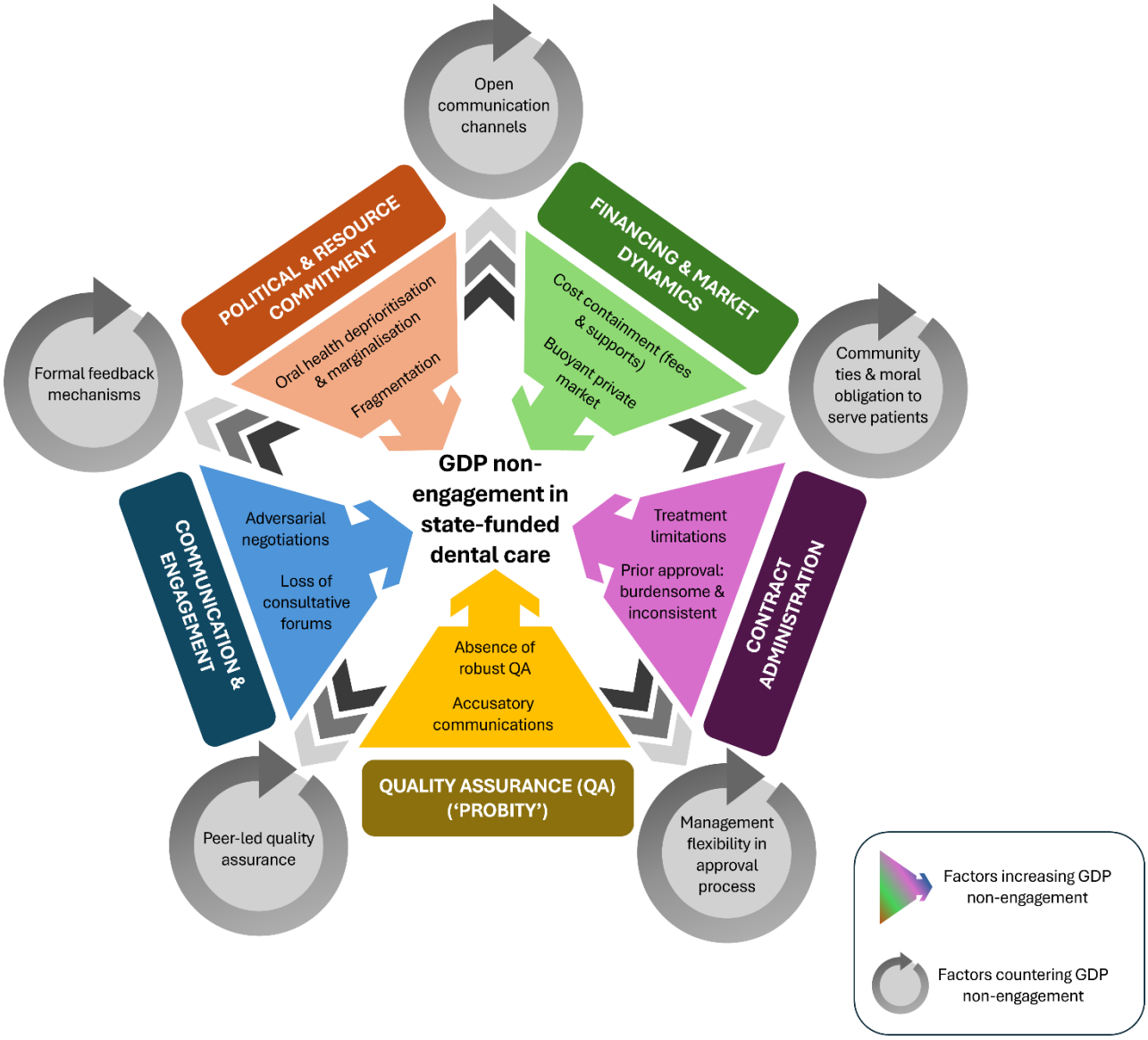


Figure 23: Realist interview study overarching programme theory

5.7 Discussion

This realist interview study expands on an earlier realist review of the international literature by the same authors and explains how health system-related contextual factors and hidden mechanisms interact to produce outcomes related to private GDP engagement in state funded, contracted primary oral healthcare for low-income adults in Ireland (Leavy, Symmons, et al., 2025). This research comes at a crucial time when the Irish health system is experiencing a reduction in GDP engagement in HSE-funded care and against a new policy framework wherein it is anticipated that GDP contractors will provide a greater volume of care on behalf of the state, including care for children (Department of Health, 2019; Leavy, Fleming, et al., 2025). As outlined in our overarching programme theory, we found that when oral health is deprioritised politically this can lead to marginalisation and fragmentation of services within the wider health system. A complex web of interacting factors such as financial disincentives, contract restrictions, system governance shortcomings and an adversarial communication and engagement environment, can lead GDPs to experience a loss of autonomy, loss of trust in the system, low morale, and isolation. Coupled with a buoyant private market, over time this can lead to demotivation, and ultimately, disengagement from the public system and migration towards wholly private care. When countered by locally responsive and supportive health service management and open channels of communication which engender a culture of reciprocity, mutual understanding and trust between the health system and the profession, the negative impacts of some of these factors on GDP engagement may be lessened.

As Ireland looks to strengthen its oral healthcare system in anticipation of *Smile agus Sláinte's* implementation and meet its international obligations on achieving UHC for oral health by 2030, this study, for the first time, provides robust, primary evidence for system leaders and managers to identify points of leverage for system change and optimise GDP-contractors' engagement in state care. As highlighted in our earlier review and by others, engaging private GDPs in publicly funded primary oral health as third-party contractors remains a global challenge and is therefore not unique to Ireland (D. Evans et al., 2023; Leavy, Symmons, et al., 2025; Nwachukwu et al., 2024). This is important in the context of the WHO GOHAP which implores member states, including Ireland, to increase workforce capacity to deliver essential packages of care and *"ensure that investment in human resources for oral health is efficient, sustainable and aligned with the current and future needs of the population"* (World Health Organization, 2024). While the GOHAP highlights the need for workforce expansion through for example, updated scopes of practice, and greater use of task shifting or mid-level practitioners, it recognises the importance of private dental

providers and asks member states to explore ways to optimise their engagement in contracted schemes.

From a health systems perspective, the existing evidence pool on this topic in Ireland is very shallow. To date there have been reports and policy papers published by the Irish Dental Association which include excerpts from GDP members' surveys highlighting many of the same challenges surrounding engagement in the DTSS as uncovered in our study. These include austerity cuts to scheme funding and clinical constraints within contracts (Irish Dental Association GP Committee, 2019; O'Neill, 2022). While these publications provide useful summaries of the extant problems with state schemes in Ireland from the perspective of GDPs, they do not provide an in-depth appraisal of health system level contextual factors at play or a level of data richness that begins to explain the relationships or causal patterns between these contexts and subsequent GDP (or indeed system) behaviour. From a high level health system and policy perspective, the findings of our study echo those of McAuliffe et al (McAuliffe et al., 2022). Their health policy-focussed case study which was also informed by elite interviews with Irish oral health actors, found longstanding deficiencies in primary oral healthcare political commitment, planning and resourcing in the 27 years following the publication of the Dental Health Action Plan in 1994. In particular, it highlights the impact of national level political and health service management 'disinterest' in public oral healthcare and funding cuts on the resourcing and operation of contracted schemes. Interviewees reported that they felt that the state had 'abandoned' GDP-contractors, leading to the decimation of schemes with some describing the DTSS as 'medieval' in its tooth extraction-driven approach, mirroring the sentiments of interviewees in our study.

From a scheme governance perspective, there have been longstanding concerns regarding the absence of robust quality (probity) assurance, accountability and standards in the Irish oral healthcare system. Commencing in 2002, a series of reports commissioned by the Department of Health highlighted deficiencies in probity assurance approaches and estimated that at one time, approximately 10% of DTSS claims were likely to be inappropriate (Oral Care Consulting Ltd, 2009). Despite some progress being made in the mid-2000s, a 2009 report concluded that the QA system was unfit for purpose and positive aspects that had been developed, for example the peer-led examining dentist scheme, had collapsed, exposing the system to significant risk.

More broadly, the findings of this study align with those of our earlier realist review, reinforcing the international literature but with some notable differences which are most likely attributable to system or contract variances. Common findings which informed our original CMOCs and which we have expanded upon in this study include low priority and funding for oral health, system change

without consensus and contracts restricting GDP clinical decision-making leading to feelings of lost control, mistrust, and being undervalued by the health system. Another prominent finding from the earlier realist review relates to GDPs' perceived inability to deliver high quality care on state dental contracts – specifically on the National Health Service (NHS) General Dental Services (GDS) contract in England. The pressure of reaching clinical targets ('Units of Dental Activity') set by NHS commissioners, coupled with perceived low remuneration had resulted in GDPs feeling like they were unable to deliver a high standard of clinical care to their NHS patients leading to professional burnout (Leavy, Symmons, et al., 2025). In contrast, in the present study we found that while GDPs lamented the limited (and perceived outdated) basket of care available on Irish schemes, they did not report that they were hampered in their ability to deliver a high standard of clinical care to their public patients. This could be attributable to the smaller basket of restorative care available on Irish schemes and therefore less 'scope' for GDPs to deliver care which they perceive to be sub-standard. In contrast, under the GDS contract in England, GDPs are required to deliver any and all routine and urgent dental care required *"to keep the mouth, teeth and gums healthy and free of pain"* (The King's Fund, 2023). These 'mandatory dental services' place few, if any *technical* restrictions on the types or volumes of routine treatments that can be offered (The King's Fund, 2023). Differences in remuneration and public service commitment may also be factors. As of June 2025, DTSS contractors in Ireland are reimbursed to the value of €242 for an oral examination, cleaning and two fillings compared to an average of £84 (€100) for delivering the same (or indeed a higher) volume of care in England (Flanagan, 2022; LDC Conferation, 2024). Our realist review found that capped (and perceived low) remuneration on public contracts, for example the NHS GDS, incentivised some GDPs to treat large volumes of patients, deliver high volumes of treatments at speed and sometimes 'cut corners' to maintain productivity and profitably (Leavy, Symmons, et al., 2025).

On public/private split, a recent NHS England report highlighted that dentists holding GDS contracts dedicated approximately 70% of their clinical time to NHS work (NHS Digital, 2024). Multivariate analysis also revealed that the more time GDPs spent on NHS work, the lower their levels of motivation were. While no comparative data exists in the Irish context, it is estimated that, inversely, almost two thirds of dental care in Ireland is delivered privately and paid for out of pocket (Henry et al., 2021). So, while GDPs reported financial pressures associated with state care delivery in Ireland, these may be less profound than in England and without the same level of health system oversight or pressure to deliver on targets.

5.7.1 Strengths and limitations

To the authors' knowledge, this is the first primary research study to directly address this topic in the Irish context, therefore a notable strength is that it helps fill a significant knowledge gap. By adopting a realist approach to this complex area of inquiry, and utilising CMOCs from the realist review as the initial programme theory, we uncovered a range of high-level system factors acting as modifiable contexts and causal patterns influencing private contractors' participation in publicly funded dental care in Ireland, providing in-depth analysis specific to that health system. This deepens our understanding of why GDPs are increasingly reluctant to engage in state contracts for the provision of primary oral healthcare to low-income groups. A key strength of this study is that it captures a wide range of perspectives from diverse system actors with expertise and experience at all levels of primary oral healthcare in Ireland including frontline practitioners, health policymakers and health service managers. This allowed for an adequate level of data sufficiency to expand on our initial programme theory and inform our new CMOCs. While the causal patterns identified are based on data which are largely representative of, and therefore specific to Ireland's oral healthcare system, we have presented our findings at a level of abstraction which is high enough so that they can be applied more widely to other health systems which use contracted care models. It must be noted however, that while interviews generated data which were, from a realist perspective, both contextually and mechanistically rich, they are representative of the opinions, attitudes and experiences of study participants and therefore can be highly subjective, as is common in qualitative methodological approaches (Manzano, 2016). Unlike other realist studies, for example realist evaluations, which may triangulate qualitative findings with quantitative data or documentary analysis, this study was entirely reliant upon qualitative data and the perceived experiences, opinions and attitudes of interviewees (Wong et al., 2016). Caution should therefore be exercised when interpreting these findings as the ultimate truth on this subject. Another limitation of note is that we did not include patients in our recruitment sampling frame owing to this study's primary focus on the health system and GDPs. While their perspectives are not directly represented in the study's findings, we did include a patient and public representative with experience accessing the DTSS on our Project Advisory Group.

5.7.2 Policy implications: 'Us and them' – shifting from mutually reinforced disconnection to a trusted shared-learning partnership

Notwithstanding the multitude of health system factors identified, it is the apparent disconnect between GDPs and the health system that appears to permeate through many of the CMOCs and impacts on the functioning of the primary oral healthcare system in Ireland. Specifically, how the dental profession and health system engage with one another on various levels, appears to

continually reinforce a cycle of mistrust and suspicion which ultimately leads to siloes, impasses, the absence of collaborative working and disconnect between these two key pillars of the health system (leadership/governance and the workforce).

The CMOCs outlined above demonstrate how policy decisions around primary oral healthcare system design and resourcing can result in system fragmentation whereby frontline GDPs are perceived to not be fully embedded within or supported by the health system. As third-party contractors, GDPs are perceived as separate entities, existing at arm's length to, rather than an integral part of the oral healthcare system in Ireland. These factors, coupled with the perceived deprioritisation of primary oral healthcare during the austerity and COVID-19 pandemic periods, have resulted in GDPs feeling isolated, devalued, not part of, and untrusting of the system. On system governance and communication, the way in which some GDPs react to health system managers' attempts at engagement was perceived as being overtly negative and reactionary and is symptomatic of their mistrust and isolation. Conversely, the manner in which health system management engages with GDPs on matters such as prior approvals, probity and patient complaints was frequently perceived as confrontational or dictatorial and only serves to reinforce a culture of mistrust, adversarialism and a lack of symbiosis between the two parties. It was suggested that the language adopted by the health system fuelled negative perceptions, for example the terms *'probity'* and *'inspectors',* and that this was an important context in terms of how GDPs perceive health system actors. Both health systems and GDP interviewees attributed these factors to a culture of adversarialism where the health system is perceived as the *'police'* and had resulted in further GDP isolation, mistrust, suspicion and unwillingness to engage constructively with the health system. The apparent chasm that exists between the two sides can be summed up in the following quote:

"it's definitely an 'us and them'. They don't trust us, they don't think we trust them and we're not working together"- Interviewee 9

Away from frontline clinical practice, this disconnect and breakdown in relationships can also be seen at the highest level between health system leadership and professional representatives. Collective negotiations on contracts and system reform were reported to have ended without consensus as a result of what is perceived to be inflexibility and a reluctance to accept concessions or move on set positions. These polarised stances appear to act as reinforcing agents for one another, deepening entrenchment of positions and creating standoffs. There were perceptions on both sides of a lack of understanding of the challenges faced by each party, for

example, running a dental practice as an ongoing concern or implementing a new directive or national policy, and that each side was motivated to a large extent by serving their own interests.

GDP non-engagement with state funded dental care is a complex, wicked problem, the aetiology of which lies within a myriad of interwoven health system factors as demonstrated through our CMOCs. Central to this problem is the historical and current tension between the health system and the profession over contractual arrangements to provide publicly funded care (within an increasingly buoyant private market), alongside a requirement for collaborative working in order to reach consensus on service design and ultimately the provision of better care to the population. Resolving this, through for example, clearer contractual arrangements and agreements taking place within formal frameworks or mechanisms that would facilitate transparent, open and collaborative engagement and feedback between the profession and health system (at all levels) could act as a worthwhile starting point for leveraging positive system change. This could potentially unlock opportunities for shared learning, decision making, and partnerships built on mutual understanding and trust where the common goal is increasing timely access to care for patients and reducing oral health inequalities.

5.8 Chapter conclusion

This chapter has described the methods, analysis and results of the realist interview study which produced 13 individual and abstracted CMOCs, five consolidated CMOCs specific to the Irish system and one overarching programme theory. Based on data collected from 19 interviews, the findings of this study provide an explanation of how complex and interwoven health system factors can trigger a range of mechanisms which subsequently influence private GDPs' engagement in state-funded care for low-income adults.

The findings show that factors such as suboptimal oral healthcare system financing and resourcing, outdated and restrictive state contracts, system administration and governance processes which are perceived as punitive or accusatory and the absence of open communication and engagement between the profession and health system, can trigger a range of sentiments among GDPs including loss of autonomy, mistrust of the system, demoralisation, and professional isolation. When the private market in oral healthcare is strong, this can compound GDP demotivation in the public system and lead to disengagement in favour of the private sector. Messaging from within GDPs' professional networks can reinforce dissatisfaction in state-funded care and further encourage the shift towards the private sector. Conversely, weak markets in oral healthcare or strong local community ties, can encourage GDPs to remain in state funded care. This study also found that when there are open channels of communication and engagement

between the health system and GDPs and when health service management is perceived as supportive, this has the potential to foster mutual understanding, trust and reciprocity, thus countering some of the negative influences responsible for driving GDPs away from the public system.

Chapter 6: Discussion and conclusion

6.1 Chapter outline

The overarching aim of this thesis is to explain health system factors that influence private general dental practitioners (GDPs) participation in state (publicly) funded, contracted primary oral healthcare services in high income countries, including Ireland. More specifically, I set out to provide an evidence base that contributes to informing the future participation of GDPs in state funded care in Ireland, in the context of workforce and service reforms proposed in *Smile agus Sláinte* - National Oral Health Policy (2019).

In this, the final chapter of the thesis, I will synthesise the results outlined in chapters three to five by providing an overarching and coherent outline of the findings from the three studies which build on one another (Figure 24), beginning with a brief overview of the findings of each of the three studies below. I conclude this chapter and the thesis by discussing the strengths and limitations of this research, reflecting on my role as a researcher in this topic area, suggesting implications for future research and practice, and providing an overall conclusion.

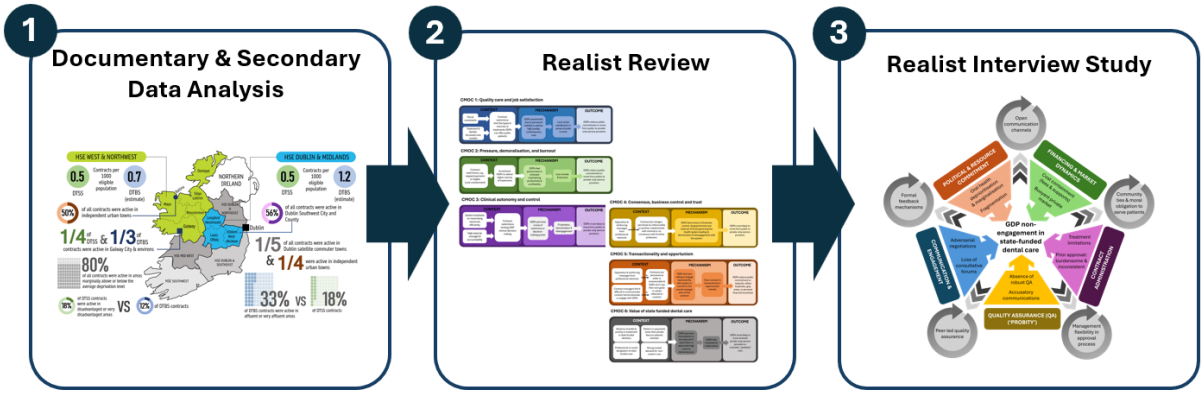


Figure 24: Flow of thesis studies

6.2 Summary of methods and findings

Broadly speaking, this PhD is health systems analysis which comprises the following types of analyses: documentary and secondary data analysis and realist approaches. Each of the three studies draw upon a wide range of data from diverse sources including health system datasets and documents, peer reviewed and grey literature, and interview data from frontline dental practitioners and health system elites in Ireland and elsewhere. The documentary and health

systems analysis outlines the key system challenges with respect to the Irish GDP workforce and therefore frames the problem under investigation in this thesis, acting as the springboard for the subsequent realist analysis. The results of the realist review and realist interview study are presented at a high level of abstraction and therefore the causal explanations within them are transferable to other systems which utilise models of contracted dental care. The realist interview study also presents a detailed description of the CMOCs in action specifically in the Irish system.

6.2.1 Study one: Documentary and secondary data analysis findings (Leavy, Fleming, et al., 2025)

Study one entitled *"Primary oral healthcare in Ireland: a health systems analysis of publicly funded contracted services delivered by the general dental practitioner workforce"* is a documentary and secondary data analysis which provides a detailed overview of the state funded primary oral healthcare system in Ireland and its origins. The research traces the integral role that private GDP contractors have played in the delivery of state-funded primary dental care in Ireland since the early 1950s. Crucially, this study found that the number of private GDPs holding Dental Treatment Services Scheme contracts for low income adults fell from 1,664 in 2016 to 787 in 2023, while the number of GDPs clinically active on the scheme also declined from 1,318 in 2016 to 831 in 2022. The decline in the number of DTSS contracts and claims submissions has coincided with Ireland's post-recession economic recovery, the COVID-19 pandemic and recent inflationary period. Importantly, this decline comes at a time when Ireland's population is growing, and aging with greater oral health needs. Conversely, the number of GDPs holding Dental Treatment Benefit Scheme contracts for publicly insured adult workers increased from 1,959 in 2016 to 2,384 in 2023. This analysis found that DTSS contractors are more likely to be male and qualified longer (greater than 20 years) compared to GDPs holding only DTBS contracts.

6.2.2 Study two: Realist review findings (Leavy, Symmons, et al., 2025)

Seeking to understand why, study two entitled, "*How and why do health system factors influence general dentists' participation in publicly funded, contracted primary dental care services: A realist review"* identified a range of health system factors acting as contexts influencing private GDPs participation in state funded, contracted primary oral healthcare services. These include low political and systems priority for oral health, system emphasis on treatment rather than prevention, and a focus on dentists as the main providers of oral healthcare. At societal level there may be strong market demand for private oral healthcare. Contractual constraints were linked to constrained funding and cost-containment, systems emphasis on efficiency and managerialism, and limitations on clinician autonomy. Furthermore, the implementation of system change was often characterised by minimal frontline clinician input and consensus building accompanied by

opposition and reinforcing negative messaging from GDPs' professional networks. Concurrently, there may be pressures on contract managers or commissioners, hindering their ability to flex contract terms and conditions.

Key underlying mechanisms triggered among GDP contractors in these contexts include the loss of clinical and business control and a perceived inability to deliver high quality care. These experiences can contribute to loss of job satisfaction, frustration and increased levels of stress and demoralisation. Over time, this can lead to demotivation, and disengagement with state care and give rise to transactional or opportunistic behaviours, especially when GDPs don't see their own goals reflected in state systems. More broadly, these contexts led to mistrust of the health system and GDPs feeling undervalued.

The final programme theory which is informed by the six consolidated CMOCs (figures 15 and 16 above) shows how private GDPs' decisions to participate in state funded care are dependent on a range of mechanisms triggered in specific contexts. It found that health systems often lack priority and funding for primary oral healthcare. Where care models that are treatment-orientated (rather than preventively orientated and focused on delivery by dentists are prioritised, cost containment measures are often built into dental contracts which can limit GDPs' decision making, resulting in perceived inability to offer high quality, holistic care to public patients. These, combined with low reimbursement rates (compared to private market rates), high patient volumes, clinical targets and a high degree of health system oversight and managerialism, can lead to demoralisation, stress, burnout, and a perceived loss of professional autonomy among GDPs. When contracts are implemented, amended or operationalised with minimal communication or consensus with frontline GDPs, this can lead to feelings of ceded entrepreneurial control and fuel mistrust of those governing the health system. These feelings may be amplified by negative messaging from within GDPs' professional networks. Perceived low patient priority for publicly funded primary oral healthcare can lead to GDPs feeling undervalued. This may be felt particularly where state contracts feature low or no patient co-payments or where patients do not engage or comply fully with care.

6.2.3 Study three: Realist interview study findings (under peer review)

Lastly, the realist interview study entitled "*'Us and them': a realist interview study exploring how and why health system factors influence dentists' participation in state funded, contracted primary dental care for low-income populations in Ireland"* builds directly on the realist review and begins to provide a more in-depth explanation for how and why some of the findings outlined in the health systems analysis have occurred – namely with respect to the declining numbers of GDPs engaged

in HSE-contracted dental care in Ireland. This study uses four of the six CMOCs from the realist review with the aim of understanding how and why health system factors influence private GDPs engagement in state-funded, contracted primary oral healthcare for low-income adults (the DTSS) in Ireland.

The realist interview study found a series of inter-related health system factors acting as contexts, consequently triggering a range of mechanisms which impact on GDP participation in the DTSS in Ireland. At its highest level, it found that an absence of political priority for oral health can result in its marginalisation within the health system and the fragmentation of services, for example the absence of supports for GDPs, leading to sense of isolation and abandonment among GDPs. Against a backdrop of austerity-driven cost containment, contracts can limit GDPs' prescriptions leading to a sense of lost control, professional dissonance and financial pressures. This can result in GDPs perceiving that state funded oral healthcare is undervalued, and financially unsustainable, especially amid rising professional costs and a lucrative private market, driven in part by changing societal and professional norms with respect to oral healthcare, and the absence of public system mentorship. Further and notable contexts triggering dissatisfaction among GDPs in the Irish system are contract administration and oversight processes such as prior approval and probity assurance. This study revealed that a perceived absence of standardisation in how these processes are operationalised alongside health service communications which are perceived as confrontational or dictatorial can trigger a range of sentiments among GDP contractors. Many perceived these administrative or oversight processes as burdensome and accusatory, leading to a sense of micromanagement, defensiveness, loss of trust and strained relationships between GDPs and the health system.

Lastly, a common theme running through this strand of the research is the disconnect between GDPs and the health system. The way the profession and health system engage and communicate with each other, characterised by unilateralism and entrenchment of positions, has resulted in a culture of mistrust and suspicion which ultimately leads to and reinforces siloes and the absence of dialogue, consensus and collaborative working between the two sides. Coupled with the absence of formal consultative or feedback mechanisms for frontline GDPs, this can further their sense of isolation within the health system.

6.3 Integration of study findings

In the following sub-sections I discuss how the three studies in this PhD thesis relate to one another. I will also outline several integrated themes (and areas of difference) which have emerged from each of the analyses across the three studies in chapters three, four and five respectively.

6.3.1 Relationship between thesis studies

The documentary and secondary data analysis (study one) in chapter three sets the scene for the overall thesis by describing and tracing the origins of the Irish primary oral healthcare system and clearly outlining *what* the existing challenges are with respect to private GDPs' participation and engagement in state-contracted dental care using publicly available, contemporaneous health systems and other data. When I embarked on this PhD, there was little primary research identified in this subject area, therefore this became the starting point and rationale for study one.

The study maps available dentist workforce indicators against a recognised WHO workforce framework and begins to examine some of the trends in the GDP workforce as they relate to participation in state dental schemes in Ireland; namely practitioner-level and dental practice characteristics. While this study provides some useful insights into the types of dentists holding contracts for the two state schemes in Ireland (and the differences between them) and a timeline of the changes in GDPs' participation in the DTSS (mapped against broader economic, public health and geopolitical contexts impacting on the Irish health system) by the very nature of the data and methods used it does not explain, in detail, *how* or *why* these trends have unfolded.

Where documentary and secondary data analysis defines and quantifies the problem under investigation in this thesis (in the Irish context), the realist review and realist interview study (studies two and three) subsequently explore the reasons *why* we have witnessed a decline in the number of private GDPs participating in state-funded, primary oral healthcare in high income countries (including Ireland), from a health systems perspective. The realist review explores *how, why* and *under what circumstances* health system factors influence private GDP's participation in state contracted care from an international perspective. The realist interview study builds on the realist review by exploring in depth *how*, *why, for whom* and *under what circumstances* health system factors influence GDPs engagement in the publicly funded scheme for low-income adults in Ireland, thus providing detailed causal explanations for the findings outlined in the health systems analysis.

In this thesis, the two realist studies (studies two and three) utilise two different realist methodologies to provide a deeper insight into the issue under investigation. The realist interview study explicitly builds on the realist review by investigating a subset of findings, applying them specifically to the Irish context to explain causation for or the aetiology of this complex problem identified in study one (chapter three), that is, the shortage of GDPs in providing publicly funded care to adults on low incomes who qualify for care under the DTSS. The realist interview study therefore represents a logical and seamless progression of the realist review, examining this

specific topic, for the first time in Ireland through primary research. As previously highlighted in chapter three (methodology) the methodological approach in study three shares many similarities with realist evaluations with the notable exception of triangulation of findings. While triangulation of findings with quantitative data or other sources was not a feature *per se* of the realist interview study in this thesis, some of the findings do correlate with those of the documentary and secondary data analysis, for example, the influence of the broader economic and socio-political conditions on health system and contractor behaviour. In the next section, I triangulate findings from study one and three to assist the research process and deepen the understanding and interpretation of the findings. By bringing the field of inquiry back to Ireland, the realist interview study serves to close the loop in this thesis. Owing to both realist studies being conducted within the school of Pawson and Tilley and informed by RAMESES standards and guidelines, they share similarities in their design, objectives, methodological approaches and reporting of findings. An in-depth appraisal of these studies' commonalties (and their differences) is provided in section 6.3.3 on integrated themes below.

6.3.2 Integrated themes

In this section, I bring together the findings of each PhD study (chapters three, four and five) where appropriate and relevant, to generate an integrated discussion of cross-cutting themes. To inform the development of a coherent synthesis, thematic analysis (TA) in the style of Braun and Clarke was adopted (Braun & Clarke, 2006). I revisited the key findings for each of the three studies applying inductive analysis to identify thematic patterns across the work packages. TA is a widely used and flexible method for identifying and analysing patterns or themes within qualitative datasets (Clarke & Braun, 2013). TA can be applied across multiple research fields including health research and social sciences and can be used to analyse different types of data including secondary data and interview transcripts (Campbell et al., 2021).

The integrated analysis in this chapter has resulted in the development of seven overarching themes, bringing together (and where appropriate comparing and contrasting) the findings from the studies and situating them in the broader international literature.

These themes that emerged are:

1. Low political priority and marginalisation of oral health
2. Discordance between contemporary practice in oral health and system funding
3. System financing and market dynamics
4. Competing institutional logics between private providers and health systems
5. The dental profession: influence of culture and networks

6. Mistrust between the state and privately practising dentists
7. Declining GDP engagement and patient access

These are presented below.

6.3.2.1 Low political priority and marginalisation of oral health

As demonstrated in this thesis' findings, the aetiology of private GDPs' non-engagement in state contracted primary oral healthcare, specifically for low-income groups, while complex, can ultimately be found in the limited political priority for oral health and its lack of visibility within wider health systems. This lack of priority and visibility can influence how contracted primary dental care services are designed (or reformed), resourced and integrated within the wider health system, and at what pace. Juxtaposed against other factors, for example, lucrative private markets, this subsequently influences how GDPs can practise, how they perceive their role as healthcare professionals and their sense of value practising within public systems, thus influencing their motivations to provide publicly funded care or not.

Study one of this thesis illustrates the impact of abrupt budgetary cuts to state dental schemes, introduced by the Irish Government following the 2008 global financial crisis on DTSS expenditure and clinical activity. At the time, cuts to state dental schemes in Ireland were deeper and occurred much quicker than for other health and social care services, reflecting their deprioritisation and low political weight (Johnston et al., 2020). This was followed by a long fallow period up to 2022 during which no or minimal new investments or reforms were made to state dental schemes (Department of Health, 2022a). This was despite the economic recovery, increasing tax returns to the Irish exchequer, repeated calls for reform from the profession and a new national oral health policy (Irish Dental Association, 2016; O'Neill, 2022). Crucially, to contain costs, this deprioritisation and subsequent reduction in scheme expenditure resulted in contract changes which have severely limited GDPs' prescription and autonomy (Burke, 2010). As study one shows, while these abrupt cuts did not result in an immediate drop off in DTSS participation (most likely due to a weakened private market at the time, as postulated by interviewees in study three and discussed in more detail in section 6.3.3 below) it led to deepening dissatisfaction with the scheme, and, over time, fed into a wider sense of state abandonment and lack of political worth amongst GDPs as uncovered in studies two and three. The two realist studies delve deeper, highlighting how political and health systems disinterest and lack of priority for oral health have manifested and further contributed to GDP non-engagement in state contracted care in Ireland and elsewhere.

These findings reflect and add to an ever-expanding body of literature and evidence on this theme. Oral health remains one of the most neglected aspects of global health policy (Watt, Daly, et al., 2019; Winkelmann, Gómez Rossi, et al., 2022). Oral healthcare, in particular primary oral healthcare has long been regarded as a 'Cinderella' specialty in healthcare and health systems, often overlooked and under-resourced leaving half the global population with some level of (largely preventable) oral disease (World Health Organization, 2022a). While this neglect and subsequent disease burden impact low- and middle-income nations the most, the fallout can also be seen in high income countries (Benzian, 2025). As highlighted in Chapter 1 (section 1.3.2), the most recent oral health epidemiological data available suggests that there are persistent levels of untreated oral diseases across the Irish population, including among older adults (Naseer et al., 2022), people with intellectual disabilities (Mac Giolla Phadraig et al., 2015) and children (James et al., 2021). In Ireland, dental caries in permanent (adult) teeth accounted for 37.15 disability-adjusted life years (DALYs) in 2021 (Institute for Health Metrics and Evaluation, 2025). This compares unfavourably to Ireland's nearest neighbour – the UK, where the figure was 33.2. One DALY equates to the loss of one year of full health (World health Organization, 2025b). Among Irish children, a cohort highlighted in the NOHP as severely lacking in access to routine and preventative care, the figure is starker. Caries of deciduous (primary) teeth in under 5 year olds accounts for 7.5 DALYs in Ireland compared to 4.1 in France, 4.2 in Germany and 5.3 in the UK, making Ireland a laggard in western Europe and despite community water fluoridation population coverage of approximately 70% (Lambe et al., 2022). Aptly reflecting oral health's political and system neglect, in study three, one interviewee described oral healthcare in Ireland as having been:

"…set up to be a poor relation, and poor relations are always embarrassing at Christmas" – Interviewee 2 (study three - extended dataset)

Despite decades of persistent advocacy backed by robust scientific evidence demonstrating the burden of oral diseases (and proposing potential solutions) the fight to push oral health up the global health policy agenda and put the mouth 'back in the body' goes on for the dental public health community (Benzian et al., 2025). Although progress has been made with the 2021 WHO resolution on including oral health within member states' NCD agendas, the publication of the GOHAP in 2023 and the Bangkok declaration in 2024, oral diseases were omitted from the recent *Zero Draft: Political declaration for the prevention and control of noncommunicable diseases* at the UN high level meeting on NCDs in 2025 (Benzian et al., 2025; World Health Organization, 2025d). While this omission and the aetiology of oral health's global neglect and marginalisation are historically complex, driven in part by dentistry's evolution as a separate health profession to medicine, leading to siloes and a perception that oral health is somehow separate to general health

and the private responsibility of individuals, it is oral health's political invisibility which has played a key role in maintaining its status as the *"poor relation"* in Ireland (and elsewhere) in recent decades (Benzian, 2025; McAuliffe et al., 2022; Watt, Daly, et al., 2019).

On the lack of political priority in the Irish context, in study three this was widely attributed to a perceived lack of societal or population importance for routine oral healthcare or advocacy for oral health from within civic society, a theme echoed in the international literature in study two and elsewhere (Benzian et al., 2011; Gallagher et al., 2007). The frustration felt by many interviewees on this can be summed up in the following quote:

> *"Dentistry isn't a priority for people. It's very quickly a priority at the weekend if they're in trouble. And I think, I was really shocked during the recession when the PRSI scheme [the DTBS] was cut right back, and the public didn't object. I thought that was, that was a great failure, actually, and I think, I think our public let us down." – Interviewee 14 (Study three - extended dataset)*

With the notable exception of orthodontics, oral healthcare in general was viewed as not being a *"vote winner"* for Irish politicians with greater importance, understandably being placed on access to other health services among the public, for example GPs and emergency departments – services which oral healthcare must compete with within health systems. Reflecting the view of many, in their interview in study three, Interviewee 8 remarked:

> *"Dentistry is not going to win votes. It never will. The only thing that really is going to motivate politicians to fund dentistry is if people are in the street looking bad" – Interviewee 8 (Study three - extended dataset)*

This finding with respect to political attention being given to orthodontics (over access to essential preventative and routine dental care) was mirrored by McAuliffe et al., (2022) and serves to highlight the mismatch between population health priorities and political motivations. It reinforces the idea that political 'short termism' and the quest to curry favour with constituents can inform the direction of oral healthcare (Hoffman et al., 2019). Similarly, in study two there were perceptions among GDPs that state funded dentistry was of little value politically in state health systems elsewhere. In the UK literature for example, GDPs there perceived that state funded, NHS dentistry was *'a side show'* (Steele et al., 2009). On the prevailing view among study three interviewees that patients do not prioritise or value oral healthcare, there is a dearth of primary qualitative evidence examining this topic in the Irish context therefore substantiating these views is a challenge. Despite this, there are some Irish data on oral health related quality life and service utilisation which shed

some light on this topic. According to the 2022 Healthy Ireland (HI) survey of 7,500 individuals aged 15 years or older, 81% of respondents self-reported having good or very good oral health while just under half (49%) of respondents reported having visited a dentist in the previous 12 months (Ipsos MRBI, 2023). These findings mirrored an earlier HI survey in 2018 which also found that unemployed groups and those living in socio-economically disadvantaged areas were less likely to attend a dentist (42% and 41% respectively) compared to those in employment (51%) or living in affluent areas (55%) (Ipsos MRBI, 2018). One-in-10 HI 2022 respondents reported their dental attendance was symptom-led (Ipsos MRBI, 2023). Similarly, a 2024 survey-based health needs assessment of 274 randomly selected households in Tallaght, south west Dublin found 49% of respondents reported attending a dentist once or twice in the previous two years (Stapleton et al., 2025). Regarding access to oral healthcare, high treatment costs and a lack of knowledge or available information on statutory entitlements to dental care have been reported as factors leading to non-engagement with services, especially among older and rural-dwelling medical card holders (Kennedy, 2014; Sheehan et al., 2017).

As outlined in study one, Ireland suffers from a lack of contemporaneous and standardised oral health data. This not only relates to oral health workforce data, but wider epidemiological data and other indicators and is a challenge faced by other countries across Europe and elsewhere (McAuliffe et al., 2025; Winkelmann, Gómez Rossi, et al., 2022; World Health Organization, 2022a). Notably, the most recent national oral health surveys in Ireland were conducted in the early 2000s (Whelton et al., 2006; Whelton et al., 2007) with sampling data from more recent studies such as the Fluoride and Caring for Children's Teeth (FACCT) study in 2017 increasingly being relied upon for epidemiological purposes (James et al., 2021). Research shows that poor oral health data intelligence can hamper efforts to advocate effectively to politicians and health system decision makers. This was raised in study three when it was suggested that the DTSS access crisis was exacerbated by a lack of political *'visibility'* on the issue – specifically the absence of metrics on levels of unmet need or waiting times for treatment. It was suggested that improved data intelligence on DTSS waiting times for example could act as a powerful advocacy tool and help in increasing the political salience of this issue among decision makers, as has also been suggested by others (Benedetti et al., 2015; Benzian et al., 2011). Indeed, the need for the smart use of oral health data routinely collected from dental practices as part of surveillance efforts has been highlighted by the WHO and reinforced in *Smile agus Sláinte* as key in assessing population oral needs and informing the planning and management of oral healthcare services and policymaking (Department of Health, 2019; World Health Organization, 2024).

6.3.2.2 Discordance between contemporary practice in oral health and system funding

An important theme to emerge from studies two and three is the continued use of primary oral healthcare models of care which are perceived to be outdated where prevention is largely absent, and the impact this has when filtered down to the level of the practitioner. This is framed within the wider absence of clear health system goals on population oral health outcomes, which subsequently influences the design, resourcing and operation of contracts. The literature unearthed in study two clearly points to health systems continued use of dental contracts where costly interventionalist ('curative') treatment approaches are incentivised over prevention and where primacy is given to dentists as the sole or main providers of oral healthcare (Barrow et al., 2023; Watt, Daly, et al., 2019). This is despite an ever-expanding and highly trained team of 'mid-level' dental auxiliaries or dental care professionals (DCPs) including dental hygienists and dental therapists who are well placed to deliver suites of essential preventative and restorative dental care (Gallagher et al., 2013). It must be noted that in Ireland, dental therapists are not yet recognised as a class of dental auxiliaries (Dental Council of Ireland, 2010). Dentistry is an expensive business and, paradoxically, these costly care models often operate within health systems where cost containment and rationing of services are prominent features. Therefore, the challenge for system leaders lies in designing public contracts which not only promote timely and equitable access to prevention and care, but which provide value for public money amid increasingly constrained fiscal envelopes (Brocklehurst et al., 2024). While these downstream approaches, delivered at scale, are key in contributing to population oral health outcomes (and are the focus of this PhD research), they should run in tandem with mid and upstream public health interventions which can better address the impact of wider health determinants and target inequities (Brocklehurst et al., 2024).

The international experience as outlined in study two is mirrored in Ireland in studies one and three but with some notable differences. As previously outlined, the larger of the two Irish contracted schemes (in terms of basket of care available) – the DTSS, is now infamous for its perverse incentivisation of extractions, and largely absent baskets of preventative or restorative care (without prior approval) – contract features which were adopted to contain costs following austerity measures introduced in 2010 (see section 3.6.1 above for more detail on the DTSS) (Burke, 2010). These limitations were consistently cited among both frontline GDPs and those working at health system level in Ireland, as being a major cause of dissatisfaction with the DTSS, contributing to GDPs' sense of lost autonomy, professional dissonance and low morale as epitomised in the following quote:

> *"I think that being in a situation when, when [the DTSS] was reduced to two fillings per year .... it really.... it was terrible really. .... you were leaving active disease like, and you were telling patients there's active disease here. There's active caries, there's active gum disease and then you know a lot of these patients may have lost some teeth and then perversely then they were looking for a partial denture and none of the research supports putting a partial denture into a mouth with active disease. And you know, ... it was just soul destroying"- Interviewee 17 (Study three - extended dataset)*

Conversely, while other health systems may not place the same emphasis on *limiting* the scope or volume of treatments that GDPs can offer, they can have the opposite effect by inadvertently or deliberately incentivising the delivery of high volumes of certain types of care to optimise remuneration (the dental 'treadmill') or achieve clinical targets set by health system managers (rather than necessarily to achieve optimal oral health for patients) (Gallagher et al., 2021b). This pressure to deliver at speed, coupled with the use of restorative materials that are perceived as substandard (to cut costs) can lead to perceptions of poor-quality care delivery among contractors. It has also been suggested that the NHS GDS contract in England has promoted supervised neglect, where GDPs purposely leave active disease untreated until the next course of treatment to minimise immediate financial loss or to maximise future financial gain, what's become known as *'splitting'* care or *'gaming'* the system (McDonald et al., 2012b). This contrasts with the Irish system highlighted in study three where limitations on the number of restorations permissible on the DTSS contract mean GDPs are left to either leave disease untreated, extract otherwise restorable teeth, apply to the health service to have these covered on prior approval or charge patients privately to save teeth. A further and notable contrast between the experiences of GDPs in England (outlined in study two) and Ireland (in study three) was that while each cohort largely criticised the respective contracts under which they both practised, for many of the same reasons, e.g., loss of clinical autonomy, Irish GDPs differed from their UK counterparts in that they did not perceive that the DTSS impeded their ability to deliver *high quality* clinical care. To the contrary, GDPs and health system managers in Ireland were roundly resolute that the quality of restorations provided on the DTSS, including the types of materials used was no different to that of privately funded care.

On system intent and objectives, in study three, there was criticism of the apparent lack of clear system aims (or consensus) on what the state funded primary oral healthcare system in Ireland is currently trying to achieve. This, participants felt, fed into many of challenges that currently exist with respect to the DTSS' design and operation. Study three shows that frontline GDP-contractors in Ireland want to deliver the best for their patients (public and private), and for the most part have

a sense of altruism or public service ethos however they feel they are practising within a system that does not support these endeavours. They reported perceiving the Irish system as one that does not prioritise oral health promotion (or prevention), does not address oral health inequities, and is not resourced or funded adequately. This represents a clear mismatch between perceived intent of the system and the frontline profession. As one health system elite interviewee stated:

> *"We don't even know what we're trying to achieve with the DTSS, you know, what are we trying to achieve? Are we trying to achieve dental health gain for the community it serves? And if that is the case, how do we know we've even done that? You know?"* – Interviewee 3 *(Study three - extended dataset)*

Similarly, reflecting on where the perceived political priorities lie in Ireland (and how these have influenced the system's design) and reflecting on the DTSS' outdated and limited basket of care (and absence of investment in prevention), one interviewee summarised the state funded oral healthcare system as follows:

> *"I just think, God forgive me..... it's potholes, it's orthodontics and it's Granny's dentures like" – Interviewee 17 (Study three -extended dataset)*

Recognising the slow pace of oral health systems change globally and reflecting the sentiment above, Listl et al. have stated that in order to achieve UHC for oral health, systems strengthening requires *"a clear understanding of existing problems, identifying options to address them, as well as implementation and evaluation of new approaches"*(Listl et al., 2023). Conversely, in study two, it appears from the UK literature that while the NHS GDS contract does espouse equitable access to population-wide, comprehensive primary dental care, GDPs there perceived that the system's focus on efficiency and value for money meant that *quantity* of care delivered (and patients seen) was prioritised over *quality* with prevention being disincentivised (Gallagher et al., 2009; Gallagher et al., 2021a, 2021b). This, as highlighted above, conflicts with their sense of ethical practice, professionalism and desire to deliver high quality, contemporary care and can lead to perceptions of being *'taken advantage of'* by the government (Gallagher et al., 2009).

However, lest this be construed as a purely negative appraisal of primary oral healthcare systems, in study three, there was recognition that when the DTSS was established in Ireland in 1994, it had a clear aim of increasing access to care and reducing levels of unmet need among medical card holders some 30 years ago. As outlined in the documentary analysis in study one and in detail by McAuliffe et al. (2022), the DTSS' early success was driven by clear policy intent (the 1994 Dental Health Action Plan) which was informed by contemporaneous epidemiological data and driven by

public outcry among medical card holders who struggled to access care, political pressure and will for change, and strong health systems leadership – an 'alignment of the stars' if you like. This 'alignment' might broadly be considered as emblematic of Kingdon's Multiple Streams Framework (MSF) in action wherein the interplay between the three streams of problem recognition, policy proposal, and the right political circumstances converge to create a window of opportunity for policy change (Kingdon, 2010). However, reflecting an international trend towards tooth retention and a reduction in edentulism, interviewees in study three were clear that the DTSS' original remit to largely provide extractions, dentures and some restorative treatments to adult medical card patients meant that the scheme had not kept pace with current thinking on prevention or minimally invasive dentistry (MID) and was no longer fit for purpose in 2025. As highlighted above and by others, deficiencies in oral health epidemiology and good data (as exampled in study one) not only hinder advocacy efforts but severely limit the ability of the health system to quantify the extent of unmet needs among the population and therefore appropriately plan, prioritise and fund both oral health promotion, prevention and downstream treatment services (Patel et al., 2016; Winkelmann, Gómez Rossi, et al., 2022). Despite the publication of *Smile agus Sláinte* in 2019 wherein it outlines a clear overall strategic direction and system intent which are in broad alignment with the WHO GOHAP, the current HSE primary oral health system including the DTSS, remains the brainchild of the 1994 Dental Health Action Plan and largely curative focussed (Department of Health, 1994a).

6.3.2.3 System financing and market dynamics

As one of the key building blocks of health systems, financing is, unsurprisingly, a key theme which appears consistently throughout the studies in this PhD. While this thesis has demonstrated the influence of several health system factors on GDP engagement in state-funded care, it must be recognised that without adequate funding, health systems cannot function properly and the job of health systems strengthening is made even more difficult. Aligning financial incentives for health care professionals including dentists with health policy goals is seen as a key challenge in health systems around the world and as the findings in thesis demonstrate, Ireland is a clear case in point (M. Tickle et al., 2011). There are a range of different remuneration approaches in dentistry, from salaried to fee for service and from capitation to bundled and blended payments (Woods, 2013). Each of these payment mechanisms come with their own pros and cons and none are perfect (Listl, 2024). At the risk of exceeding the word limit for this thesis and to allow for broader discussion of the various themes that emerged from this research, an in-depth appraisal of individual provider payment methods and their impact on GDP behaviour will not be provided here. While I will discuss aspects of remuneration that are directly relevant to the Irish system and

lessons that might be learned from health systems elsewhere, I will leave the wider discussion on the strengths and weaknesses of these reimbursement mechanisms to those who have extensive expertise in oral health economics and have already published widely on the topic (Brocklehurst et al., 2016; Chalkley et al., 2010; Grytten, 2017; Nolan, 2019; M. Tickle et al., 2011; Woods, 2013). However, in the following sections I detail some of the findings across the PhD related specifically to 'system financing' and 'market dynamics'.

6.3.2.3.1 System financing

In Ireland the DTSS is funded on an annual basis through the HSE's budget which itself is funded through the Irish government exchequer via the Department of Health with no user co-payments for medical card holders (see section 3.6.1 for more information). This is the same scenario for NHS general dental services for low income ('exempt') patient groups in receipt of various government supports across the UK (with patient co-payments applicable to everyone else) (The King's Fund, 2023). As described in study one, Ireland's other contracted scheme, the DTBS is funded directly by the Irish Government via the Department of Social Protection and a small patient co-payment for periodontal treatment service items (Department of Social Protection, 2023b). As highlighted in section 6.3.3.1 above, a notable manifestation of primary oral healthcare's deprioritisation and marginalisation within the Irish health system in recent history was its reduced funding allocation in the aftermath of the Great Recession when limits were placed on the types and volumes of treatments that dentists could deliver on the DTSS (and the DTBS) to ration care and contain costs. DTSS funding was reduced from €87m in 2009 to €63m in 2010, a reduction of €30m (Burke, 2010; HSE Primary Care Reimbursement Service, 2010). The findings from interviews in study three roundly demonstrate that among GDPs in Ireland, these cuts in spending to the DTSS played a major role in driving practitioners out of the scheme in the long term. The following sentiment from Interviewee 17 summarises the view of all GDPs interviewed in study three and many Irish system interviewees alike:

> *"the fees haven't……medical inflation has been double figures all through my career, like, and the fees have essentially remained stagnant, notwithstanding the last increase. I think the last increase was probably just a desperation measure to try and keep the scheme just operational like that. That was my only, that was my sense of it…. the [austerity] cuts and the fact that we weren't getting even a token annual increase made it, made it very, very difficult to operate a dental practice"- Interviewee 17 (study three - extended dataset)*

GDPs in Ireland reported financial pressure and fear of business uncertainty arising from continued participation in the DTSS both in the immediate aftermath of austerity cuts and more recently with

inflationary pressures and rising business costs. These were primarily felt by GDP principals in the immediate after of budgetary cuts when they perceived the "rug had been pulled" from beneath them, and to this day, especially amid rising practice costs and inflation. Despite improved economic fortunes over the last decade and overall increased state expenditure on health, Ireland continues to underfund primary oral healthcare within the health system with the majority of care being privately financed by individuals and families (Johnston et al., 2020).

In economics theory, the loss of previously paid financial incentives in healthcare can lead to frustration and the subsequent withdrawal of reciprocal cooperation among healthcare professionals in what Fehr and Falk describe as the *'disappointment effect'* (Fehr & Falk, 2002). The sentiments of Irish GDPs above reflect the views and experiences of dentists elsewhere including in the UK and North America, where reimbursement rates on state contracts have long been perceived as suboptimal compared to out-of-pocket private fees and a major barrier to participation, as outlined in study two (Arevalo et al., 2020; Gallagher et al., 2021b; Harris & Holt, 2013). As highlighted already, UK GDPs also perceived that suboptimal reimbursement meant there was a drive to *'cut corners'* which impacted their perceived ability to deliver high quality care (Gallagher et al., 2009; Gallagher et al., 2021b).

Concerns over the financial viability of state care provision are longstanding. As demonstrated by Calnan et al., as far back as the 1990s, GDPs in England have cited government cuts to NHS dentistry, constrained fees and concerns regarding their practices' finances (and ability to deliver high quality care) as major factors influencing the drift towards private dental care (Calnan et al., 2000). Similar to the findings of this thesis, the authors of that study found that this drift was complex and influenced by other factors including regional variability in the oral health 'market', the availability of NHS 'employee' benefits (e.g., access to NHS pensions) and the tension between entrepreneurialism and public services ethos. The same authors' seminal article *'Knights, Knaves and Gnashers'* acts as a theoretical sequel to the former paper. In it they posit that for many GDPs, the shift away from NHS dentistry, towards private care is ultimately driven by both egotistic and altruistic motives working in the same direction. That is, GDPs perceive that by moving from NHS to private care, this not only facilitates complete entrepreneurial control free from state interference, but patient access to clinically autonomous, high-quality practice which they believe serves their patients' best interests (Taylor-Gooby et al., 2000). This professional 'culture' of defining patients' interest in terms of access to clinically autonomous (and restorative driven) practice somewhat reflects the sentiments of GDP interviewees in study three, for example interviewee 4 who said:

> *"It's the fact that they cannot treat patients the same as they might and provide the same level of treatment"*

and

> *"the Irish Dental Association promotes independent practice, and by that [they] mean to have clinical decision making, which is free of third-party interference. It allows you your freedom and so it allows for a better outcome"- Interviewee 4 (study three- extended dataset)*

As outlined in study one, in Ireland, the current provider payment method on both state schemes is fee for service (FFS). *Smile agus Sláinte* proposes remunerating dentists via two new payment approaches as part of system reforms. For children aged 0 to16 years, payments will be made via a 'bundling' model. Bundling or 'episode-of-care payment' is where a single payment is made to a provider based on the expected costs for a collection of services delivered during a single episode of care (Damberg et al., 2014). Children will be eligible for eight 'packages' (bundles) of care, which will include prevention, primary and urgent care to be provided by private GDPs at various time points consistent with dental development milestones. Each 'package' will be regarded as single, standalone episode of care regardless of the volume of treatment delivered or how many appointments are required to complete treatment. For adult medical card holders, a hybrid model will see GDPs remunerated via a blend of bundling and FFS. GDPs will receive a fee for basic packages of primary care, to include prevention and one filling (similar to children) with all other primary care being reimbursed by FFS, for example additional restorations. Comparing provider payment methods, *Smile agus Sláinte* suggests that unlike capitation or FFS, bundling has *"emerged as a mechanism that is suited to maximising efficiencies and effectiveness in general dental practices, especially when providing prevention-oriented oral healthcare services".* As study two demonstrates, in England and Wales, the move from a centrally administered FFS contract to a locally commissioned, target-based 'pay for performance' bundled NHS system in 2006 has proved to be universally unpopular amongst the profession and major factor influencing GDPs' dissatisfaction with NHS dentistry to this day (Brocklehurst et al., 2020; Buckland et al., 2025; House of Commons Committee of Public Accounts, 2025; House of Commons Health and Social Care Committee, 2023). Those changes saw over 400 individual items of service replaced with three (now five) broad treatment categories or 'bands' with GDPs receiving a single payment for delivery of all necessary care within a respective band, regardless of the actual volume of clinical care or appliances provided (similar to packages of care proposed in *Smile agus Sláinte*) (Brocklehurst et al., 2020). The 'currency' or measurement of GDP output in the English system

remains the 'Unit of Dental Activity' (UDA) with each treatment band carrying a different number of target UDAs, for example band 1 equating to one UDA, band '2b' equating to five UDAs and band 3 equalling 12 UDAs (The King's Fund, 2023). Efforts to reform this contract have dogged UK politicians and policymakers from almost as soon as it was implemented in 2006. Indeed, the latest *'NHS 10-year plan'* for England once again commits to reforming the ailing NHS dental contract to one focussed on prevention, despite the failure and wind-down of the long-running dental contract reform (DCR) programme in 2022 (UK Government, 2025).

While in Ireland the reimbursement rates under the proposed new arrangements are not yet known, nor is it proposed that GDPs will bid for state contracts or be bound by annual clinical targets or the threat of payment 'clawback' for underperformance, the experience in the UK, where contract change occurred almost overnight and with no prototyping of new arrangements, demonstrates the impact of abrupt and radical changes to provider payment methods on GDP behaviour and attitudes towards providing care on behalf of the state. There is a need therefore for health systems to engage with the profession on proposed contractual changes or new arrangements prior to their implementation. Incidentally, a 2024 realist evaluation of the NHS GDS Contract Reform Programme in Wales found that when the health system established and maintained good relationships with pilot general dental practices, staff felt supported and reassured which led to increased trust and their sustained engagement in the reform programme (Jones et al., 2024).

6.3.2.3.2 Market dynamics

On the influence of the wider economy and population demand for care, there is evidence across the three PhD studies that these can have a major influence on the primary oral healthcare 'market', GDPs' practising behaviour and willingness to engage in state contracted care. As study one demonstrates, abrupt and deep funding cuts to the DTSS in 2010 did not immediately result in a cliff-edge reduction in scheme participation. To the contrary, HSE PCRS data show that the number of contracts held, and claims submitted on the scheme actually *increased* up to 2016 and 2017 respectively, when Ireland was emerging from many years of economic stagnation and austerity, only declining thereafter. As reported extensively in study three, while this withdrawal of funding in 2010 came as a shock to many GDPs at the time and was a source of much disappointment and loss of trust in the system, the reduction in out-of-pocket spending on private dentistry coupled with an increase in the number of medical card holders appears to have driven a degree of demand-led stability and financial certainty in state financed care. Recounting their time working in general dental practice during the recession in Ireland, one interviewee said:

> *"So you'll do it [the DTSS], and you'll suck it up if you have no other patients coming in the door. So, you know, we would have happily seen medical card patients and been delighted to have the guaranteed money come into the bank when the economy was poor and when there wasn't a lot of private practice business"* – Interviewee 5 (Study three – extended dataset)

It might therefore be theorised that while GDPs were unhappy and felt devalued and let down by the state and health system, the wider economic circumstances meant GDPs had little choice but to engage with or remain in the DTSS, as fewer people could afford to pay out of pocket, thus temporarily damping down or indeed delaying Fehr and Falk's *'disappointment effect'*, certainly with respect to negative reciprocity with the health system (Fehr & Falk, 2002). In the United States, data from the State of Connecticut show that during the recession, rising unemployment and an increase in the number of low income, Medicaid-eligible patients led to a reduction in demand for private dental services and increased dental service utilisation among low-income populations (Beazoglou et al., 2015). During the period 2006-2012, there was an overall increase in Medicaid provider participation rate of 72% however Beazoglou and colleagues noted that this also coincided with an increase in reimbursement rates (contrasting with Ireland). While the authors recognised that it was not possible to completely separate out the effects of both a fee increase *and* the recession, they concluded that because there was a significant reduction in market demand for private dental care (and therefore unused capacity in the system) and because Medicaid reimbursement rates remained below private market prices during this time, it indirectly suggests that dentists viewed the Medicaid participation more positively during this period. More recently a study by Nasseh et al., used 2017 national Medicaid claims data to examine the characteristics of contractors found that dentists in rural areas or in socio-economically disadvantaged areas were more likely to treat a higher number of Medicaid patients (Nasseh et al., 2023). The authors posited that this was because the market in OOP or privately insured dental care was less lucrative in these areas. At a practitioner level, data from the Irish regional secondary data analysis in study one of this PhD point to a higher DTSS participation rate among later career GDPs with 60% of GDPs holding both DTSS and DTBS contracts being qualified 20 years or more compared to 32% of DTBS-only contract holders. While the numbers are too small to be representative of the wider profession or to draw a definitive conclusion as to why we see a difference in participation among these GDPs, two of the three DTSS contractors interviewed in study three were late career, single-handed GDPs working in rural midland and remote coastal communities respectively who both reported a desire to continue serving their public patients owing not only to economic imperative, but a sense of public service duty and personal links with

their local communities. The findings of Goodwin et al., (2018) in their rapid realist review exploring the impact of capitation payments on GDPs' behaviour corroborate this latter finding (Goodwin et al., 2018). Using data from four other studies, they theorised that the influence of GDPs' place of work, social networks and sense of public service ethos can be powerful in shaping their attitudes and intentions towards providing public service dental care. They postulated that GDPs living and working in rural areas maybe more likely to treat friends and neighbours compared to GDPs working in highly urban areas with a high and dynamic turnover of patients. Therefore, for rural GDPs, these close community ties may mean they are less likely to view their patients as 'commodities' that can be exploited for purely financial gain compared to GDPs operating in cities (Goodwin et al., 2018).

More broadly, the findings of study one and three, backed by the literature uncovered in study two point to the influence of increased population disposable income and demand for treatments that might be considered 'non routine' for example cosmetic dentistry and facial aesthetics (for example Botox®) in driving GDPs away from state-funded dental care, especially urban-practising and younger practitioners. Interviewees in study three widely opined that a buoyant and lucrative market in these cosmetic 'treatments' had emerged in Ireland in recent years and that this existed within a wider general primary oral healthcare market that itself was effervescent with a high demand for care. This, they believed, alongside inflationary pressures had displaced capacity within the system for publicly funded care, namely the DTSS, with practices now finding themselves *'so busy they're turning away private patients'* (Interviewee 9, Study three-extended dataset). Mapping this against the secondary data analysis in study one, a reduction in the number of dentists submitting claims and holding contracts on the DTSS can be seen from 2016/2017 onwards suggesting a decreased reliance on state-financed care (a trend which was evident before the COVID-19 pandemic). Indeed, data from the CSO reveals that household out of pocket private expenditure on dental care in Ireland steadily declined from €412 million in 2011 to €307m in 2017, increasing thereafter to a high of €486m in 2023, aligning with the findings of study one (Central Statistics Office, 2024a). When comparing the average private market rates for primary care dentistry and reimbursement rates on the DTSS, it is perhaps unsurprising to see this drift towards the private sector, especially amid such a burgeoning market. A 2022 study by Smith et al. examining the prices of dental services in Ireland determined an average difference in prices between out-of-pocket and DTSS reimbursement rates of between 21% and 97%, for example, the average private fee for 'prophylaxis' was €63 versus €31 on the DTSS (Smith et al., 2022). This was based on 2020 private practice prices and pre-2022 increases in DTSS FFS rates.

Finally, another key factor to emerge from both study two and three is the influence of perceived behaviour of public patients on GDPs' sense of value working as state contractors. Some interviewees in study three reported not only were some medical card patients complex to manage clinically (for example, due to high unmet needs or complex medical or social histories) but from a behavioural perspective, for example displaying violence or aggression towards contractors. Public patients' failure to engage fully or comply with care prescribed by GDPs was something reported in both PhD realist studies and a source of much GDP frustration, sense of debasement and of being taken for granted. According to one former DTSS contractor:

> *"the other thing that kind of frustrated me a lot with the [DTSS] scheme as it was, was the unreliability of patients and the lack of value that patients saw in the scheme themselves. We used to get a lot of missed appointments" – Interviewee 3 (Study three-extended dataset)*

This is mirrored widely elsewhere in the international literature, especially among general dentists signed up to the Medicaid programme in the United States (Mofidi et al., 2002; Reynolds et al., 2019).

The above section highlights the importance of health systems financing and market dynamics in influencing GDP behaviour and engagement in state care. Leaving aside all other factors identified in this thesis, the above factors alone are complex with no easy solutions. The adage of there being 'no new money' in the health system is perhaps one which will continue to make solving the dichotomy of the continued use of costly care models within restrained fiscal envelopes difficult, if not impossible for health system leaders. While DTSS fees have increased and partially narrowed the gap with private fees, they are unlikely to ever fully align. Therefore, as has been highlighted elsewhere, the onus remains on Irish health system leaders and service planners to think differently about how the system is financed and how providers are incentivised in order to maximise their engagement and increase access to care for vulnerable populations. While the ultimate aspiration would be to have system where upstream public health measures are prioritised and resourced in line with the GOHAP, at the downstream level, the system will need to examine how to optimise provider payments so that prevention is fairly incentivised over restorative and interventionist care (Watt, Daly, et al., 2019).

6.3.2.4 Competing institutional logics between private providers and health systems

Similar to financing, governance (along with leadership) is a key WHO building block and one that is regarded as salient in building and strengthening health systems (World Health Organization, 2010a). Governance is described as cross-cutting, closely related to accountability and concerned

with the supply, financing, performance, oversight and evaluation of health services (World Health Organization, 2010a). However, as the findings of this thesis show, when governance and oversight processes within state dental systems are perceived to be overtly bureaucratic, inconsistent or disproportionately punitive in their approach, these can have the unintended effect of driving GDPs away from the public system, towards the private sector. As highlighted in studies one and three, since 2010 the Irish primary oral healthcare system has largely been defined by cost containment. How this has translated into the design, governance and routine operation of state dental schemes is in the tight restriction on types and volumes of care that GDPs can offer their public patients. A notable feature of the DTSS is the prior approval mechanism whereby GDPs can apply to local dental health service managers to have additional treatments covered. Prior approval is a tool adopted in other health systems to prevent overutilisation of services, control spending and promote cost-effective care (Pestaina & Pollitz, 2022). This mechanism was frequently cited by both GDPs and health system actors in study three as being inconsistent and burdensome in its administration for both frontline clinicians and health service managers. GDPs in study three universally reported that these contract restrictions limited their clinical prescription and ability to offer comprehensive care to their medical card patients and therefore threatening their professionalism and relationships with health system management.

The theme of constrained clinical autonomy and control practising within state contracts is by no means unique to Ireland, as the literature in study two consistently demonstrates. There are however some key differences between the experiences of GDPs in Ireland and those elsewhere in how this sense of lost decision-making power manifests, owing to inherent system differences. In the UK literature, GDPs frequently reported rigid 'UDA' clinical targets set by NHS commissioners (and the threat of payment 'clawback') as instrumental in undermining their sense of professionalism, clinical autonomy and business control. This was a major factor contributing to their loss of trust and disengagement with the NHS system. Exploring the impact of the 2006 contract change in England (from FFS with no targets to capped payments with targets) and new governance arrangements on the motivation of GDPs, Harris et al., (2011) said:

> *The change to a system with a greater degree of 'outside' control, was something which was painful, and a reason for some to move away from providing a service within the NHS:*

One GDP quote they used to elucidate this was:

> *"The thing that hurts me the most is the fact that somebody else from outside is telling me what to do with my business. They're telling me which patients to see, how many I've got to see. They're telling me when I've got to see them, when I can take holiday—that just*

> *doesn't appeal.... that's one of the reasons that you go down the private route. I'd rather take slightly less money and be private than have somebody telling me and having to be attached to somebody who doesn't really know the business"* (Harris et al., 2011)

Delving into the theoretical underpinnings of this phenomenon, in their subsequent and comprehensive analysis of the factors influencing GDPs' responses to contracts, Harris et al., (2015) identified a series of competing institutional logics at play at both dental practice and health system levels and the tension arising from these. Among GDPs, they identified a dominant logic concerned with practice ownership responsibility and a sense of ethical responsibility to serve patients' best interests, both of which were entwined, and at times in conflict with, a focus on commerciality and sustaining profitable practice businesses (Harris, Perkins, et al., 2015). Tensions between professional, ethical obligations and financial business concerns have long been recognised as features of independent general dental practice, not just in the UK's health systems, but in the United States (Dharamsi et al., 2007).

Among health system managers (NHS commissioners) three interacting and sometimes competing logics of 'managerialism', 'public goods' and 'bureaucracy' were identified. While population health 'managerialism' and 'public goods' logics focus on maximising the efficiency of NHS expenditure and the equitable provision of resources to the wider population, they were found to conflict with GDPs' 'practice ownership', professional 'clinical care' logics and autonomy. The classic and often cited example of this in the literature is where NHS commissioners instruct practices on how many and which patients to accept (Gallagher et al., 2009; Harris et al., 2011; McDonald et al., 2012b). This contravenes the GDP 'practice ownership' logic, can upset commercial sensitivities (i.e., patients as a source of income) and is an apparent afront to autonomy. The 'bureaucracy' logic, defined by rigid adherence to system rules, regulations and processes influences the extent to which health system managers can exercise their own autonomy, flexibility and innovation in how contracts are administered. While some commissioners openly reported exploiting 'grey areas' and flexing contract rules to enable negotiations with GDPs and persuade them to co-operate on the delivery of health system goals (and therefore improve patient access to services), an 'up focussed', target-driven culture within the NHS meant the decisions of commissioners locally were often overruled by managers 'higher up' the chain of command. This reportedly stifled innovation and represented a source of discomfort among local contract managers and had the potential to damage their relationships with local GDPs.

While the Irish system, namely the DTSS does not appear to be characterised by the same level of hierarchical population health 'managerialism', findings from study three do present some parallels with Harris et al., (2015), especially the 'bureaucracy' logic. With respect to the prior approval function, health system actors and GDP interviewees alike widely reported a perceived lack of clarity ('greyness') on patient eligibility for 'below the line' extended care (especially 'borderline' cases) and an absence of standardisation and accountability within the approval process itself. While some Irish dental managers similarly reported capitalising on these contract 'ambiguities' and exercising maximum flexibility over how patient eligibility or 'vulnerability' is interpreted and reducing as many administrative barriers to approval as possible to maximise GDP engagement in the DTSS, others were reportedly overtly dogmatic and bureaucratic in their approaches. According to one HSE dental manager:

> *"Ok, I think what it is …, people [HSE dental managers] are rules obsessed, okay, right? And they say, if you follow this rule to the letter of the law… I've sat at meetings and people are arguing that refugees are not vulnerable! You know what I mean? They're just, they're like….it's not on "the list"….doesn't say "refugees" on the list, so it's not on "the list". Or if there's a, you know, there's a medical problem, but that medical problem isn't on "the list". So, they're kind of like… "computer says no" …. and so they're following things to the letter of the law. So, is that 17-year-old needing 22 fillings vulnerable? Well, what proof have I got that he's vulnerable? As far as I'm concerned, he's definitely vulnerable, because he has 22 cavities… And, but you know… if it doesn't say it on a form somewhere, that you can tick a box…..whereas I see that we have an autonomy as managers, they're not… they're not asking administrators to make these decisions, they're asking dental clinicians, professionals, to make these decisions, and I feel that I have an autonomy now" – Interviewee 9 (Study three – extended dataset)*

Although health system managers in study three agreed that the key to unlocking a sense of professional autonomy among GDPs (and therefore facilitating their engagement in the DTSS) lay in reducing as many administrative and clinical barriers to the delivery of timely care, there were disagreements on how this might be achieved. Some opined that *more* standardisation and accountability was required in the system and suggested that the prior approval mechanism should be taken out of HSE dental managers' hands and moved centrally within the HSE as a purely administrative function. This sentiment somewhat chimes with those of GDP interviewees who implored the system to become more *'above board'* and *'watertight'*, suggesting many of the DTSS' problems can be traced back to a culture of opportunism and system abuse among GDPs, exploiting contract loopholes and ambiguities for financial gain. Conversely, while it was suggested

that greater education, training and consensus on the prior approval process were required among HSE dental managers, one HSE manager warned that *"we could make things worse by making things more watertight"* (Interviewee 9, Study 3 -extended dataset).

As outlined in study two, prior approval is not unique to the DTSS. Although other health systems using this tool may be more generous in their approval thresholds (for example in Scotland where the NHS GDS prior approval limit is £600)(NHS National Services Scotland, 2025), the issue of associated administrative (paperwork) burden is one that is transcendent in state financed dental services. In the United States, for example, dentists participating in government 'safety net' programmes for low-income populations, namely Medicaid frequently cite 'pre-authorisation' as a source of frustration owing to the volume of documentation required and the amount of time it takes to complete such paperwork (Logan et al., 2015; Reynolds et al., 2019).

Finally, another key aspect of governance and accountability observed in the Irish system in study three was that of quality assurance ('probity'). A comparison with the international literature suggests that the inherent shortcomings in DTSS probity arrangements are somewhat unique to Ireland. These shortcomings were brought to the fore in 2009 with Professor Paul Batchelor's now seminal report on probity assurance in the DTSS which found widespread abuse of the system by GDP-contractors (Oral Care Consulting Ltd, 2009). Although quality assurance *per se* did not arise as a concern elsewhere (in study two), there are some parallels with respect to GDPs' perceptions of system unfairness and punitiveness, for example in England where GDPs frequently reported payment 'clawback' for failure to meet NHS UDA targets as oppressive and unreasonable. This echoes the sentiments of Irish GDPs and health system elites in study three with respect to the HSE's blanket approach to probity assurance where GDPs were asked to *'come clean'* on overclaimed surgical extractions and make self-calculated repayments for allegedly fraudulent claims.

6.3.2.5 The dental profession: influence of culture and networks

An important theme to emerge from this PhD is the influence of dentists' professional networks, representative bodies and wider professional culture within dentistry in shaping professional norms and GDP attitudes towards state funded care and the health system. As studies two and three show, this phenomenon is itself complex, operating at different levels with differing impacts on individual and collective GDP behaviour and their relationship with the health system. Study two highlights how negative messaging from within GDPs' peer networks can reinforce of amplify negative messaging surrounding state funded care. For example, in Gallagher et al., (2009) early career GDPs were seen to draw on the views of peers including more established practitioners and

that stories of previous ill-treatment of the profession by the government negatively influenced their perceptions of the NHS. This was substantiated by Harris et al., (2015) who found that stories (*'shadows of the past'*) including conspiracy theories broadcast from within GDPs' wider networks had the potential to amplify mistrust of the health system. They went on to say that this mistrust can manifest insidiously as disinformation purposely being transmitted through professional networks as rumour, for example false allegations of contract mismanagement or *'dishonest dealings'* with fellow GDPs being levelled at commissioners (Harris, Perkins, et al., 2015). The authors note that the commercially orientated yet isolated nature of dental practices, coupled with the fragmented nature of GDPs' networks and a health system communication vacuum can compound this mistrust. This can have an especially deleterious effect on relationships between NHS providers and health service management. While stories of such rumour and conspiracy were not replicated in Ireland in study three, there are notable similarities with respect to negative reinforcing messaging and fractious negotiations and engagement between professional representatives and the health system with accusations of unilateralism and dishonesty being directed. Citing the Irish revolutionary James Connolly, one interviewee used the phrase *'ruling by fooling'* to describe the way the Department of Health engages with and communicates with the profession on matters such as system change, suggesting a lack of transparency and dishonesty on their part.

Echoing the findings of study two, interviewees in study three reported that owing to its relatively small size there was a propensity for information to travel quickly and for there to be amplification of negative messaging surrounding the HSE within the Irish profession. A notable example being the professions' response to the HSE's failure to deliver PPE in the wake of COVID-19 when it was reported that GDPs resorted to social media to *"encourage one another to say, "to hell with the HSE"'* (Interviewee 3, Study three-extended dataset). More broadly, the emergence of a professional culture in Ireland where state funded primary care, namely the DTSS was perceived as being second rate compared to 'independent' private practice free from external (state) influence was also reported. According to Interviewee 17:

> *"there's so much negativity and lack of trust like, you know, and there's a groupthink around that like, that…. "you're the smart guy now that you're not doing this [the DTSS]", you know, it's kind of confirmation bias …"- Interviewee 17 (Study three- extended dataset)*

This finding regarding the denigration or stigmatisation of state funded primary care was replicated in the international literature in study two, for example in the United States, where a 2015 study by Logan et al., found that there was a perceived social stigma associated with being a Medicaid

participant among dentists there (Logan et al., 2015). There were concerns raised that messaging such as the one above reportedly being actively promoted by influential figures within the profession, coupled with a strong population demand for cosmetic dentistry and facial aesthetics had the potential to legitimise and encourage dis- or non-engagement in state dental schemes, especially among early career dentists. The emergence of dental bodies corporate in Ireland was also viewed as driving a profit-focussed, 'marketing' culture in non-routine and cosmetic dentistry in Ireland. A note-worthy system difference between Ireland and the UK is that of an absence of state-supported system mentorship in Ireland. While the UK literature showed that participation in state-contracted primary dental care was perceived as beneficial for early career GDPs and where most new graduates undertake a mentored 12-month Dental Foundation (DFT) or Vocational Training (DVT) year in general dental practice (Committee of Postgraduate Dental Deans and Directors (COPDEND) UK, 2015), no such opportunity exists in Ireland anymore* *(*a voluntary vocational training scheme existed in Ireland until 2011)* (Irish Dental Association, 2023c). The absence of DFT/DVT in Ireland was viewed as serious system shortcoming and a missed opportunity to engender a sense of public service ethos among early career dentists. While there are no explicit proposals to reintroduce DFT or DVT in Ireland, *Smile agus Sláinte* does recommend the establishment of *"lifelong postgraduate mentoring and supervisory networks for dentists to support their professional career"* and *"placing an academic focus on primary oral healthcare in dental schools"* to support dentists and prepare them for the requirements of primary care dentistry service delivery (Department of Health, 2019). On education, Ireland's first community based dental education (CBDE) undergraduate programme will commence in September 2025 which will see students trained in a primary care environment (Royal College of Surgeons in Ireland, 2025). As a pedagogical approach, CBDE has been credited with facilitating the smooth transition to independent primary care practice and encouraging undergraduates to consider careers in public sector dentistry (Leavy & Daly, 2025).

6.3.2.6 Mistrust between the state and privately practising dentists

On oral health governance, strategic objective number one of the WHO global oral health action plan is to *"improve political and resource commitments to oral health, strengthen leadership and create win–win partnerships within and outside of the health sector"*(World Health Organization, 2024). Crucially, on the latter point it asks member states to *"forge strategic partnerships for oral health"* by engaging with, among others, oral health professionals including the private sector to *"implement policies, mobilize resources, and accelerate required reforms"* to drive UHC for oral health (World Health Organization, 2024). As Ireland looks to accelerate system reforms congruent with the GOHAP and *Smile agus Sláinte* - National Oral Health Policy, this PhD

demonstrates that the perceived absence of meaningful engagement, collaboration and effective communication between the health system and GDPs poses a major threat to such reforms. The emergence of a culture defined by mistrust and adversarialism appears to have percolated through all layers of the Irish oral healthcare system, from the highest level down to chairside, with the ultimate outcome being GDPs' reluctance or unwillingness to engage with the state oral healthcare system. These challenges are not unique to Ireland however, as the international literature in study two and elsewhere demonstrates.

In study two, abrupt contractual changes implemented with limited or no consensus with the frontline profession were shown to trigger perceptions of powerlessness and mistrust of the health system, especially among practice owners, leading to demotivation and disengagement with state financed care. A notable example of this was in England where accusations of failing to pilot new contractual arrangements have long been levelled at health system leaders following the introduction of the unpopular 2006 NHS GDS contract there (Steele et al., 2009). The cited reason for the lack of piloting was an absence of enabling legislation at the time (UK Government, 2005). Following the recommendations of the UK Steele Review into NHS dentistry in 2009, the UK Government commenced the Dental Contract Reform (DCR) programme in 2011 with prototyping of new contracts taking place across more than 100 general dental practices (Steele et al., 2009). Despite reports of GDPs spending more time on prevention and positive perceptions of the contract, the DCR programme ceased in 2022 as it was deemed not to have improved population oral health outcomes (namely prevention of caries and periodontal disease) nor did it increase access to dental care for NHS patients (Addison, 2021; Department of Health and Social Care, 2023). Somewhat replicating the response to the 2006 contract, GDPs reported feeling *"let down by the abrupt ending of the prototype pilot process"* with the Association of Dental Groups (ADG) describing the 10 years of the DCR programme as a *"lost decade for NHS dentistry"* (House of Commons Health and Social Care Committee, 2023). This sense of collective powerlessness and disappointment was somewhat replicated in 2016 in France when a collapse in negotiations between professional representatives and the French government on the regulation of general dental services and prices resulted in an *"Arbitrary Judgement"* being made by a mediator which drove through unpopular system changes. This judgement was negatively received by the French dental profession who decried they were *"hostage to a potentially punitive decision"* and generated significant tensions between dentists and the government there (Mazevet et al., 2018).

The findings in the two Irish-focussed studies in this thesis (studies one and three) substantiate the international experience. GDP interviewees and system elites alike recognised the impact of sudden and unilateral changes to state contracts imposed by the HSE in response to government

policy and austerity measures in 2010 (outlined in study one). In addition to financial uncertainty and anxiety, GDPs (especially practice principals) reported a sense of shock at the pace at which cuts occurred in Ireland and deep feelings of powerlessness, loss of trust, lack of worth and abandonment by the state. Feelings that run deep to this day. On *Smile agus Sláinte* (2019), there were reports of a lack of meaningful engagement and consensus building on proposed system reforms, with few GDPs expressing enthusiasm for signing up to any new contractual arrangements, for example on delivery of paediatric packages of care. These findings corroborate those of McAuliffe et al on the perceived failure of policymakers to engage with all stakeholders, for example dental representatives and the HSE during *Smile agus Sláinte 's* development (McAuliffe et al., 2022). More widely, GDPs and system elites consistently reported the absence of both informal and formal consultative mechanisms or effective communication channels between the health system and GDPs which only serves to reinforce a sense of being excluded from the decision-making process and isolation within the system. As a caveat, it is important to state that while meaningful engagement with frontline healthcare professionals is recognised as key in engendering a sense of shared decision-making, 'buy-in' and informing successful system reform, there is an onus on all stakeholders to show interest in, and engage with these conversations themselves (Norris et al., 2017). This was raised by health system actors in study three who posited that some GDPs, while unhappy with the Irish system, were unwilling to join in on conversations around system reform or service delivery and that their readiness to engage on system reform would be key to *Smile agus Sláinte 's* successful implementation. One health system official said:

> *"I would like to engage the profession and say, if you take a contract or not, it's neither here nor there, but if we're developing standards and guidelines, you need to be in. You need to be looking at it, engaging with it, because anything that goes in as a standard or a policy has the potential to change your practice, because it will change what patients expect. So they need to be involved and they need to engage, and a lot of them aren't. They're assuming that somebody else is going to do it, and then they bitch and moan when they're told that's not....or what you're doing now is considered to be very much out of kilter. So it's something that they need to be involved in and trying to engage them... that is going to be incredibly difficult" – Interviewee10 (Study three – extended dataset)*

This sentiment among Irish health system officials partly reflects those of NHS contract managers in England as outlined in study two where discordant logics meant some commissioners struggled to engage constructively with GDPs on the direction of travel of services and commissioning

arrangements (Harris, Perkins, et al., 2015). In that study the following quote was used to evidence this:

> *"I want to understand why I can't get dentists, some dentists, to change their bloody mind-set. The game of 'I'm a dentist, end of story' went years ago. You are a health-care professional with a specialisation in dentistry. I'd like to be able to turn around and say 'Sarah comes in for a check-up, smoking cessation, I want you to deliver health checks, I want you to think outside of that bloody box for once and for all, but do not expect to get hundreds of millions of pounds cos I ain't got it. Come in from the cold, don't stay where you are' and again, trust. They don't trust us"* (Harris et al., 2015)

Finally, that last sentence is significant as it echoes precisely the opinions and experiences of both GDPs and health system elites in Ireland in study three. Trust, or more precisely *mistrust* is a theme which appears frequently throughout the international literature and realist interviews. It is a both a pivotal driver of and reinforcing agent for the apparent disconnect between GDPs and the health system and much of the negative discourse surrounding state funded dental care and policy reform. Although many of the aforementioned factors outlined previously feed into GDPs' collective mistrust, it is the perceived manner in which public oral healthcare systems drive through contractual changes without meaningful consensus or operate state contracts in a manner which is interpreted as unfair, dictatorial or punitive that fuels suspicion and transcends both study two and three of this PhD. As highlighted previously in studies two and three the influence of GDPs' wider professional networks including professional representatives in amplifying negative messaging surrounding state contracted care and reinforcing the disconnect can be seen. Where negotiations between professional representatives and the state are perceived as opaque, becoming fractious, this can lead to deepening entrenchment and polarisation of positions and ultimately the loss of effective dialogue and consensus building. When filtered down to the wider profession, this can further amplify perceptions of mistreatment and fuel further suspicion and mistrust in the public system. A resulting culture or adversarialism poses a significant challenge for health systems in their quest to forge strategic partnerships, build and capitalise on 'win-wins'.

6.3.2.7 Declining GDP participation and patient access

Lastly, and central to each of the three studies in this PhD thesis is the issue of declining numbers of private GDPs voluntarily participating in state contracted dental care, specifically for low-income adult populations, as is the case in Ireland. This decline comes amid greater population oral healthcare needs and policy intent to meet that need. While national and international policy and strategy highlight a range of measures that will be needed to achieve UHC for oral health, for

example upstream dental public health interventions and greater use of role delegation within and out-with dental teams, dentists will remain a keystone of primary oral healthcare service provision in Ireland and elsewhere into the future (Department of Health, 2019; World Health Organization, 2024). Without a sufficient supply of dentists supported to deliver state-funded care, the full potential and realisation of such policies and strategies remains in question.

As outlined in study one, Ireland has witnessed a marked reduction in the number of dentists engaging in HSE-contracted care for low-income adults since 2016 with a 50% decrease in the number of DTSS contracts held to 2023 and a 36% decrease in the number of practitioners actively providing care on that scheme to 2022. This is despite an increase in the number of dentists licensed and estimated to be practicing in the country in recent years (Department of Health, 2025) and contrary to an increase in the number of GDPs holding DTBS contracts for the provision of care to insured adults. More importantly is the corresponding change in the number of patients treated on the DTSS, declining some 40% since 2014, while the eligible patient population, with greater needs, has increased. This not only represents a significant dental public health challenge as vulnerable populations struggle to access care, leading to widening oral health inequities, but a potential and significant roadblock to achieving UHC for oral health commensurate with both national policy and WHO obligations. This challenge however is not unique to Ireland or primary care dentistry.

In each of the nations of the UK for example, the shift towards private dentistry among GDP contractors and subsequent difficulties faced by patients attempting to access NHS primary dental care has long garnered the attention of parliamentarians, media outlets, academics and wider society (Silvester et al., 2000). However, the problem has been notably acute in the years following the COVID-19 pandemic, mirroring the Irish experience, albeit impacting a much wider population. In England, where the current NHS GDS contract has proved unpopular with GDPs since its introduction in 2006 (House of Commons Health and Social Care Committee, 2023), access to dental care was severely impacted by the curtailment of services subsequent to COVID-19 restrictions which saw the proportion of adults seen by NHS dentists fall from almost 50% in the two years prior to March 2020 to just over a third (34%) in the following two years to March 2022 (House of Commons Committee of Public Accounts, 2025). Despite an increase in the proportion of adults treated to 40% by March 2024, access to NHS dentistry remains below pre–pandemic levels in England. According to the UK National Audit Office (NAO) in 2023–2024 there were just over 24,000 dentists providing some level of NHS dentistry in England, which represents a decline of 2% (n = 483) compared to 2019–2020 (National Audit Office (NAO), 2024). Similarly, while the number of courses of dental treatment delivered in England partially rebounded following

a steep decline in the wake of COVID-19, the level of clinical activity has yet to return to pre-pandemic levels with 4.7 million fewer courses of treatment completed in 2023-2024 compared to 2019-2020 (National Audit Office (NAO), 2024).

In an attempt to bolster the number of GDPs engaged in the NHS, reforms to the English GDS contract were made in 2022 including the introduction of a minimum UDA bundled care value of £23 and three new payment bands for different treatment complexities (House of Commons Committee of Public Accounts, 2025). While no formal evaluation of the impact of these reforms has been carried out, the GDS contract remains largely unchanged, patient access to care remains a challenge and vacancy rates within NHS dentistry remain high (House of Commons Committee of Public Accounts, 2025). Mirroring this, the secondary data analysis component of this thesis demonstrated that while there was an uptick in clinical activity following an increase in DTSS fees and the re-introduction of the 'scale and polish' item of service for all patients (also in 2022), the number of contracts held has continued to decline in Ireland and access to care remains restricted for many medical card holders.

Elsewhere across the UK, the volume of NHS treatments delivered by GDPs in recent years has decreased, most notably in Scotland and Northern Ireland where, like England, levels of NHS GDS activity have yet to return to pre-pandemic levels (NHS Digital, 2020, 2024). In Northern Ireland in 2022-2023, dentists reported apportioning just under 63% of their time to NHS dental care, compared to just under 73% in 2020-2021, while in Scotland the same figures were 68.6% and 78.2% respectively (NHS Digital, 2020, 2024). In 2023, the percentage of the population registered with an NHS dentist in Northern Ireland was 70%, however recent figures shows that this has declined to 54% in 2025 (Northern Ireland Statistics and Research Agency, 2025). According to a recent BBC NI Health Unit report, more than 53,000 NHS patients have been removed from practice lists by GDPs in Northern Ireland over the past two years and 114 GDPs have resigned their NHS contracts in favour of wholly private practice (BBC NI Health Unit, 2025).

A key aspect of dental recruitment and retention frequently highlighted in the literature as one exacerbating access challenges and inequalities, is that of disparities in the distribution and availability of dentists, especially in remote, rural and coastal areas (Winkelmann, Gómez Rossi, et al., 2022). Across much of Europe, there is a disproportionate concentration of dentists in urban areas, for example in Spain where a third of dentists work in the cities of Madrid and Barcelona, which collectively account for 20% of the population (Winkelmann, Gómez Rossi, et al., 2022). In this thesis the difference in state funded care provision across two distinct geographical areas in Ireland, one of which includes rural and western seaboard counties highlighted in *Smile agus*

Sláinte as lacking in sufficient dental workforce capacity, was explored. In contrast to England, where rural and coastal areas have consistently suffered from NHS dental workforce shortages (D. Evans et al., 2023), the secondary data analysis in this thesis found no difference in the ratio of DTSS contracts per 1000 eligible population between the two selected Irish regions. Furthermore, the recent UK NAO report cited widespread disparities in the levels of NHS dental care treatment provision across England, for example in coastal Somerset in the south west, GDPs delivered 382 courses of NHS treatment per 1,000 population versus 800 courses per 1,000 in South Yorkshire in 2023-2024 (National Audit Office (NAO), 2024). Conversely, the number of DTSS treatment items claimed for in the West/North West HSE region in Ireland in August 2023 was 13,000 compared to 9,000 in the Dublin and Midlands region, somewhat representing an inverse of the English experience (HSE Primary Care Reimbursement Service, 2023b). Additionally, the compounding effect of an aging dental workforce on supply and care provision has, and is anticipated to become, a problem for many European health systems, for example France and Germany where the average age of dentists is 48 (Winkelmann, Gómez Rossi, et al., 2022). Echoing this, study one of this thesis demonstrates that DTSS contract holders in Ireland are on average qualified longer (greater than 20 years) and are therefore likely to be older than non-DTSS providers and are more likely to be male. While the data suggests that the number of registered and practising dentists in Ireland and the number engaged in Ireland's other contracted scheme – the DTBS, are increasing, an aging DTSS workforce presents a significant challenge for health system leaders and workforce planners in Ireland. Engaging early career and urban-practising GDPs in HSE-contracted care will be key in addressing some of the challenges outlined already in both the medium and long term, and in driving the successful implementation of the NOHP.

6.3.3 Integrated findings

The full set of this PhD thesis' findings have been assimilated into a single consolidated model as shown in figure 25 below.

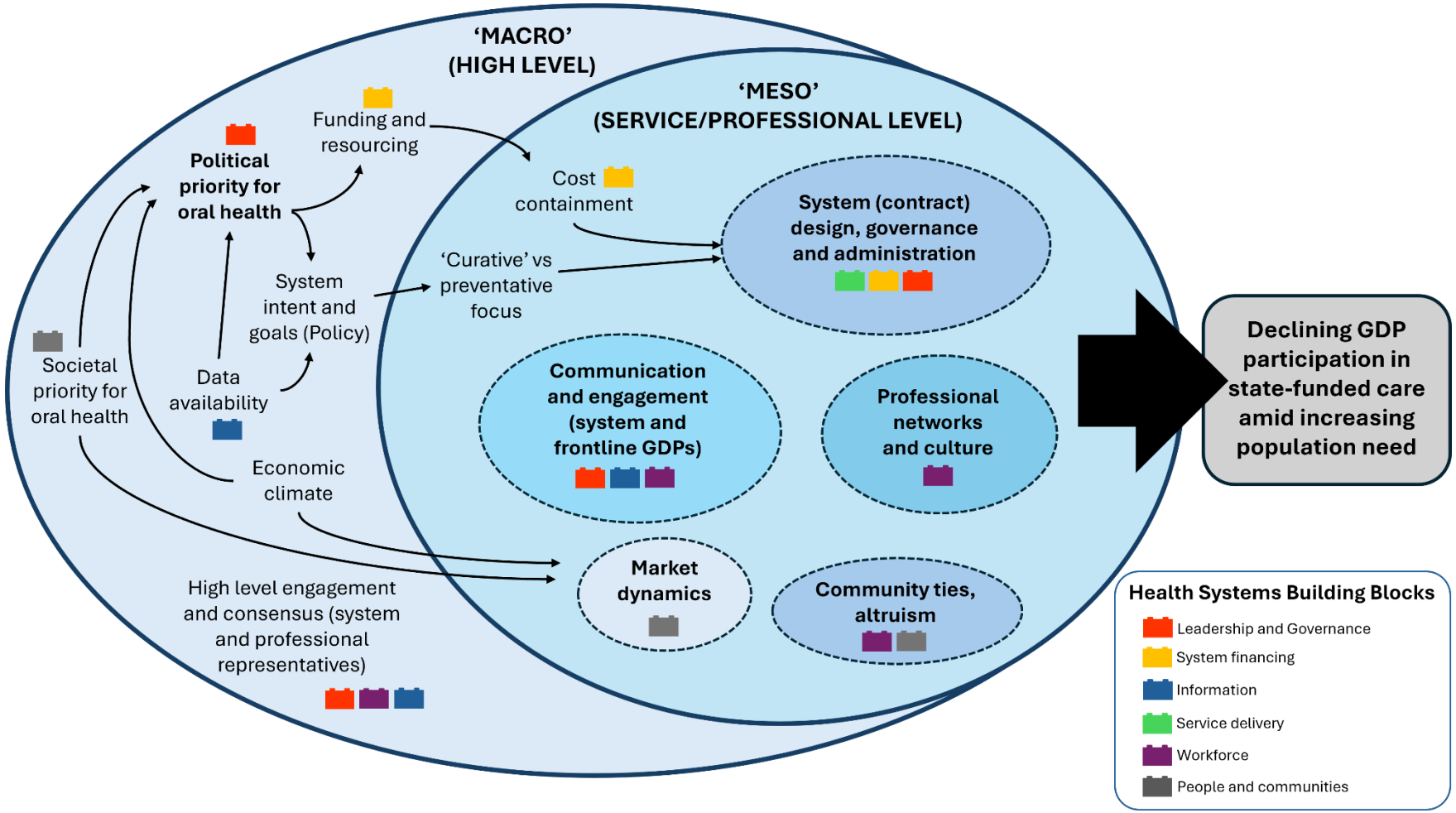


Figure 25: Integrated PhD findings with linked health system building blocks

The model draws upon the findings of the three PhD studies and combines them into one overarching schematic. It conceptualises and presents the various health system factors on two 'levels' summarising how these influence private GDPs engagement in state-contracted care. These factors are grouped and themed in alignment with the integrated discussion above and mapped to WHO health system building blocks (including people/communities which emerged as a powerful driver). Broadly speaking, at the 'macro' level, the focus is on high level political, health systems and economic factors at play and at the mid or 'meso' level this relates to service levels factors, including contracts and their governance, as well as the influence of the wider profession and the private dental market.

At the highest (macro) level, political and health systems priority for oral health was uncovered as a keystone factor shaping oral health policy and system intent, funding, resourcing and design of state-funded primary oral healthcare services and was one on which multiple other factors were predicted. The absence of political priority and commitment to oral health is not unique to Ireland as demonstrated across the international literature and high level WHO documents. Shaping political priority are other high-level factors exogenous to but intrinsically linked to health systems including perceived societal priority (or *non-priority*) for routine oral health. The documentary analysis demonstrated how in 'good times', political will and policy (driven by availability of contemporaneous epidemiological data) can drive positive system change as happened in Ireland in the mid-1990s with the opening of a policy 'window' and the publication of the Dental Health Action Plan and the development of the DTSS. Across both Ireland-focussed studies in this thesis, shortcomings in Ireland's oral health data intelligence were roundly demonstrated. Another key macro-level factor influencing the prioritisation of oral health and the wider market is the prevailing economic conditions as was extensively demonstrated in Ireland in the wake of the 2008 recession when this sector was disproportionately deprioritised and defunded and more recently with economic recovery where increased household incomes are driving high demand for care.

At the mid or 'meso' level, we see that in Ireland and elsewhere health systems continue to design care models and contracts around costly restorative treatments over prevention but simultaneously instigate cost containment measures which can impede clinician autonomy and lead to perceptions of system unfairness and declining trust among GDPs. As the two realist analyses show, these models may be at odds with GDPs own professional values and remuneration perceived as suboptimal when compared to out-of-pocket private market rates. Amid diverse and effervescent private markets in non-routine dental care driven by high population demand, this can displace capacity for publicly funded care as dentists migrate towards this

sector in which they anticipate there being greater reward and value for services delivered and greater clinical and business autonomy.

The realist studies further highlight the importance of communication and engagement between health systems and GDPs. When these are minimal or perceived as confrontational, this can damage relationships between system actors and GDPs and deepen their sense of isolation and powerlessness. Other actors within GDPs' immediate and wider professional networks can be instrumental in broadcasting and amplifying negative and reinforcing messaging around state care and the health system and can further damage relationships and deepen loss of trust. Professional networks can also play a key role in promoting non-routine, private care, free of external influence.

As demonstrated by the data in study one, the above contextual factors have been instrumental in driving a steady decline in the number of GDPs holding and submitting claims on the dental treatment services scheme for low-income adults in Ireland. Concurrently, the proportion of adult medical card holders with greater oral healthcare needs has increased, widening the gap between service demand and capacity.

6.4 Strengths and Limitations

6.4.1 Strengths

The research presented in this PhD thesis comes with a number of strengths and limitations. These are mostly specific and applicable to each of the three studies and as such, have been outlined in chapters three, four and five respectively. In addition to these, there are several overarching thesis strengths and limitations which will now be outlined. The first of these all-encompassing strengths is that, to my knowledge, this is the first primary research study examining the topic of dentists' participation in state funded contracted primary oral healthcare schemes in Ireland. This PhD research is also one of relatively few conducted using a largely realist methodological approach to examine and understand health system dynamics (although their use is growing among researchers in Ireland). This PhD research is also among the few carried out with an oral health systems focus or policy slant either in the Irish or international context. As highlighted by Benzian et al., in order to push oral health up the global health agenda, there is a need for more oral health systems and policy research therefore this work advances this cause (Benzian et al., 2011). As such, this research adds to both a very shallow pool of evidence relating to oral health systems in Ireland while at the same time adding to a what is already known about private GDPs' engagement and participation in state contracted primary oral healthcare globally by adding causal explanations relating to how and why health system level factors influence this.

Additionally, this is the first predominantly realist-focussed body of research examining dentists' engagement in publicly funded primary oral healthcare services from a health systems perspective. As far as I am aware, studies two and three are now among only three realist studies that have examined any aspect of primary care dentists' recruitment, retention or employment with public-funded systems in general. As such, it adds to, and indeed expands on the only other identified study that has explored dentists' engagement in publicly funded primary care utilising a realist approach by Goodwin et al (2018). Theirs was a rapid realist review examining the influence of capitation payments on dentists' behaviour (Goodwin et al., 2018). This thesis also adds to a growing body of realist literature which have explored complex areas of inquiry through a health systems 'lens' (Prashanth et al., 2014).

Lastly, the realist review and interview study presented above were conducted with the consultation of expert stakeholders who were external to the actual PhD studies themselves. For both studies, I convened expert project advisory panels which included members of the frontline dental profession in Ireland, civil servants working in Ireland's Department of Health (oral health unit), Irish Dental Association and patient and public representatives who had experience accessing the DTSS. In both instances, the expert groups proved extremely useful in confirming, refuting and refining the studies' findings and enhancing this PhD research.

6.4.2 Limitations

6.4.2.1 Patient and public engagement

One shortcoming of this PhD thesis is the absence of patients or members of the public as research participants, specifically medical card holders (DTSS eligible patients) in study three. From the outset, this PhD sought to focus on health system level factors influencing private GDPs' participation in state-contracted care therefore it was deemed essential to engage with members of the frontline dental profession and the health system to address the research aim. Interviewing a range of actors within Ireland's oral health ecosystem provided rich contextual and mechanistic data which informed the development of realist programme theory however this meant that the insights gained were solely from those delivering care or in positions of authority within the health system to the exclusion of those who use or will use contracted oral healthcare services, including vulnerable populations disproportionally impacted by oral diseases. As Ireland looks to reform primary oral healthcare in order to widen access to timely and equitable care, ensuring the voices of individuals and families who will use services are heard should be a key imperative when designing services around their needs (Arora et al., 2021; Ramji et al., 2020). Although their perspectives were not directly accounted for in the main body of this research, the patient voice was heard on both the project advisory stakeholder groups for studies two and three where their

insights informed the sense-checking of emerging realist theory. Likewise, within study two (the realist review), the literature uncovered was found to be dominated by dentists and their perspectives, rather than patients (or indeed the health system).

6.4.2.2 Data availability

Studies one and two of this PhD thesis used secondary data, peer reviewed and grey literature respectively to inform their findings. As such, and in common with studies which adopt similar approaches, the findings are reliant upon the availability and quality of such data. As highlighted in section 3.7.5, the absence of contemporaneous and complete data on Irish GDPs presented difficulties in fully appraising the workforce, including the characteristics of wholly private GDPs and practices. Furthermore, there were no datasets available pertaining to individual GDP's actual level of engagement in state dental schemes or the constitution of their respective dental teams. While HSE PCRS data used in study one did allow for an assessment of service utilisation trends among DTSS eligible populations nationally and highlighted the widening gap between medical card holders eligible for and those actually receiving care, there remains a dearth of data on levels of unmet oral healthcare needs in Ireland. These shortcomings in oral health data have long been recognised, for example by the WHO and dental public health academic community globally (McAuliffe et al., 2025; Peres et al., 2019; Watt, Daly, et al., 2019; Winkelmann, Gómez Rossi, et al., 2022).

Finally, another limitation of note relates to the availability of high-level health systems contextual and mechanistic data within the literature in study two. As previously outlined, much of the data uncovered within the published literature pertained to dentists' own perspectives of contracted care or contract level factors influencing their engagement with few studies reporting on the health systems perspective. This posed a challenge when it came to abstracting findings to a higher systems level and therefore necessitated supplementary searches of health systems specific literature to inform the development of realist theory in order to address the research aim.

6.5 Reflexivity

6.5.1 My background and career

I came to this PhD with privilege and biases. In the interest of transparency, it is important for me to reflect on my background, life and career experiences and how these have may have shaped this PhD research. I consider myself to be a white, male, dentist who was raised in a middle-class Irish family where, as children and young adults, we were well provided for including in healthcare and in education. My father was a local pharmacist and business owner, and my mother was a secondary school teacher-turned-full time housewife. I come from a family of healthcare

professionals including dentists. Although I grew up in a rural, disadvantaged border community in County Monaghan, I have no lived experience of the challenges faced by vast swathes of the population who struggle to access timely and affordable oral healthcare. For the majority of my career however, I have worked with vulnerable and deprived populations, for example in inner city Dundee, the remote Orkney Islands and former industrial heartlands of West and South Yorkshire. I have not only gained deep insights into the social challenges faced by, and the disproportionate impact of unmet oral health needs on these populations, but I have gained great satisfaction caring for these communities. Some of the happiest and most rewarding days of my career to date were spent working in these communities (especially in the Community Dental Service in Mid Yorkshire) and I have no doubt these experiences have fuelled my interest in dental public health, health inequalities and health systems reform.

I consider myself to be very fortunate that my parents had the foresight and means to send me to Scotland to study dentistry and since then, I have always sought to advance my skills by working in a range of clinical and non-clinical oral healthcare settings and seizing on educational opportunities when they arise, for example this PhD. As a dentist in the Irish oral healthcare system, I wear many 'hats'. Although I no longer work in state-funded primary dental care, I maintain a part time clinical role as a senior dentist working in an out-of-hours urgent care service for a major health insurance provider wherein I still bear witness to populations with significant unmet oral healthcare needs, including young children. Beyond the clinic, I am an elected member of council of the Dental Council of Ireland sitting on multiple committees and for the past five years I have been in involved in the teaching of undergraduate dental students, which I have found thoroughly fulfilling.

Although I previously worked as a GDP-contractor in Scotland's NHS GDS for a period of two years, the majority of my career has been spent in salaried dental services, both in the UK and Ireland. I have no experience practising within either of Ireland's two contracted schemes — the DTSS or DTBS. Coming into this PhD without this experience has meant that at times throughout the last four years, I have felt like I lack 'lived' experience working in the Irish system and therefore perhaps I cannot relate entirely to the problem under investigation in this thesis. I have often heard frontline practitioners decry dental academics or researchers for sitting in their 'ivory towers', by that they mean being detached from the realities of everyday clinical practice and its challenges. Throughout this PhD journey, a concern I have had is that I lack credibility as a clinician-researcher, in particular, when reaching out to, and interviewing frontline private GDPs. I have questioned whether or not I am best placed to research this topic and have wondered do my peers perceive me as someone sitting in an 'ivory tower' too? Indeed, at times I questioned whether I should take

on an associate role in general dental practice one day per week to experience what it is like to provide care under Ireland's dental schemes. However, I like to think that by maintaining a part time clinical role providing urgent dental care, I have maintained some level of credibility as an Irish clinician-researcher even though that role lies outside the public dental system. Cognisant of capacity pressures and my mental well-being, throughout this PhD Dr. Sara Burke would understandably question my continued commitment to that role to which I would push back not only because the cost of living in Ireland (and high mortgage repayments) means I have had to supplement my household income, but because I still want to 'keep my hand in' clinical practice and 'keep it real'. Notwithstanding this, I was, for the most part, entirely reliant upon third party information in the form of literature and spoken word when learning about contracted care within the Irish primary oral healthcare system.

6.5.2 Biases

The last observation above is key in how I perceive in my biases have been shaped — biases which have been informed not only by who I am combined with my own experiences working in public healthcare systems, but crucially, the opinions and experiences of other dentists, including colleagues, close friends and family. As outlined in both realist studies of this PhD, the influence of dentists' wider professional networks of friends, colleagues and representatives can be extremely powerful in seeding, reinforcing and amplifying negative messages and perceptions of the 'state' system. As I have said to Dr. John Ford on multiple occasions when discussing emerging realist findings, my perception is that there is something akin to intergenerational collective professional trauma within dentistry where age-old tales of state mistreatment have been passed down through generations of practitioners. Even now, as I come to the end of my PhD, I still find I can very easily drift into 'negative thinking' territory and I find myself doing this, to some extent, in my part time clinical role. These biases infiltrated into my PhD study findings, certainly in the early phases of these workstreams when my CMOCs would be overtly orientated towards the perspectives of the dentists (or as Dr. Sara Burke would say, the *"woe is me"* dentists). Laterally, even as my realist interview study findings were emerging and despite my best efforts, I still found it all too easy to slip into the mindset of dentists as victims and viewing what is a complex problem from a purely one-sided perspective. As my 'non-dental' supervisors, Dr. Sara Burke and Dr. John Ford would still challenge me to think about the health systems' perspective and to try and understand why certain factors would impact or influence upon system decision making. As highlighted in section 6.4.2 above, both the literature unearthed in study two and interviews in study three were dominated by dentists and their perspectives rather than the health system or patients. This is both a weakness of this research but also reflective of the wider profession of which I am a member and perhaps a

reinforcing agent of my own biases and opinions. I am extremely grateful therefore to my supervisors for their ability to consistently challenge me on these aspects in a way which was supportive and encouraging and never disparaging or infantilising.

6.5.3 Research reflexivity

With regards to research reflexivity, I have done several things during the process of conducing the three studies presented above to reflect on the research process itself and to minimise any risk of bias. I undertook expert training in the methods used (realist approaches) and have sought expert supervision through each step of the research process, carefully sense-checking my emerging findings. I have also involved external experts in both of my realist studies as the approach allows for as an integral part of the realist research process. With regards to data collection, I undertook extensive reading and online training on realist interview technique to enable myself to conduct the best interviews possible. When conducting my interviews, I undertook pilot interviews to test out my questions and get feedback on my technique. Something Dr. Sara Burke was keen to impress upon me was the importance of recording notes and reflections throughout this PhD. I will put my hands up and declare that while I wasn't as diligent in this regard as I could have been, I did carefully record reflections after each interview in study three and reflected on how I had presented myself and my theories and the interactions with participants (I will expand on these below).

One thing I was so keen to do from the very start of this PhD was engage with as many actors in the Irish oral healthcare system as possible, including those working in the Department of Health and HSE. This engagement was not only in terms of participation in the studies as subjects but engaging them as stakeholders in both realist studies' expert groups. I also made a point of reaching out to officials within the Department of Health from the outset of this PhD. I felt it was important that health system decision-makers were aware of this research, and I wanted this publicly funded PhD to be conducted in the spirit of collaboration and full transparency, for the public good. Getting multiple system stakeholders around the table as part of both realist study project advisory groups was something I was initially nervous about – especially frontline GDPs with Irish Dental Association experience and Department of Health civil servants. I feared the possibility of difficult interactions between these two (often opposing) 'sides' of the Irish oral healthcare system. In the end, this experience proved to be cathartic for me. These interactions were extremely cordial and productive with a sense of open dialogue, respect towards each other's positions and ultimately shared decision making on my emerging CMOCs. I feel proud that I did this as part of my PhD and for the relationships I have built through this process. I can say with some

certainty that thanks to this PhD and the connections I now have, I feel less of an 'outsider' in the Irish oral healthcare system now than I did at the start.

On interviewing health system actors as part of study three, I feel these experiences have really given me an appreciation for the challenges health system leaders and managers experience in planning, resourcing and running oral healthcare services. I am forever grateful to these interviewees for their enthusiastic willingness to take part and their unabashed and unrestrained honesty in 'telling all'. As outlined earlier, I kept a diary of my reflections after these interviews, and I would like to share two of these which I feel epitomise interviewees' honesty and my gratitude:

Interview with Interviewee 3 (29 November 2024)

> *"I came away from this interview feeling very enthused and knowledgeable. It was a phone interview, so maybe that allowed the participant to open up more? Participant wanted to talk and stayed on longer than scheduled time! Great insights given into system dysfunction, very raw, very honest interview and perspectives of the DTSS from someone heavily involved with the scheme at system level! Gave great stories of times gone past, the changes that took place in 2005 when HSE was formed and the effect this had on local/regional decision making and collaboration. Good insights into lack of direction of DTSS – the system doesn't know what it wants it to be.! This was the most enjoyable interview. I felt very relaxed during this, it was little effort for me. I suggested contacting this interviewee again for follow up."*

and

Interview with Interviewee 9 (17 December 2024)

> *"Great interview, possibly the best so far. This interviewee held nothing back and gave me real, honest insights from a HSE contract/operations perspective. I feel this interview was rich in data and corroborated data from other interviews. It was an unfiltered interview. I felt really invigorated after this!"*

I remember when planning this PhD thinking it might be a challenge to recruit to health system elites in Ireland however this proved to not be the case. In fact, what I found was, they were all too willing to engage with this research, which Dr. Sara Burke told me wasn't uncommon in health services research, with many of them perhaps seizing the opportunity as a form of 'therapy'? Oddly, I found the reverse was true for GDPs. I thought this cohort would be lining up to share their views but I fact, the opposite was the case, and I actually found this cohort hard to pin down. Reflecting the findings of this thesis, this is most likely due to how busy they are in practice but an

interesting observation from a senior health system interviewee (when I mentioned this) was that this was perhaps symptomatic of their reluctance to engage in conversations around contentious topics such as this.

My hope that the findings within this thesis will contribute to the implementation of *Smile agus Sláinte* – notably those aspects of the policy that rely upon private GDPs' voluntary engagement with state care. Notwithstanding the publication of the policy's implementation plan and the potential for there to be a lengthy lead-in to any system change, I feel there are aspects of the current system, namely the DTSS, which could and should be changed sooner rather than later to further stabilise existing services and prevent further workforce attrition. I hope the findings of this PhD can inform that change. From the outset, as a clinician-researcher, having seen the impact of a lack of routine care provision on vulnerable population groups including children and medical card holders in the current system, I wanted this research to be policy, service and population health relevant. Similarly, having witnessed the immense and well-meaning work that goes into policy development (having worked in this field in the UK), and as someone who is broadly supportive of *Smile agus Sláinte's* roadmap, I don't want to see this opportunity wasted. Additionally, under the HRB SPHeRE Programme under which my PhD was funded, there is an expectation that the research produced by scholars needs to have policy relevance. My research aligns with the following SPHeRE research areas: 'workforce', 'service delivery' and 'access to care'. For that reason, it was my intention from the early stages of this PhD research that I would actively think about how to make my work relevant to important issues in oral healthcare in Ireland and proposing solutions for them. As outlined in section 6.3.2.5, another aspect of the system which I believe will be instrumental in shaping Ireland's oral health workforce into the future is the dental education. I am in the very fortunate position to have been appointed and recently started working as a Clinical Lecturer in Ireland's newest school of dentistry within the Royal College of Surgeons in Ireland (RCSI). This is the first new undergraduate dental programme in Ireland 100 years and will see students trained in facilities located close to local communities.

This PhD research journey has been instrumental in affording me a wealth of new knowledge in research methods as well as in health systems, complexity and diagnosing and proposing solutions for messy, wicked problems in healthcare – namely workforce recruitment and retention. I now have an appreciation for that oft-cited term in research 'systems thinking'. Systems thinking is difficult and as a frontline dentist whose background is primarily clinical in public funded primary care, this PhD really challenged me to think beyond the confines of the four walls of the dental clinic and to start thinking at health systems level, something which my primary supervisor Dr. Sara Burke repeatedly encouraged me to do. While I did come to this PhD with some experience

working at health system level, i.e., in workforce policy, I feel I have, up to now, viewed the dental world through the lens of a clinician. My previous role in health policy was in assisting the development of new postgraduate training pathways for dentists and was largely prescribed by earlier policy. My role to deliver on assigned tasks and bring my experience as a clinician to the table, however unlike a PhD or substantive research post, I feel it did not challenge me intellectually to think at health systems level or consider the importance of complexity or how to solve big societal challenges of our time.

6.5.4 Reflections on the use of realist approaches

Prior to commencing my PhD, I had just completed a Masters in Dental Public Health (MDPH) where my dissertation methodology was purely quantitative – examining the reliability and validity of an oral health-related quality of life (OHRQoL) tool. Prior to that, when I lived in England (and laterally when I moved back to Ireland just before the COVID-19 pandemic), I worked as a Clinical Fellow at NHS Health Education England (HEE). During my time at HEE, I undertook informal literature reviews, stakeholder engagement exercises and primary qualitative research in the form of focus group discussions (FGDs), exploring factors influencing the career aspirations of dental foundation trainees (Thomson et al., 2021). Earlier in my career, I completed a Master of Science in Primary Dental Care during which I completed a systematic review exploring the efficacy of periodontal maintenance carried out in primary dental care (Leavy & Robertson, 2018) and at the end of year one of my PhD, I undertook a scoping review as part of my SPHeRE Programme National Placement at the TCD School of Dentistry (Leavy & Daly, 2025). This research experience, in particular the systematic and scoping reviews meant I had gained experience with those methodologies, including developing search strategies, searching for, extracting, quality appraising and synthesising data. When I look back, I recall undertaking the systematic review of periodontal maintenance outcomes through a purely 'clinical' (and quantitative) lens – focussed on periodontal parameters and outcomes as the sole measures of treatment success based on the location and type of care provided and without regard for other contexts or nuances that might have influenced treatment outcomes. While I appreciate that is how systematic reviews are conducted and I am grateful for the experience I gained, I realise now the potential shortcomings in such an approach as it did not delve any deeper to try and explain why certain treatment modalities worked well for some patients, but not others. I don't even recall ever asking myself or my supervisor at the time why this might be the case.

Before entering my PhD programme, realist methodological approaches were something I was unaware of. However soon after joining the team at the Centre for Health Policy and Management

(CHPM) at Trinity College Dublin, where I am based, I quickly begin hearing about realist reviews as this was an approach used by several colleagues within the centre. I also briefly learned about realist methods during a research methods lecture as part of my year one SPHeRE programme. In my first year when I was still in process of developing my PhD research question and proposal, I had briefly broached the possibility of conducting a realist review however my then primary supervisor, Dr. Sarah Barry, suggested exploring other possible methodologies to address the research question. That is when I considered a scoping review, Cavana and Maani's 'Systems Thinking and Modelling' framework and Group Model Building (GMB). Sarah was keen for me to push myself and learn about other new and potentially novel research approaches. Unfortunately, Dr. Sarah Barry unexpectedly departed Trinity College Dublin, and I was assigned a new supervisor, Dr Padraic Fleming, who had a keen interest and experience in conducting realist reviews with a health systems focus. On reviewing my research proposal, he suggested that the area of investigation was well suited to a realist review and interview-based study as it was a complex area of inquiry and focussed on health systems. As previously outlined, there were also practical and pragmatic considerations which meant a realist approach was more appropriate, namely the absence of methodological expertise in the afore outlined 'Systems Thinking' and GMB methodologies both within the CHPM and more widely in Ireland, and time constraints as I was into my 2nd year of my PhD. I subsequently became quite interested in finding out more and I set about reading realist reviews. Learning more about realist studies, I was interested in the idea that they were ideal for investigating and making sense of complex problems in open systems such as health systems. The iterative nature of realist studies was something which I had not previously encountered in any other form of research, and it therefore piqued my interest. I quickly came to the realisation that their iterative nature meant that these approaches were better able to reflect the requirements of research procedures where a study's emerging findings inform the subsequent direction, methodology, synthesis and analysis. In contrast to systematic or scoping reviews, what I also found interesting was the requirement of realist researchers to apply a level of intellectual honesty to the process whereby absolute 'objectivity' and neutrality is set aside and a degree of subjectivity is applied to the extraction, analysis and synthesis of data, based on their own knowledge, experience and creativity. As someone who likes to be creative in art and writing, I was drawn to the idea of learning a completely new type of methodology and applying these creative skills to this research and the notion of using literature and primary data to create new findings and build meaningful theory as I did with my CMOCs.

Notwithstanding this, while I thoroughly enjoyed conducting the realist review and interview study (and am already thinking about potential new realist studies), I did find the methodology

challenging, especially at the start when I realised, I would need training and support. Indeed, even to this day, I am still only getting comfortable with the methodology and feel I still have much to learn. I was extremely fortunate that as part of my PhD programme, SPHeRE provided funding for me to travel to the University of Oxford to undertake a one-week training course in realist reviews and realist evaluations delivered by Dr. Geoff Wong and Dr. Claire Duddy. Additionally, I am grateful to have had researchers with expertise in realist research on my supervisory team throughout the time I was conducting these studies. They say lightening doesn't strike twice but, in my case, it did. My second primary supervisor, Dr. Padraic Fleming unfortunately also departed TCD in August 2023 when I was in the early phase of building CMOCs for my realist review (I've tried not to take these supervisor departures personally). Dr. Sara Burke took over my supervision in August 2023 and invited Professor Blánaid Daly and Dr. John Ford to join my supervisory team to provide on-going realist and oral health support. John is a Public Health specialist based at Queen Mary University London in the UK and has acted as a co-supervisor to other PhD scholars in the CHPM. I have also tried to engage with the wider realist community. I am a member of the RAMESES network and therefore keep abreast of other realist researchers' work through the RAMESES mailing list and I have watched various webinars on the 'Realist Hub' (https://therealisthub.org/), including how to conduct realist interviews. On reflection, I feel having realist-informed supervisors really helped me throughout this journey and I am forever grateful for the support and encouragement I received, particularly Dr. John Ford who made himself readily available when needed. Throughout my PhD I found I was constantly having to explain to people (lay people and researchers alike) what realist research is (and this wasn't or indeed still isn't always easy to do!). As the methodological approach is not as widely known as other more 'traditional' methods, I believe there is a continued need for peer support and mentorship within this space. From what I have observed (based on my own experience and reading through the many RAMESES network emails) the realist community is small but very supportive with little or no judgement being placed on individuals for asking 'silly questions'. I also find it comforting that some of the 'big hitters' in scientific realism, including Ray Pawson himself have responded to some of these RAMESES network queries from fellow early career and burgeoning realist researchers. I am still getting comfortable with these approaches myself. One of the things I frequently reflected on throughout this PhD was that as a dentist, I am so used to carrying out procedures, like fillings or extractions, in a very set and regimented way and seeing an immediate result. Undertaking realist research (and the PhD in general) with all the 'back and forth' and uncertainty that arises from the iterative processes and the absence of 'quick wins' or immediate results meant at times I experienced discomfort and frequently questioned my ability to conduct this type of research adequately. I

would like to think that going in the next phase of my career, I will be able to continue leaning on other realist researchers for support and one day, I will be in position to support and mentor someone starting their own realist adventure.

6.5.5 Reflections on the use of documentary and secondary data analysis

As an Irishman who had spent 16 years training, living and working in the UK, I considered, and to this day, still consider myself to be 'an outsider' in the Irish oral health system. I feel this comes with advantages and disadvantages. Starting as a dentist in Ireland, it meant I had little or no insight into the Irish oral healthcare system and knew very few dentists here. Having been embedded in and having in-depth knowledge of the UK oral healthcare systems and having built a network of friends and colleagues across England and Scotland, I found the move home professionally isolating. COVID-19 didn't help. I loved my job at NHS HEE working at health system level on oral health policy and remember thinking pessimistically that I would struggle to find a similarly rewarding opportunity here in Ireland. I was wrong of course and have relished this past six years as a researcher, clinician, educator and State Board appointee (on the Dental Council) in the Irish system. Conversely, as my co-supervisor Professor Daly once said to me, being an outsider has it's advantages, namely being able to carry out oral health systems research with a largely unbiased, fresh set of eyes and with relative anonymity.

During the first year of my PhD, I attended various lectures and workshops as part of the SPHeRE Programme taught modules and immediately prior to that, I had just completed my MDPH. These gave me a good grounding in the Irish health and oral health systems structures and their political and policy contexts. Around the time I was commencing my own PhD research, my fellow (then) PhD scholar, dentist and friend Dr. Úna McAuliffe had just published her first PhD study ('Toothless' —the absence of political priority for oral health: a case study of Ireland 1994–2021) which was the first study of oral health policy in the Irish context. Úna McAuliffe's seminal study provided further enlightenment into the oral healthcare system and has been of immense benefit to me, providing important key contextual data in this thesis and acting as a reliable point of reference throughout. I wanted to build on this work by conducting an appraisal of the Irish primary oral healthcare system and its origins, but from a GDP workforce perspective as was necessitated to meet the objectives of this thesis and provide a clear outline of the problem under investigation. Documentary and secondary data analysis were ideal for this, and like realist approaches, were a new departure for me as a researcher. Use of secondary data in particular is an approach that has been adopted by colleagues within the CHPM so it felt like a natural fit. As a method, secondary data analysis gave me great experience in identifying, accessing, handling and reinterpreting

someone else's data. More specifically, it allowed me to manipulate raw data for the purposes of clearly articulating the extent of Ireland's GDP workforce challenges before delving into how and why these challenges emerged as per the realist analyses. As highlighted in section 2.4.3 above secondary data analysis proved to be an extremely efficient means of building a picture of the GDP workforce in Ireland, given that much of the data I required (and originally planned to capture by survey) were publicly available.

For clarity, the documentary and secondary data analysis study was originally planned to be the second study of this PhD however it was during the period just before John Ford joined my supervisory team, that I expedited this study as study one. In retrospect, this was not only pragmatic, but it allowed for a more logical flow through the PhD research (i.e., framing the workforce problem (the 'what') à diagnosing the workforce problem (the 'how' and 'why'). By bringing those analyses together with the realist review and interview study this final chapter of the thesis, I could then 'close the loop' of inquiry by showing how we got to where we are in Ireland, from a health systems perspective and understanding some the complex system dynamics at play.

6.6 Implications of thesis research

This thesis has produced findings which are relevant to policy, practice and research in Ireland and elsewhere. The findings in study three are broadly in alignment with the published literature but now, for the first time in the Irish context, provide robust, primary evidence for policy makers and health system leaders and managers to potentially inform and leverage system change at various levels to increase private GDPs participation and engagement in state dental schemes now and into the future. As demonstrated throughout this thesis, while complex, this change must begin at the top, with improved political and health system priority, funding and resource commitment to oral health, where contracts designed around contemporary, evidence-based practice where prevention is rewarded and where GDPs (and indeed wider members of the dental team) are clinically and financially supported to improve population health outcomes and where clinical autonomy is facilitated as far as practicable. How the health system (at all levels) and frontline profession engage and communicate with one another will be key in fostering shared decision making, consensus, trust and good working relationships. With the forthcoming implementation of *Smile agus Sláinte* leveraging these system changes will be key in informing the direction of proposed workforce changes, the reorientation of services and overall success of the policy in increasing access to timely care for patients and reducing oral health inequities. Specific implications will be discussed in further detail below.

6.6.1 Policy and practice implications

Ireland's oral healthcare system leaders find themselves in the unenviable position where they are faced with two distinct, but intrinsically related challenges as they relate to HSE-funded primary oral healthcare services. Firstly, there is the need to address current workforce capacity shortcomings and stabilise existing primary care services. This not only includes the DTSS, but HSE salaried Oral Healthcare Services which have also experienced a reduction in workforce capacity in recent years. Crucially, HSE salaried services will be required to continue managing eligible paediatric populations until such time as these are transferred over to private dental practices in line with *Smile agus Sláinte* (2019). At the current time, delays to the HSE dental school screening programme in some HSE regions mean many children are not being assessed until the age of 12 or 13 (Houses of the Oireachtas, 2025b). This is subsequently widening the gap even further between cohorts of children currently being managed by the HSE OHS and those which *Smile agus Sláinte* anticipate will initially be cared for by GDP-contractors, i.e., 0 to 2 year olds (Department of Health, 2024). Concurrently, there is the requirement to develop new care pathways or 'packages' for eligible populations, namely children, which will be delivered by private GDP contractors. As demonstrated in this thesis, the successful realisation of these new arrangements will require significant buy-in from a largely disillusioned and disengaged workforce. The job of health system leaders therefore lies not only in 'fixing' the current DTSS contract to maintain or increase levels of GDP engagement (and therefore access to care among eligible populations) but designing new contracts which will address the many system challenges and appeal to GDPs prospectively.

While the findings of this thesis may appear bleak (and I have attempted to present these in as balanced and objective a manner as possible), there are some recent positive developments which have the potential to bode well for the future of state funded oral healthcare in Ireland. These 'green shoots' include the establishment of an oral health unit within the Department of Health (Dental Council of Ireland, 2024), increased investment in core HSE-funded oral health services (including €15m in recurring funding to support progression of the National Oral Health Policy) and the recent opening of a new school of dentistry in Dublin which will see dental undergraduates trained in community-based settings (Royal College of Surgeons in Ireland, 2025). Additionally, and while this may seem trivial, the inclusion of oral health in the recently published *'Sláintecare 2025+ Path to Universal Healthcare'* report reaffirms the Irish Government's commitment and intent to support the implementation of *Smile agus Sláinte,* whose implementation plan is due to be published in 2025 (Government of Ireland, 2025a). Furthermore, recent messaging from the Irish Dental Association suggests their willingness to work

collaboratively with government on system reforms and support *Smile agus Sláinte's* implementation (Irish Dental Association, 2025). Lastly, *Smile agus Sláinte,* the first oral health policy in 30 years in and of itself, is positive and provides a roadmap for the future of oral healthcare in Ireland. Having a national oral health policy or strategy is seen as key in driving forward UHC for oral health among WHO members and given *Smile agus Sláinte's* close alignment with GOHAP, this represents a good starting point for change.

6.6.1.1 Improving availability, accessibility, acceptability, quality and service utilisation

While the aim of this PhD was not to devise specific recommendations or action points for informing system change, it does provide, for the first time, evidence that is specific to the Irish context and which health systems leaders could act upon to advance *Smile agus Sláinte* policy implementation. More specifically, the Government of Ireland and HSE leadership should capitalise on the 'green shoots' outlined above and explore ways to encourage and enable private GDPs to meaningfully participate in publicly funded, contracted primary oral healthcare now in the future with the ultimate aim of improving accessing to routine and preventative care for Ireland's most vulnerable populations.

The findings of this thesis suggest a need for increased and sustainable investment in the primary oral healthcare system where contracts are designed with a stronger focus on prevention, and where the profession is meaningfully engaged with on contractual arrangements, including clinical supports and care pathways. Crucially, for those patients for whom the complexity of their needs and ability to tolerate dental treatment may preclude delivery of care in general dental practice, ensuring there are appropriately resourced secondary and tertiary care pathways in place and where the role of primary oral healthcare providers is clearly defined in such pathways, will be key in supporting GDPs and patients alike.

On the DTSS (and any future public scheme), there is a need for clearer criteria on treatment eligibility, streamlined prior approval and scheme administrative processes as well as expanded clinical and professional supports for GDPs. Implementing such changes would support GDPs in delivering timely treatment, increase their sense of professional value working within the public system and therefore could reduce barriers to care access for patients.

Finally, on communication, engagement and governance, there is a need to establish formal consultative processes between the profession and health system at all levels, for example, joint forums and monitoring committees. Additionally, engaging GDPs directly in quality assurance processes could assist in fostering a sense of system ownership, reciprocity and ultimately build trust between the frontline profession and the system.

While these recommendations are predominantly specific to Ireland, aspects are likely to be applicable to other high-income jurisdictions which utilise similar models of contracting publicly financed primary oral healthcare to private dentists.

6.6.2 Directions for future research

As previously highlighted, there is a dearth of primary research on oral health systems and policy in Ireland, making it somewhat of a 'green field' in terms of future research opportunities. As highlighted in the WHO Global oral health action plan, there is a need to advance the oral health research agenda *"to focus on public health and population-based interventions, taking into account the wider NCD, primary health care, UHC and health system context".* There is a momentum built up for the continued production of high quality, policy-relevant oral health systems research in Ireland and therefore this must be maintained into the future. The absence of robust oral health workforce data intelligence in Ireland remains a key shortcoming. As outlined already in chapter three (study one), a logical next step from the secondary data analysis could be to conduct a detailed survey-based study further examining the GDP and extended oral healthcare workforce and dental practice characteristics in Ireland. While the data available publicly for study one were extremely useful in starting to build a picture of the GDP workforce in Ireland (as it relates to the two dental schemes), they lack detail on other aspects of the workforce including wholly private GDPs, practitioner nationality and ethnicity, additional qualifications held and actual level of clinical commitment or patterns of work. Furthermore, there is scope to explore the composition of primary care dental teams across Ireland including their use of role delegation and skill mix utilisation. Considering *Smile agus Sláinte* and WHO aspirations on adopting innovative workforce models and task shifting, this would be a worthwhile and priority area for research in Ireland.

A further piece of research which could be conducted utilising publicly available data would be a replicated and updated secondary data analysis as per study one but extended across the remaining four HSE Health Regions. This would allow for a more comprehensive assessment of DTSS and DTBS contract coverage nationally and would further facilitate a comparison of contractors across the state to ascertain if there are any other differences in participation regionally.

In terms of realism, at a later point in time, a realist evaluation of policy implementation of *Smile agus Sláinte* in Ireland would present an opportunity to understand how, why and to what extent oral health policy is implemented (or not) in Ireland. An oral health system case study could adopt a similar approach to Greenhalgh et al. (2009) in their realist evaluation of health system

modernisation efforts in London and explore outcomes related to the extent of oral healthcare system transformation in Ireland (as proposed in *Smile agus Sláinte*). It could explore how system change was shaped, enabled, and constrained over time through the interaction of different contexts and mechanisms of change (Greenhalgh et al., 2009). This piece of work could also examine how financial and other incentives interact with other health system features in order to achieve a more preventative, patient-oriented system with better oral health outcomes. Like the realist review and interview study in this thesis, it could provide realist, causal explanations for observed outcomes relevant to system reforms as proposed in *Smile agus Sláinte*.

Finally, as highlighted in the limitations above (section 6.4.2), there remains a dearth of contemporaneous data on population oral health needs in Ireland as well as primary research examining patients' and the public's experiences of accessing services. The absence of nationally representative population oral health data is a potential barrier to policy implementation and monitoring of system reforms and strengthening in Ireland. There have been no nationally representative data on caries or other oral diseases prevalence among the entire population captured since the early 2000s, albeit there have been regional and population subset studies conducted in more recent years (see section 2.7.4 on FACCT and TILDA studies). New research is now required to ascertain the level of unmet oral health needs in Ireland and, as highlighted in *Smile agus Sláinte* and by the WHO, there is a need to establish a national oral health evaluation and smart surveillance programme for WHO indicative age groups integrated with routine primary oral healthcare visits. These efforts will require collaboration and agreement between the health system, academic experts, service providers and patients alike.

While this PhD research has demonstrated the value of realist and qualitative research in identifying health system factors influencing GDP engagement in state-contracted care, additional research is needed to ascertain and understand the opinions, views and experiences of patients, families and the public who have been identified as key policy stakeholders in *Smile agus Sláinte* (Department of Health, 2019). As noted in sections 6.3.3.1 and 6.3.3.3.2, many dentists interviewed in study three perceived that oral health was, in general, of limited priority or value amongst the Irish population, especially medical card holders. While it might be speculated that these perceptions are borne out of misinformed collective cultural 'memory' amongst GDPs, the limited data available elsewhere suggest that high out of pocket private costs and lack of information or knowledge on oral healthcare services may play an important role in driving non-attendance and therefore this perceived apathy towards oral healthcare. As another under-researched area with oral healthcare, it would be important to explore and possibly counter this perception of 'apathy' amongst patients and the public in Ireland (and elsewhere). Indeed, previous

research has shown that among vulnerable and marginalised communities, for example homeless people, and contrary to the received wisdom, these groups may not necessarily be apathetic or disinterested in oral health but rather their failure to seek dental care may be due to other competing priorities like finding a bed to sleep in or systemic barriers to care for example, availability and accessibility of services (Daly et al., 2010).

Garnering the perspectives and experiences of patients and the public around accessing primary oral healthcare, their oral healthcare aspirations and the value they place on oral health with competing individual and family priorities will be key in informing the implementation of *Smile agus Sláinte* and addressing not only access challenges, but potential challenges associated with future oral healthcare system reform (Rosing et al., 2019). The benefits of population and community-based participatory research in addressing the determinants of health and reducing oral health inequalities among vulnerable populations, especially lower socio-economic cohorts has been demonstrated elsewhere (Ramji et al., 2020). In the Irish context, and against the backdrop of oral healthcare system reform, it is therefore imperative to engage and collaborate with these populations as a matter of priority to ensure their voices are heard (Dijkstra & Horstman, 2021; Ramji et al., 2020).

6.6.3 Contribution to original knowledge

As noted earlier, one of the overarching strengths of the thesis is its novel contribution to original research, especially in Ireland. As highlighted in section 6.4.1, it deepens a very shallow pool of evidence related to oral health systems and policy globally and a virtually non-existent pool in Ireland (with the notable exception of McAuliffe and colleagues' earlier work)(McAuliffe et al., 2022). To the best of my knowledge, study three is the first ever primary research study exploring the reasons behind dentists' participation in publicly funded contracted primary oral healthcare schemes in Ireland. While many of the issues raised throughout this thesis, for example on oral health priority and DTSS funding are, arguably, 'known' (especially within the dental profession in Ireland), this research for the first time reinforces and indeed advances our knowledge on this topic through robust primary research evidence.

The reasons I decided to research this topic were twofold: to understand clearly the extent of, and reasons behind the current participation and patient access challenges in the DTSS and therefore understand what system requirements would be needed to build workforce capacity for system reforms planned under *Smile agus Sláinte*. This research therefore has the potential to not only inform positive system change now (and improve access to care for medical card patients) but

inform the successful implementation of *Smile agus Sláinte,* especially aspects that require private GDP buy-in.

On reviewing the literature, the majority of the published research regarding dentists' participation in state funded primary oral healthcare has thus far has come from the UK and is focussed on contract level factors, practitioner or dental practice level factors. Furthermore, most published studies often presented results from the perspectives of GDPs who were roundly dissatisfied with the contracts under which they practised. While there were some studies identified which did consider the health system perspective and how system level factors influence GDP engagement, for example Harris et al., (2015), broadly speaking this type of research is lacking and non-existent in Ireland. This PhD research has confirmed several findings from previous studies conducted out with Ireland, therefore adding to the existing evidence base. Moreover, it has gone further than other studies by deepening our understanding of how, why, for whom and under what circumstances health system factors can influence GDPs' decisions to engage in the provision of state financed care. As such, it provides insights for health policymakers and system leaders on how they might leverage system change in order to retain GDPs currently providing care on behalf of the state and encourage and incentivise new GDPs into the public system. This research outlines how models of contracted primary oral healthcare can be better planned, resourced and operationalised in order to facilitate a system where GDPs feel engendered to deliver high quality, contemporary dental care (and are rewarded appropriately for doing so) but more importantly, where they feel valued and part of the system. The findings from studies two and three demonstrate that these findings are applicable across oral health systems and not just Ireland. Therefore, these findings are even more relevant in the context of jurisdictions worldwide needing to strengthen their respective oral healthcare systems in order to boost workforce, widen access to timely care and reduce oral health inequities in the drive to achieve UHC for oral health.

6.7 Chapter conclusion

The aim of this PhD was to identify and explain what the health system factors are influencing private GDPs' participation in publicly funded, contracted primary oral healthcare services and therefore the implementation of workforce changes as part of service reforms proposed in *Smile agus Sláinte* – National Oral Health Policy (2019). The main findings of this thesis are the declining number of private GDP-contractors participating in the DTSS for low-income adults while the eligible population has increased. Private GDPs' engagement in state-funded contracted primary oral healthcare is influenced by a myriad of complex and often inter-related health system factors. At a high level, low political and health systems priority for oral health persists globally and in

Ireland, shaping policy intent, primary oral healthcare funding allocation, and service design. Background economic conditions and societal preferences can also influence these, and the wider oral healthcare 'market' dynamics. Public oral healthcare systems, including Ireland's, maintain an emphasis on costly dentist-focussed, restorative care models over prevention leading to care rationing and cost containment measures within state contracts. The resulting constraints on clinician autonomy and perceived low remuneration can push dentists toward the private oral healthcare sector, where financial rewards and the prospect of independent practice are perceived to be an attractive alternative to state-backed care. The way in which the health system and profession engage and communicate with one another can be a powerful force in shaping relationships and GDPs' willingness to provide state funded care. Poor or perceived adversarial communication, alongside the absence of feedback or consultative mechanisms between the health system and GDPs can undermine trust and lead to professional isolation. Professional networks can amplify dissatisfaction with state care and promote private practice.

As Ireland looks to implement much needed oral healthcare system reforms commensurate with both *Smile agus Sláinte* and the WHO Global oral health action plan, it is my hope that the findings of this PhD thesis will provide health system leaders with the necessary evidence required to inform these changes, notably with respect to GDP engagement in contracted care, with the ultimate goal of improving access to care for vulnerable populations and reducing oral health inequalities.

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Appendices

Appendix 1: Study 1: Email communication with HSE PCRS: supplementary data request and data (number of dentists submitting DTSS claims 2018-2022)

From: Paul Leavy <leavypa@tcd.ie>
Sent: Tuesday 31 October 2023 10:31
To: [redacted]>
Cc: [redacted]AND PCRS <AND.PCRS@hse.ie>; ARU <ARU@hse.ie>
Subject: Re: Dtss items of service and fees

Dear [redacted]

I hope you had a good long weekend. Many thanks for your detailed email reply and for the clarity regarding PCRS figures. These are most helpful.

With regard to your reply to point 1, would it be possible for you to provide figures for the number of dentists who submitted claims for other years please? I am currently utilising PCRS data for the years 2008-2022. Or if you could signpost me to where these are please?

If so, that would be most appreciated.

Kind regards

Paul

Paul Leavy
SPHeRE Programme PhD Scholar

[redacted]hse.ie>
to me, [redacted]

Hi Paul

We have reviewed your request and noted from 2008 to 2017 data can be sourced on our website

https://www.hse.ie/eng/staff/pcrs/pcrs-publications

click on Access the Reporting and Open Data Area.

Click on PCRS Annual reports
See DTS: Number of Dentists with HSE DTS contracts by payment range

We will work on the years 2018 to 2022

If you have queries please contact us

Kind Regards
[redacted]

Paul Leavy <leavypa@tcd.ie> 20 Dec 2023, 14:22

to [redacted]

Dear [redacted]

Hope this email finds you well. Thanks again for providing clarity on the DTSS active dentists.

I appreciate we are coming up to Christmas holidays but I was just wondering if there was any update on the 2018-2022 figures please?

Kind regards

Paul
Paul Leavy
SPHeRE Programme PhD Scholar

[redacted]@hse.ie> 21 Dec 2023, 13:25

to me

Hi Paul

Sorry for the delay please find the results attached of the below query.

Have a lovely Christmas

Kind Regards
[redacted]

Analysis and Reporting Unit
HSE Primary Care Reimbursement Service ,Exit 5 M50, North Road, Finglas, Dublin 11, D11 PXTO
Seirbhís Aisíocaíochta Cúraim Phríomhúil, Bealach amach 5, M50, An Bóthar Thuaidh, Fionnghlas,
Baile Átha Cliath 11, D11 PXTO

	A	B
1	**Year**	**No of Dentists**
2	2018	1,366
3	2019	1,321
4	2020	1,223
5	2021	985
6	2022	831

Appendix 2: Study 2: Realist Review study protocol

NIHR | National Institute for Health and Care Research

PROSPERO
International prospective register of systematic reviews

How and why do health system factors influence the supply of dental professionals in publicly funded, contracted primary oral healthcare services: a realist review

Paul Leavy, David Mockler, Padraic Fleming

To enable PROSPERO to focus on COVID-19 submissions, this registration record has undergone basic automated checks for eligibility and is published exactly as submitted. PROSPERO has never provided peer review, and usual checking by the PROSPERO team does not endorse content. Therefore, automatically published records should be treated as any other PROSPERO registration. Further detail is provided here.

Citation
Paul Leavy, David Mockler, Padraic Fleming. How and why do health system factors influence the supply of dental professionals in publicly funded, contracted primary oral healthcare services: a realist review. PROSPERO 2024 Available from https://www.crd.york.ac.uk/PROSPERO/view/CRD42023391110

REVIEW TITLE AND BASIC DETAILS

Review title
How and why do health system factors influence the supply of dental professionals in publicly funded, contracted primary oral healthcare services: a realist review

Original language title
English

Review objectives
In 2021, UN member states agreed to adopt the World Health Organization's (WHO) global strategy on oral health with an emphasis on developing universal health coverage (UHC) for oral health, reaching all communities by 2030 (World Health Organization, 2022a). Many health systems worldwide employ a model of contracting state-financed primary oral healthcare services to independent, private general dental practitioners (GDPs), who deliver the majority of dental care alongside wider members of the dental team (Ziller, 2008). As this model relies on a steady supply of dentists and other dental healthcare professionals (DHPs) opting into or remaining in such services, there is a need to understand how health system factors impact

this; why, how, for whom, and under what circumstances.
The aim of this realist review is to identify health system factors influencing dentists' and other DHPs' participation in publicly funded, contracted primary oral healthcare services and to understand their underlying mechanisms and theoretical origins.

Keywords
Dental, Dentist, Public, Recruitment, Retention, Workforce

SEARCHING AND SCREENING

Searches
Informal and iterative background literature searching will scope existing peer-reviewed literature and other sources as required. This will allow for familiarisation with the topic and inform the development of initial programme theories (IPTs) to steer future systematic searching.
Formal systematic searching of peer-reviewed literature will then be conducted to test IPTs. Online databases will be searched within the date range 2000 to the date of searches. Where appropriate, additional searches will be conducted at a later point in time to strengthen the evidence base for emerging themes. Subject headings, Boolean logic and other relevant key terms will be used in the searches with the assistance of a Trinity College Dublin subject librarian to ensure the robustness of search syntaxes.
Databases: Web of Science Core Collection, Embase, MEDLINE (OVID) and APA PsycINFO.
A supplementary search of 'grey' literature will be carried out using the Google Scholar search engine via Harzings Publish or Perish tool.

Study design
No restrictions will be placed on the types of studies (study designs) deemed eligible for inclusion.

ELIGIBILITY CRITERIA

Condition or domain being studied
Recruitment or retention in publicly funded, contracted primary oral healthcare services.
Health systems rely on personnel to function adequately and therefore ensure timely access to high quality care for patients. The workforce is recognised as one of the six 'building blocks' of health systems, alongside service delivery, information, medical products, vaccines and technologies, financing and leadership and governance (Stockton et al., 2021). Recruitment and retention of healthcare professionals is a global challenge with the WHO estimating a shortfall of 10 million healthcare workers by 2030 (World Health Organization, 2022b).
As frontline healthcare professionals, dentists and wider dental healthcare professionals (for example, dental hygienists and therapists) play a key role in ensuring individuals achieve their best oral health and by extension, best overall general health and quality of life (QoL) (Watt et al., 2014). To deliver on the WHO global strategy on oral health, it is recognised that health systems globally will need to enhance the capacity of their respective oral health workforce (Winkelmann et al., 2022).

Population

Independent (private) general dental practitioners (GDPs) providing primary oral healthcare services under contract to a state or public health authority.
Other dental healthcare professionals (DHPs), namely dental nurses or assistants, dental hygienists, dental or oral health therapists, orthodontic therapists, dental technicians or clinical dental technicians participating in or providing publicly funded, contracted primary oral healthcare services as part of the wider dental team.

Intervention(s) or exposure(s)

Any health system factor impacting or influencing recruitment or retention of GDPs' or other DHPs' in publicly funded, contracted primary oral healthcare services.
Inclusion criteria
Studies focussing on:
a) Publicly funded, contracted primary dental care services;
b) Health system factors, as defined by the WHO Health Systems Framework, namely: health service delivery, workforce, heath information systems, access to essential medicines and technologies, financing, and leadership and governance, and their effects on (a) above;
c) The OECD area: Australia, Canada, Chile, Columbia, Costa Rica, Iceland, Israel, Japan, Korea, Mexico, New Zealand, Norway, Switzerland, Turkey, UK, USA and the European Union (excluding Bulgaria, Croatia, Cyprus, Malta and Romania). The OECD has been selected because most members are high-income and developed economies
Exclusion criteria
Studies focussing on:
a) Publicly funded, non-contracted primary dental care services ONLY (i.e., salaried/community/public dental services operated directly by state health authority);
b) Other health and social care professionals ONLY (e.g., medical doctors or nurses);
c) Dental care delivered in non-primary care settings (e.g., hospital dental services) or wholly specialist services (e.g., orthodontics, oral surgery) ONLY;
d) Provision of private primary dental care ONLY with no consideration for subsequent impact on GDP or other DHP participation in publicly funded, contracted care

Comparator(s) or control(s)

Not applicable

Context

Many jurisdictions are experiencing workforce shortages in oral healthcare, most notably in state funded primary care (Boynes at al., 2022; O'Neill, 2022; British Dental Association, 2022). A recently published scoping review exploring these challenges in the UK found several factors affecting recruitment and retention. Among dentists, the most frequently cited factor was the National Health Service (NHS) England contract which operates on a target based model (Evans et al., 2023). This model is believed to account for high levels of stress and burnout among dentists with many being driven 'out of the profession' due to high workloads. Other reported factors included suboptimal remuneration and increased practice and professional costs leading to long term reduction in incomes and limited opportunities for career progression. In their 2012 paper, Brocklehurst and Tickle utilised 'systems thinking' to better understand what factors need consideration when planning for an oral health workforce in the UK NHS (Brocklehurst and Tickle, 2012). They examined the complex interactions between factors on the demand and supply side of care and suggested that the net flow of dentists in the system

was dependent on a myriad of factors including the right legislative environment, contractual arrangements, financial support and incentives, skill mix utilisation and market forces driven by people expressing a need for care.
In the context of change implementation and workforce planning, understanding complex system drivers and how they influence the capacity of the system to deliver services can help bridge or avoid policy implementation gaps.

OUTCOMES TO BE ANALYSED

Main outcomes

This realist review seeks to produce a refined programme theory or theories to explain why, how, for whom and under which circumstances health system factors influence or impact upon recruitment or retention of GDPs and other DHPs in publicly funded, contracted primary oral healthcare services.
Distal outcomes of interest include:
Recruitment (inflow of personnel into services) of GDPs or other DHPs into publicly funded, contracted primary oral healthcare services.
Retention (avoidance of outflow of personnel) of GDPs or other DHPs already working in publicly funded, contracted primary oral healthcare services.
The contexts which trigger mechanisms that produce outcomes of interest.
The interplay between contexts and mechanisms by which health system factors are assumed to result in these outcomes.

Additional outcomes

Owing to the iterative nature of realist reviews, other outcomes of interest may emerge during the initial programme theory development stage.

DATA COLLECTION PROCESS

Data extraction (selection and coding)

Search results with be managed using Endnote™ 20 reference management software to include removal of duplicates and uploading of full texts. Studies deemed eligible for inclusion will be managed using Covidence online systematic review management software.
Selection and appraisal of selected sources will take place in two phases:
1. The principal PhD researcher (PL) will screen titles and abstracts of selected citations utilising the inclusion and exclusion criteria developed a priori.
A second PhD researcher (SMS) will screen 10% of titles and abstracts independently for quality control and consistency of selection. Any disagreements between the researchers will be referred to PF (Research Supervisor) for mediation.
2. PL will subsequently screen full texts utilising the inclusion and exclusion criteria. A preliminary assessment of the relevance and rigour of studies will also be carried out.
Some sources may be utilised to inform the development of initial programme theories, however they will be excluded from the review itself, for example, opinion commentaries not containing data relevant for extraction. A separate, descriptive data spreadsheet of sources utilised to inform the IPT(s) will be collated.
SMS will screen 10% of full texts for quality control and consistency of selection. Any

disagreements between the researchers will be referred to PF.
Full texts of included studies will be uploaded to Nvivo qualitative analysis software which will be used to code findings. Coding will be undertaken by PL both inductively using primary study data and deductively based on IPT(s). Concepts that are considered relevant to IPT(s) will be used to inform the coding process. Broadly speaking, concepts will be mapped to either contexts ('C'), mechanisms ('M'), or outcomes ('O') and, where data exists, how these relate to one another to form 'context-mechanism-outcome' ('CMO') configurations (‘CMOCs’), which will also be coded.

Risk of bias (quality) assessment

A project advisory group (PAG) will be established from the outset to consider emerging findings of the realist review, to help confirm, refine, or refute preliminary findings including emerging theories, based on their experience. The PAG will comprise stakeholders including researchers and academics with expertise in realist methods, health systems, dental public health and oral health policy, front line clinicians, civil servant and patient and public representatives.
The quality of included selected studies will be assessed on the following two criteria:
Relevance: do the findings inform the development of, confirm, refine, or refute IPT(s)?
Rigour: how credible and trustworthy are the methods used?
The review findings will be reported in adherence to the RAMESES quality standards for realist reviews, available at:
https://www.ramesesproject.org/media/RS_qual_standards_researchers.pdf

PLANNED DATA SYNTHESIS

Strategy for data synthesis

This review will follow realist logic underpinned by the school of Pawson and Tilley (Pawson & Tilley, 1997). As outlined above, initial programme theories will be developed, then further refined, refuted or developed iteratively based on data within the selected literature. Following an assessment of relevance and rigour, proximal outcomes related to GDP or other DHP participation in publicly funded, contracted care will first be identified. Thereafter, a series CMOCs will be constructed to explain how proximal outcomes are produced when mechanisms are triggered in a specific context. The review will set out to discover what these contexts and mechanisms are and why outcomes occurred; for whom, under what circumstances and to what extent. CMOCs will be used to inform a final, refined programme theory (or theories) to explain patterns of causation leading to distal outcomes of interest.

Analysis of subgroups or subsets

None planned

REVIEW AFFILIATION, FUNDING AND PEER REVIEW

Review team members

- Dr Paul Leavy, Trinity College Dublin, The University of Dublin
- Mr David Mockler, Trinity College Dublin, The University of Dublin
- Dr Padraic Fleming, Trinity College Dublin, The University of Dublin

Review affiliation
Trinity College Dublin, The University of Dublin

Funding source
Research funded by the Health Research Board SPHeRE 2018-1

Named contact
Paul Leavy. Centre for Health Policy & Management, Trinity College Dublin, 3-4 Foster Place, Dublin 2, IRELAND
leavypa@tcd.ie

TIMELINE OF THE REVIEW

Review timeline
Start date: 05 December 2022. End date: 31 December 2023

Date of first submission to PROSPERO
03 April 2023

Date of registration in PROSPERO
14 April 2023

CURRENT REVIEW STAGE

Publication of review results
The intention is to publish the review once completed.The review will be published in English

Stage of the review at this submission

Review stage	Started	Completed
Pilot work		
Formal searching/study identification	✓	
Screening search results against inclusion criteria		
Data extraction or receipt of IP		
Risk of bias/quality assessment		
Data synthesis		

Review status
The review is currently planned or ongoing.

ADDITIONAL INFORMATION

Additional information

Collaborators

- **Dr Sarah Barry**, School of Population Health, Royal College of Surgeons in Ireland
- **Professor Paul Batchelor**, Faculty of Medicine, University of Central Lancashire

- **Dr Úna McAuliffe**, School of Public Health, University College Cork
- **Dr Will Rymer**, General Dental Practitioner, Roscrea, County Tipperary
- **Mr James Allen**, Department of Health (Ireland)
- **Ms Yvonne Howell**, School of Dental Science, Trinity College Dublin, The University of Dublin
- **Ms Fiona McKeown**, Health Service Executive (HSE) CHO 5
- **Ms Sophie Mulcahy Symmons**, School of Nursing, Midwifery and Health Systems, University College Dublin

PROSPERO version history

- Version 1.1 published on 14 Apr 2023
- Version 1.0 published on 14 Apr 2023

Review conflict of interest
None known

Country
Ireland

Other registration details
Not applicable

Medical Subject Headings
Dentists; Humans; Oral Health; Professional Role; United Nations; World Health Organization

Details of any existing review of the same topic by the same authors
None

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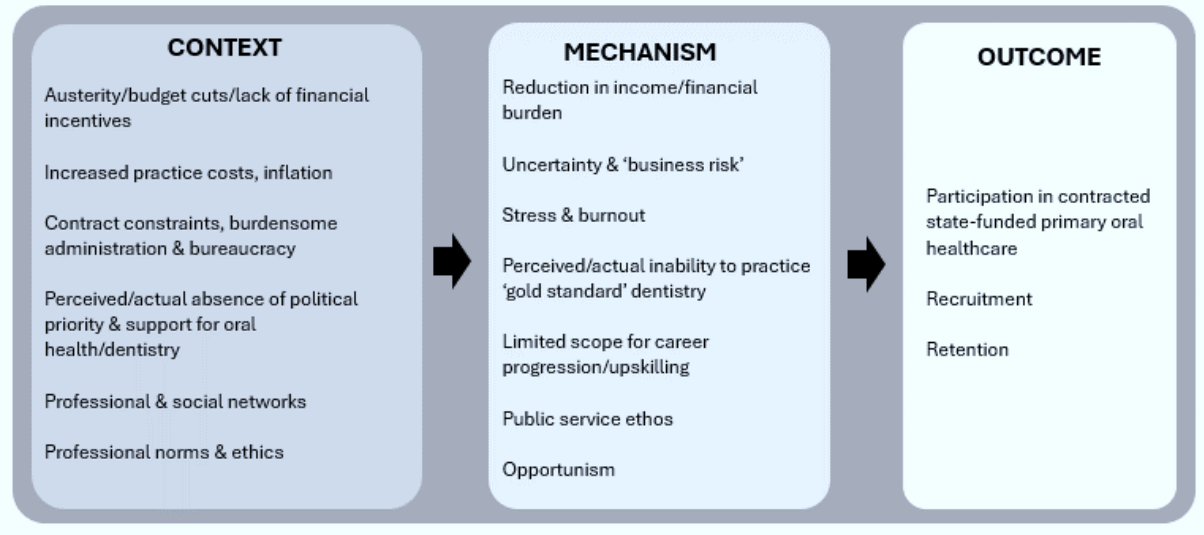
Any enquiries about the record should be referred to the named review contact

Appendix 3: Study 2: Realist Review Initial (Rough) Programme Theory



Appendix 4: Study 2: Realist Review *"If, then, because"* (ITB) statements

ITB 1: 'IF [public contracts restrict treatments GDPs can offer patients, for example, through limiting the number of service items, the use of certain dental materials or by imposing provisos] THEN [GDPs leave the public system in favour of other systems with fewer constraints, e.g., fully private care] BECAUSE [they feel public contracts impede their clinical autonomy & their perceived ability to offer care that is considered patient-centred & best practice]'

ITB 2: 'IF [public contracts are designed to contain costs (to the exchequer) through the use of clinical targets & capped payments] THEN [GDPs may experience stress, burnout & therefore resign from their public contracts in favour of practising in the private sector or salaried services] BECAUSE [they come under pressure & feel unable to treat a high volume of patients within a specific timeframe in order to meet targets & receive payment]'

ITB 3: 'IF [public contracts remunerate at levels which GDPs perceive as being low and not commensurate with their skill sets or qualifications] THEN [GDPs leave these contracts in favour of private-only work] BECAUSE [they perceive a message that they are of little value or worth in the public contract]'

Appendix 5: Study 2: Realist Review systematic literature search strategies

EMBASE:

('dentist'/exp OR 'dentistry'/exp OR 'dental personnel'/exp) AND ('career'/exp OR 'career planning'/exp OR 'decision making'/de)

(Dental NEAR/2 (practitioner* OR specialist* OR nurse* OR therapist* OR hygienist* OR professional* OR career*) NEAR/9 (participat* OR work* OR employ* OR engag* OR career* OR recruit* OR work*)):ti,ab,kw

(dentist* NEAR/3 (participat* OR work* OR employ* OR engag* OR career* OR recruit* OR work*)):ti,ab,kw

#1 OR #2 OR #3

'public health service'/exp OR 'public health'/exp

(Medicaid OR 'Childrens Health Insurance Program'):ti,ab,kw

((public OR 'public care') NEAR/3 (dentist* OR dental OR 'health insurance' OR health OR insurance OR provider* OR 'dental service' OR 'dental benefit program*' OR 'health practice' OR 'dental clinic*' OR sector OR practic* OR practis* OR system)):ti,ab,kw

(subsidi* OR (state NEAR/3 finance*)):ti,ab,kw

#5 OR #6 OR #7 OR #8

'private practice'/exp

(privat* NEAR/3 (dentist* OR dental OR 'health insurance' OR health OR insurance OR provider* OR 'Dental Service' OR 'dental benefit program*' OR 'health practice' OR 'dental clinic*' OR sector OR system OR practic* OR practis*)):ti,ab,kw

#10 OR #11

((Workforce* OR personnel OR future) NEAR/3 (plan* OR model*)):ti,ab,kw

#4 AND (#9 OR #12) [1064]

#4 AND #13 [113]

Medline (OVID):

(exp Dental Staff/ OR exp Dentists/ OR exp Dentistry/) AND (Employment/ OR Career Choice/ OR Decision Making/)

(Dental adj2 (practitioner* OR specialist* OR nurse* OR therapist* OR hygienist* OR professional* OR career*) adj9 (participat* OR work* OR employ* OR engag* OR career* OR recruit* OR work*)).ti,ab.

(dentist* adj3 (participat* OR work* OR employ* OR engag* OR career* OR recruit* OR work*)).ti,ab.

1 OR 2 OR 3

Public Health/ OR Public Health Practice/ OR exp Public Health Dentistry/

(Medicaid OR Childrens Health Insurance Program).ti,ab.

((public OR public care) adj3 (dentist* OR dental OR health insurance OR health OR insurance OR provider* OR dental service OR dental benefit program* OR health practice OR dental clinic* OR sector OR practic* OR practis* OR system)).ti,ab.

(subsidi* OR (state adj3 finance*)).ti,ab.

5 OR 6 OR 7 OR 8

exp Private Practice/

(privat* adj3 (dentist* OR dental OR health insurance OR health OR insurance OR provider* OR Dental Service OR dental benefit program* OR health practice OR dental clinic* OR sector OR system OR practic* OR practis*)).ti,ab.

10 OR 11

((Workforce* OR personnel OR future) adj3 (plan* OR model*)).ti,ab.

4 AND (9 OR 12) [1295]

4 AND 13 [98]

Web of Science:

(Dental NEAR/2 (practitioner* OR specialist* OR nurse* OR therapist* OR hygienist* OR professional* OR career*) NEAR/9 (participat* OR work* OR employ* OR engag* OR career* OR recruit* OR work*)) OR (dentist* NEAR/3 (participat* OR work* OR employ* OR engag* OR career* OR recruit* OR work*))

(Medicaid OR "Childrens Health Insurance Program") OR ((public OR "public care") NEAR/3 (dentist* OR dental OR "health insurance" OR health OR insurance OR provider* OR "dental service" OR "dental benefit program*" OR "health practice" OR "dental clinic*" OR sector OR practic* OR practis* OR system)) OR (subsidi* OR (state NEAR/3 finance*))

(privat* NEAR/3 (dentist* OR dental OR "health insurance" OR health OR insurance OR provider* OR "Dental Service" OR "dental benefit program*" OR "health practice" OR "dental clinic*" OR sector OR system OR practic* OR practis*))

((Workforce* OR personnel OR future) NEAR/3 (plan* OR model*))

#1 AND (#2 OR #3) [716]

#1 AND #4 [63]

Google Scholar:

Dentist | "dental professional" "career AROUND(3) choice | preference | plan | planning | intention | motivation" public | private

Dentist "Workforce | personnel | career AROUND(3) plan | planning | model | models | modelling" private | public | state

"Dentist AROUND(6) career | employment |work | job" choice | choose | select | opt public | private

logic model" | "theory of change" | "theory of action" | "outcomes chain" | "program* theory"| "program* logic" | "logical framework" Dentist | "dental professional" "career AROUND(3) choice | preference | plan | planning | intention | motivation"

Appendix 6: Study 2: Realist Review study selection criteria

Inclusion	Exclusion
Reporting on participation of dentists in publicly funded, contracted primary dental care schemes or services. and/or: Health system factors, as defined in the World Health Organization (WHO) Health Systems Framework, for example, health service delivery, workforce, financing, leadership and governance. Reporting on the OECD geographical area. Written in English.	Reporting exclusively on dentists practising public or community (salaried) primary dental care services or non-primary care settings (e.g., hospital dental services). Reporting exclusively on professionals other than dentists, e.g., dental hygienists, dental nurses. Focussing on provision of private dental care only with no consideration for subsequent impact on dentist participation in publicly funded, contracted primary dental care. Reporting on jurisdictions out with the OECD. Written in a language other than English.

Appendix 7: Study two: Realist Review summary of included studies and sources (in order of citation)

Authors	Year	Title	Category	Country or geographical focus
Winkelmann et al.	2022	Oral health care in Europe: Financing, access and provision	Grey literature	Europe
Woods et al.	2017	The healthcare system and the provision of oral healthcare in European Union member states. Part 7: Republic of Ireland	Published article	Ireland
Williams et al.	2023	Bold action or slow decay? The state of NHS dentistry and future policy actions	Grey literature	United Kingdom (England)
OECD	2015	Fiscal Sustainability of Health Systems: Bridging Health and Finance Perspectives	Grey literature	OECD
Fleming et al.	2023	How International Health System Austerity Responses to the 2008 Financial Crisis Impacted Health System and Workforce Resilience – A Realist Review	Published article	Global (mostly Europe and others internationally)
Watt et al.	2019	Ending the neglect of global oral health: time for radical action	Published article	Global perspective
House of Commons Health and Social Care Committee	2023	NHS dentistry: Ninth Report of Session 2022–23	Grey literature	United Kingdom (England)
Barrow et al.	2023	The Political Environment of Global Oral Health: Now is the Moment to Improve Equity	Published article	Global perspective
Benzian et al.	2011	Political priority of global oral health: an analysis of reasons for international neglect	Published article	Global perspective
McAuliffe et al	2022	'Toothless'—the absence of political priority for oral health: a case study of Ireland 1994–2021	Published article	Ireland
HSE Primary Care Reimbursement Service	2022	Circular No.13/22	Grey literature	Ireland

Department of Social Protection	2023	Treatment Benefit Scheme (website)	Grey literature	Ireland
Brocklehurst et al.	2016	Determining the optimal model for role substitution in NHS dental services in the UK: a mixed-methods study	Published article	United Kingdom
legislation.gov.uk	2010	The National Health Service (General Dental Services) (Scotland) Regulations 2010	Grey literature	United Kingdom (Scotland)
Allen et al.	2020	Dentists' perceptions of their professional roles regarding referrals within primary dental care in England: a qualitative study	Published article	United Kingdom (England)
Baird et al.	2007	Perspectives of dentists in primary care ahead of the 'new ways of working'	Published article	United Kingdom (England)
Steele et al.	2009	NHS dental services in England. An independent review led by Professor Jimmy Steele	Grey literature	United Kingdom (England)
Gallagher et al.	2009	A question of value: a qualitative study of vocational dental practitioners' views on oral healthcare systems and their future careers	Published article	United Kingdom (England and Wales)
Gallagher et al.	2021	Supporting dentists' health and wellbeing - workforce assets under stress: a qualitative study in England	Published article	United Kingdom (England)
Houses of the Oireachtas	2024	Challenges Relating to the Provision of Dentistry Services: Discussion	Grey literature	Ireland
Thomson et al.	2021	Factors influencing dental trainees' choice of training programme and working patterns: a mixed-methods study	Published article	United Kingdom (England)
Taylor-Gooby et al	2000	Knights, knaves and gnashers: Professional values and private dentistry	Published article	United Kingdom (England)
McDonald et al.	2012	Changes to financial incentives in English dentistry 2006-2009: a qualitative study.	Published article	United Kingdom (England)

Burford et al.	2023	The Dental Workforce in the North East: Results of a survey and workshop - September 2023	Grey literature	United Kingdom (England)
Calnan et al.	2000	Doing business in the NHS: exploring dentists' decisions to practise in the public and private sectors	Published article	United Kingdom (England)
Murray	2002	Better opportunities for women dentists: a review of the contribution of women dentists to the workforce	Published article	United Kingdom (England)
O'Selmo et al.	2019	Dental associates' perceptions of their working environment: a qualitative study	Published article	United Kingdom
Willett and Palmer	2009	An investigation of the attitudes and fears of vocational dental practitioners in England and Wales in 2007	Published article	United Kingdom (England and Wales)
Burford and Vance	2022	The Dental Workforce in Cumbria: Results of a survey and workshop October 2022	Grey literature	United Kingdom (England)
Harris et al.	2011	The impact of changes in incentives and governance on the motivation of dental practitioners	Published article	United Kingdom (England)
Harris et al.	2015	Contracting with General Dental Services: a mixed-methods study on factors influencing responses to contracts in English general dental practice	Published article	United Kingdom (England)
Hill et al.	2010	Dental practitioners and ill health retirement: a qualitative investigation into the causes and effects	Published article	United Kingdom
O'Selmo et al.	2018	Associates and their working environment: a comparison of corporate and non-corporate associates	Published article	United Kingdom (England)
Toon et al.	2019	An analysis of stress and burnout in UK general dental practitioners: subdimensions and causes	Published article	United Kingdom
Denton et al.	2008	Occupational burnout and work engagement: a national survey of dentists in the United Kingdom	Published article	United Kingdom

National Audit Office	2011	Delivering efficiency savings in the NHS: Briefing for The House of Commons Health Committee September 2011	Grey literature	United Kingdom (England)
Brocklehurst et al.	2020	Impact of changing provider remuneration on NHS general dental practitioner services in Northern Ireland: a mixed-methods study	Published article	United Kingdom (Northern Ireland)
HSE Primary Care Reimbursement Service	2022	Primary Care Reimbursement Service Information and Administrative Arrangements for Dentists V02	Grey literature	Ireland
NHS National Services Scotland	2023	Prior Approval Team (website)	Grey literature	United Kingdom (Scotland)
Holmes et al.	2015	Learning from contract change in primary care dentistry: A qualitative study of stakeholders in the north of England	Published article	United Kingdom (England)
Vernazza et al.	2019	How does priority setting for resource allocation happen in commissioning dental services in a nationally led, regionally delivered system: a qualitative study using semi structured interviews with NHS England dental commissioners	Published article	United Kingdom (England)
Gallagher et al.	2021	Supporting dentists' health and wellbeing - a qualitative study of coping strategies in 'normal times'	Published article	United Kingdom (England)
Harris and Holt	2013	Interacting institutional logics in general dental practice	Published article	United Kingdom (England)
Reynolds et al.	2019	Member and dentist narratives about a dental programme for the Medicaid expansion population: A content analysis	Published article	United States
Collin et al.	2019	A survey of stress, burnout and well-being in UK dentists	Published article	United Kingdom
House of Commons Health Committee	2008	Dental Services: Fifth Report of Session 2007–08	Grey literature	United Kingdom (England)

Irish Dental Association	2021	Presentation to Oireachtas Joint Committee on Health regarding dental care for medical card patients	Grey literature	Ireland
Dharamsi et al.	2007	How dentists account for social responsibility: economic imperatives and professional obligations	Published article	United States and Canada
Balasubramanian et al.	2019	A strife of interests: A qualitative study on the challenges facing oral health workforce policy and planning	Published article	Global (15 countries)
Johnston et al.	2020	Can people afford to pay for health care? New evidence on financial protection in Ireland	Grey literature	Ireland
Blinkhorn et al.	2008	English general dental practitioners' views on the new contract: The problems of collecting information in a time of change	Published article	United Kingdom (England)
Harris et al.	2015	A discourse of disconnection – challenges to clinical engagement and collaborative dental commissioning	Published article	United Kingdom (England)
Davies and MacFarlane	2010	Clinical decision making by dentists working in the NHS General Dental Services since April 2006	Published article	United Kingdom (England)
Holmes et al.	2009	Commissioning NHS dentistry in England: issues for decision-makers managing the new contract with finite resources	Published article	United Kingdom (England)
Batchelor	2009	NHS dental care and the issues of public service ethos, governance, accountability and probity	Grey literature	United Kingdom (England)
Goodwin et al.	2018	How, and why, does capitation affect general dental practitioners' behaviour? A rapid realist review	Published article	Global (UK, USA, Denmark, Turkey, South Africa)
Tickle et al.	2011	Paying for the wrong kind of performance? Financial incentives and behaviour changes in National Health Service dentistry 1992-2009	Published article	United Kingdom (England)
Reynolds et al.	2023	Dentist-reported differences in services provided to patients with public vs. private dental insurance	Published article	United States
Gallagher et al.	2007	Dentistry – a professional contained career in healthcare. A qualitative study of Vocational Dental Practitioners' professional expectations	Published article	United Kingdom (England and Wales)
Patel	2021	The 'Zoom Boom' effect on dentistry and facial aesthetics	Grey literature	Non-specific
Logan et al.	2015	Barriers to Medicaid Participation among Florida Dentists.	Published article	United States
Westgarth	2022	The public and patient perception of dentistry	Grey literature	United Kingdom

Appendix 8: Study 2: Realist review conceptual codes

Coding Framework Search Project

Name	Files	References
Bureaucracy and Admin Burden	4	8
Business vs social responsibility or PS ethos	5	15
Influence of associations	2	3
Career progression	1	3
Clinical freedom	3	4
Control	9	17
Autonomy vs social contract	1	2
Power struggle GDP vs 'Government'	5	24
De-skilling	1	1
Diplomacy	1	12
Fullfilling career	1	3
High needs patients	1	1
Honing clinical skills	1	2
Incentives	1	2
Influence of Other agents eg Associations	4	7
Less than full time	2	2
Limited time with patients	3	3
Litigation	1	2

Meeting clinical targets	3	9
Mental health	3	4
Stress and burnout	2	2
Politics	1	1
Portfolio career	1	1
Private market	5	10
Greater ability to offer patients more	1	1
Professional norms	2	2
Collective apathy	1	1
'Elitest' profession	1	1
Public service stigma among GDPs	3	4
Public sector pressures (clinical)	3	8
Public service ethos	6	11
Quality care	16	36
Remuneration and funding	12	22

'Survival'	4	11
Contract flexibility or bending the rule	2	6
'Gaming' the system	4	14
Increased outward referrals	1	1
Trust or Mistrust btwn Principal and agent	4	14
Value of dentistry	2	3
GDPs not feeling valued	1	1
Patients' valuing dentistry	3	5
The 'State' not valuing public dentistry	1	1

Drag selection here to code to a new node

Appendix 9: Study 2: Realist review individual CMOC statements

C = context, M = mechanism, O = outcome

1a. Suboptimal remuneration → public patients

"Where remuneration on public schemes (contracts) is perceived as being inadequate (C), GDPs avoid taking on new public patients (O) to maintain practice profitability and therefore remain practising within public schemes (O) because they perceive 'bending the rules' as a legitimate response to what they believe are unfair terms and conditions of service (M)."

"Where remuneration on public schemes (contracts) is perceived as being inadequate (C), GDPs will offload (refer) patients deemed to be financially unviable (O) to maintain practice profitability and therefore remain practising within public schemes (O) because they perceive 'bending the rules' as a legitimate response to what they believe are unfair terms and conditions of service (M)."

"Where remuneration on public schemes (contracts) is perceived as being inadequate (C), GDPs selectively chose new public patients they believe are low risk financially (O) to maintain practice profitability and therefore remain practising within public schemes (O) because they perceive 'bending the rules' as a legitimate response to what they believe are unfair terms and conditions of service (M)."

"Where remuneration on public schemes (contracts) remains unchanged for prolonged periods (C), GDPs avoid taking on new public patients (O) to maintain practice profitability and therefore remain practising within public schemes (O) because they perceive 'bending the rules' as a legitimate response to what they believe are unfair terms and conditions of service (M)."

"Where remuneration on public schemes (contracts) does not match private market rates for dental care (C), GDPs avoid taking on new public patients (O) to maintain practice profitability and therefore remain practising within public schemes (O) because they perceive 'bending the rules' as a legitimate response to what they believe are unfair terms and conditions of service (M)."

1b. Suboptimal remuneration → public treatments

"Where remuneration on public schemes (contracts) is perceived as being inadequate (C), GDPs carry out the minimum amount of treatment necessary for payment (O) to maintain practice profitability and therefore remain practising within public schemes (O) because they perceive

'bending the rules' as a legitimate response to what they believe are unfair terms and conditions of service (M)."

"Where remuneration on public schemes (contracts) is perceived as being inadequate (C), GDPs overtreat for maximum payment (O) to maintain practice profitability and therefore remain practising within public schemes (O) because they perceive 'bending the rules' as a legitimate response to what they believe are unfair terms and conditions of service (M)."

"Where remuneration on public schemes (contracts) is perceived as being inadequate (C), GDPs may withhold certain costly treatments (O) to maintain practice profitability and therefore remain practising within public schemes (O) because they perceive 'bending the rules' as a legitimate response to what they believe are unfair terms and conditions of service (M)."

2. Contract constraints → impact on quality care → frustration/job satisfaction

"When public contracts place limits on the types of treatments that GDPs can provide (C), GDPs become frustrated (O) because they lose faith in their ability to provide quality care to their patients (M)."

"When public contracts place limits on the types of treatments that GDPs can provide (C), GDPs become frustrated (O) because they perceive that it adversely affects their patients (M)."

"When public contracts place limits on the types of treatments that GDPs can provide (C), GDPs become frustrated (O) because they perceive that the quality of care they can deliver is compromised by pressures to see large volumes of patients (M)."

"When public contracts place limits on the types of treatments that GDPs can provide (C), GDPs become frustrated (O) because they find it difficult to take pride in their work (M)."

"When public contracts place limits on the types of treatments that GDPs can provide (C), GDPs become frustrated (O) because they feel they can't utilise their full skillsets (M)."

3. State 'control' → contract constraints → GDP autonomy → job satisfaction

"When public contracts (systems) impose restrictions on the type of care GDPs can deliver (C), they become demotivated (disengaged) (O) because they perceive outside forces ('the State') as controlling their business/eroding their clinical autonomy (M)."

"When public contracts (systems) impose restrictions on the type of care GDPs can deliver (C), they become frustrated (O) because they perceive outside forces ('the State') as controlling/eroding their clinical autonomy (M)."

"When public contracts (systems) impose restrictions on the type of care GDPs can deliver (C), they reduce their public commitment (O) because they perceive outside forces ('the State') as controlling/eroding their clinical autonomy (M)."

"When public contracts (systems) impose restrictions on the type of care GDPs can deliver (C), they become hostile towards the health service/health service managers (O) because they perceive outside forces ('the State') as controlling their business/eroding their clinical autonomy (M)."

"When public contracts (systems) impose targets or goals on GDPs (C), they become disengaged with the public system/become frustrated/reduce their public commitment/become hostile toward the health service/health service managers (O) because they perceive outside forces ('the State') as imposing terms and conditions which they view as unfair (M)."

"When public contracts (systems) impose targets or goals on GDPs (C), they become resentful of the public system/become frustrated/become hostile toward the health service/health service managers (O) because they perceive these targets as in conflict to their professional values or beliefs e.g., to deliver quality care (M)."

"When public contracts (systems) impose targets or goals on GDPs (C), they become resentful of the public system/become frustrated/become hostile toward the health service/health service managers (O) because this creates/fuels(?) intrinsic conflict between GDPs professional self-interest (entrepreneurialism) and altruistic motives (M)."

"When public contracts (systems) impose targets or goals on GDPs (C), they are less likely to co-operate with health service managers in the delivery of state care (O) because of pressures imposed on them and perceived 'unfriendliness' (M)."

4. Absence or lack of 'value' on state oral healthcare

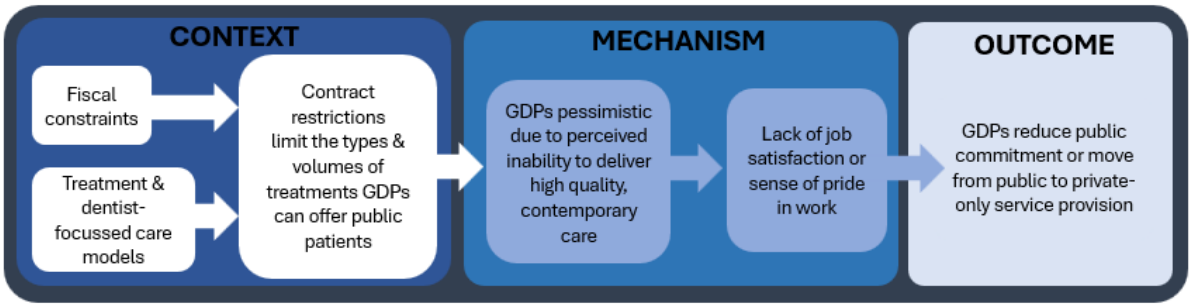
"When patients pay no or significantly reduced fees (compared to private care) on public dental schemes/services (and their expectations of care are high) (C), GDPs feel disheartened or undervalued because they perceive that patients do not value them (or dental care) or appreciate the costs of delivering care (M), therefore they move from public to private care (O)."

"When patients pay no or significantly reduced fees (compared to private care) on public dental schemes/services and they do not engage with care, for example by not attending appointments (C), GDPs feel disheartened or undervalued because they perceive that patients do not value them (or dental care) or appreciate the costs of delivering care (M), therefore they move from public to private care (O)."

"When remuneration on public dental schemes/services is less than private care or when the government fails to invest/fund public dental care (C), GDPs feel disheartened or undervalued because they perceive that the Government does not value them/dental care (M), therefore they move from public to private care (O)."

Appendix 10: Study 2: Realist Review illustrative data used to construct study 1 consolidated CMOCs

CMOC 1: Quality care and job satisfaction



Supporting data:

The 2006 contract saw a radical change to NHS dental services in England: central budgets (which had not been cash limited) were capped, bringing dentistry in line with other parts of the NHS. The payment shifted from a fee-for-service model to one that required activity targets to be hit to maintain income levels (Williams et al., 2023).

Political and institutional factors can play a major role in promoting the intrinsic sustainability of health systems. These factors include: political agreement on the need to control health expenditure growth and on specific targets; effective co-ordination mechanisms among the different stakeholders; the degree of decentralisation of health services (in terms of functions and revenues); and the boundaries between public and private spending on health. While these supportive factors can be influenced in the medium to long term, they are more difficult to change in the short term, and their absence can be interpreted as risks to the fiscal sustainability of health systems.
The survey of budget practices in health shows that most countries have targets or ceilings for health spending over several years. These are determined by economic rather than health-specific factors. Nonetheless, over-spending in health (i.e. spending more than the budgeted amount) remains endemic in many OECD countries (OECD, 2015).

In the aftermath of the financial crisis, some countries were more burdened by the restrictive fiscal policies that followed, for example, Ireland, Greece, Spain and Portugal, where decision-making was increasingly influenced by outside agents. In the case of Ireland, at a national level the Health Service Executive became increasingly influenced by government including the Department of Health and the Department of Public Expenditure and Reform (Fleming et al., 2022a).

In high-income countries, the current treatment-dominated and increasingly technology-focused system of oral health care is trapped in an interventionist cycle failing to tackle the underlying causes of diseases and not meeting the needs of large proportions of the population (Watt et al., 2019).

When the new system was introduced, it was heavily criticised by dentists, patient groups and public health specialists alike. Common criticisms at the time included:
• the lack of piloting;
• UDA targets had been set at unrealistic levels;
• the new system failed to reduce dentists' workloads as claimed by the Government at the time;
• the financial consequences for new dentists who missed their contracted UDA target, including penalties for dentists who overdelivered on their contract, as well as underdelivered, who were required to pay back money given to them by their commissioners;
• the treatment bands were too wide;
• the system did not reward dentists who provide training; and
• there was no payment for delivering preventative services (House of Commons Health and Social Care Committee, 2023)

Although low-cost, realistic and scalable intervention packages exist, such as the World Health Organisation (WHO)-endorsed Basic Package of Oral Care, they have not gained sustained and widespread momentum, often because of professional's resistance to delegation and task shifting, and lack rigorous evaluation of implementation models (Benzian et al., 2011).

In terms of service coverage, there is a great deal of variation in the approaches countries use to define their benefit packages and how explicit these baskets are. They range from very detailed (positive) lists of all goods and services available through statutory coverage to a vaguely formulated and implicit benefit package with reference to broad categories of services including dental care. Benefit baskets can also be defined negatively by listing excluded services. For example, Italy and Spain use positive and negative lists and have a structured and detailed minimum benefit basket that can be further adapted by regional health authorities. Regarding dental care, most countries rely on implicit benefit packages which are then specified by exclusion of certain treatments (e.g. cosmetic treatments, fixed prothesis, implants, treatment of periodontal diseases), population groups (e.g. adults) and detailed requirements of cost-sharing for certain services and goods (co-insurance, deductibles, exemptions, etc.) (Winkelmann et al., 2022a).

Both schemes were among the first health budgets to face cuts and suffered severely because of austerity measures introduced in 2010 [12]. This described by an interviewee: "The state basically ditched large swaths of the dental profession…" (P8).Funding of the DTSS scheme was reduced from €62 to €10 million between 2010 and 2015 [20]. Dental benefits were limited to an examination and two emergency restorations with any other care subject to approval from the local HSE health manager. However, coverage was provided for unlimited dental extractions [12]. (McAuliffe et al., 2022)

A3A/A3C Restorations: The HSE now facilitates the introduction of composite restorations in the treatment of posterior teeth and will continue to reimburse up to and including two (2) restorations per calendar year (from Items A3A or A3C) per eligible person, where the contracting dentist is satisfied as to the clinical necessity (Health Service Executive, 2022).

Dental Benefit:
The department pays the full cost of an oral examination once a calendar year.
Since October 2017, a payment of €42 is provided towards either: a scale and polish; a periodontal treatment (if clinically necessary). If the cost of either cleaning or periodontal treatment is more than €42, you must pay the rest. This is capped at €15 for a scale and polish. There is no cap on the balance charged for periodontal treatment. You can get these treatments

from private dentists who are on the department's panel. Your dentist will check if you qualify for treatment. (Department of Social Protection, 2023b)

Large and abrupt changes in the provision of a number of treatments coincided with the introduction of the 2006 contract.13The number of complex treatments provided (root canal treatments, crowns and bridges) fell dramatically, whereas the number of extractions rose. This appeared to reflect an increase in those activities that were easier and less costly to perform at the expense of those treatments that were more time intensive or that incurred laboratory costs for crowns and bridges. The authors concluded that 'the change in treatment patterns suggests that significant numbers of dentists [were] attempting to hit their UDA contract targets in the most efficient way possible, i.e. shifting towards treatments where rewards are high relative to costs, as opposed to selecting on the basis of clinical factors (Brocklehurst et al., 2016).

Some participants felt unable to achieve high quality care for all, due to the perception of time constraints that were attributed to the GDS contract.
'…a more time-consuming patient costs the practice more money because of the time spent per appointment, and it's a shame that… you're not possibly remunerated to allow you to do that.' (GDP2) (Allen et al., 2020).

"Under the system you are not able to prescribe the best treatment for the patient's benefit." (Dentist at engagement event, Newcastle) (Steele, 2009).

…you can't spend hours doing necessarily the most ideal treatment for that patient. You have to compromise and you find yourself not necessarily doing the dentistry that you'd like to be able to do, but a combination of possibly what a patient wants and what NHS treatment you are able to give that patient…
And:
…in the NHS, everything you're doing, you feel like you're not doing it well enough because you haven't got the right materials. That just is awful and what's the point? I wouldn't want to work like that… (B-181) (Gallagher et al., 2009).

Their rationale for leaving NHS general practice included being able to practise in a way that was perceived as ethical, putting patients at the centre of care, taking time to provide explanations and ensure understanding, doing things once and well, conforming with standards laid down in educations and professional guidance (Gallagher et al., 2021).

I saw patients and offered them a level of care for which the service allows. Over the course of five, six or seven years, I saw the quality of their dentition deteriorate. I was providing a good standard of work but I was very limited as to how much care I could provide in a particular period. The patients I saw when I first arrived in Ireland now have missing teeth, dentures and heavily restored teeth. I would have liked to be able to offer a lot more (Houses of the Oireachtas, 2024a).

DFT2: 'Because it really affects us as well because we learnt all these things, weird and wonderful things at uni, and you can't do it because patients can't pay for it. And you think well'
And:
DFT2: 'A really good example is surgical extractions. I think a lot of associates in my practice, they just refuse to do them because they don't get paid for the time and that kind of stuff' (Thomson et al., 2021).

Limitations on quality of work were one of the central themes in the interview data, especially among those who had moved or were moving towards private dentistry:

‘Against a backdrop of fixed low fees it is impossible for many dentists to…achieve what they are looking for in the highest standard of care.’ (Mainly Private, AO)
I don’t think you can do it to a high standard on the NHS, you have to cut too many corners, there’s not the funding for it.’ (Mixed, AO)
‘You’ve got to use basically cheap, adequate basic materials – you can’t afford to use the latest innovative things.’ (Mainly NHS, AO) (Taylor-Gooby et al., 2000)

You see some people who have got absolutely superb dental work, A-one, top quality ….And you think, ‘Hmm, they must have been done privately,’ because we can’t spend all this time in NHS. [25R2 (provider)] (McDonald et al., 2012a).

FG1 P3: “[…] retention comes with variety and if you haven't got variety, you're struggling […It] goes back to changes in NHS practice as well because you go in and you're just doing amalgams or extractions, […] people don't want that anymore.” (Burford et al., 2023).

‘I was trying to do good dentistry, but I wasn’t making targets. So as far as the practice was concerned, I wasn’t necessarily a “good” dentist [implying not earning enough]. So, I did feel a little bit undervalued. I was feeling a bit [sic] low self-esteem, just generally miserable and often quite tired. I have had suicidal thoughts before, but […] never went near any risk of harming myself, so that was alright’ (M-GDP-Mixed[Int10]) (Gallagher et al., 2021)

…you can’t spend hours doing necessarily the most ideal treatment for that patient. You have to compromise and you find yourself not necessarily doing the dentistry that you’d like to be able to do, but a combination of possibly what a patient wants and what NHS treatment you are able to give that patient… (Gallagher et al., 2009)

[…] There are lots of cutting corners and I don’t think the practice was safe for patients or clinicians…I wasn’t happy to practise in that environment…I’ll give you a simple example which, basically, on my first day I had root canal treatment and they didn’t have a rubber dam kit. They said it’s a non-surgery practice. They have one rubber dam kit that gets used by the foundation trainee. I was like, “Well, I want that kit”. And I’m not happy to carry it out without a rubber dam (Gallagher et al., 2021)

Limitations on quality of work were one of the central themes in the interview data, especially among those who had moved or were moving towards private dentistry:
‘Against a backdrop of fixed low fees it is impossible for many dentists to…achieve what they are looking for in the highest standard of care.’ (Mainly Private, AO)
I don’t think you can do it to a high standard on the NHS, you have to cut too many corners, there’s not the funding for it.’ (Mixed, AO)
‘You’ve got to use basically cheap, adequate basic materials – you can’t afford to use the latest innovative things.’ (Mainly NHS, AO) (Taylor-Gooby et al., 2000)

“… [Under the new contract] I find it difficult to take pride in my work any more.” (Experienced NHS dentist, West Midlands) (Steele J, 2009)

“in the NHS, everything you’re doing, you feel like you’re not doing it well enough because you haven’t got the right materials. That just is awful and what’s the point? I wouldn’t want to work like that…”

“I get frustrated when I can’t do something but you know you can do something but because you’re limited by time and materials….If you had all the materials and time that you wanted, I think you’d really enjoy what you’re doing and get great satisfaction out of it.”

“Limitations on the types of treatments that they could provide in the NHS was considered frustrating, both in terms of not always being able to provide the best or most appropriate treatment for patients and not using all the skills that they had developed in training”

“Their rationale for leaving NHS general practice included being able to practise in a way that was perceived as ethical, putting patients at the centre of care, taking time to provide explanations and ensure understanding, doing things once and well, conforming with standards laid down in educations and professional guidance.”

“The finding that NHS practitioners are more likely to feel restricted in being able to deliver a quality care may explain why practitioners highly motivated by clinical aspects of the job are also those choosing to undertake work in the private sector.”

“Some practitioners, however, felt concerned when they felt unable to provide a good service for their patients, because of the pressures imposed by the healthcare system in which they worked.”

“It suggests that practitioners felt an erosion of professional autonomy had occurred with the introduction of activity targets, causing them to feel more restricted in their ability to provide quality care for their patients.”

“Many dentists described their reason for working hard, as being something which ‘came from within’. Working was something which was done for their own satisfaction. Enjoyment from work came from ‘being able to do my job well’ and ‘being able to get nice results’, and often, this meant that dentists were pulled towards work in the private sector. Being able to achieve a high standard of clinical excellence was one of the most rewarding aspects of work within a private practice, and rated above financial factors as a reward.

It’s not necessarily about the financial motivation it’s just the fact you’re doing as good as you can possibly do all the time and that is quite rewarding.”

“This appeared to be a trade-off between time with patients and workload expectations: less time and more patients being associated with quantity rather than quality treatment. …quality of care. I’m into that, so not just doing something quick and fast….That’s kinda what’s offered on the NHS sometimes.”

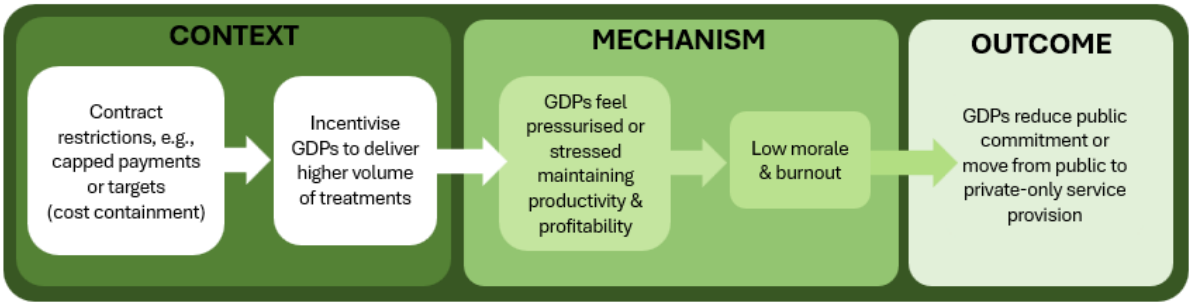
“they perceived that quality is not likely to be compromised by pressures to see and treat large numbers of patients in unrealistically short periods of time, leading to high levels of stress. More time with patients would mean that they did not have to perform rushed work and would give them greater opportunities to discuss treatment options with patients”

‘NHS dentistry is no longer providing the best treatment for patients, because the system will not pay for the best, and why should my patients receive second best.

The potential for boredom was considered by some VDPs to be greater in the NHS than private practice, given limitations in treatment types, leading to repetitive work. Goals such as becoming a dentist with a special interest (DwSI) or specialist were considered attractive. ...when you become a specialist in that field, you can explore it further, and that will make dentistry a lot more bright; basically, make it more interesting. (J-479) (Gallagher et al., 2009)

‘UDAs have made us feel cynical about the NHS. We all feel on a treadmill already. It is very difficult for us to get experience with complex cases with the UDA system (Willett and Palmer 2009)

CMOC 2: Pressure, demoralisation, and burnout



Most associate dentists reported working under tremendous pressure when delivering care and this was confirmed by others, including senior colleagues. They reported feeling thwarted by the highervolume targets that they had to achieve within a limited timeframe in order to meet practice and personal financial commitments, with punitive sanctions (clawbacks) where they failed to do so and ‘working for free’ should they ‘over-perform’. These were considered as major contributors to their demoralisation, demotivation, dissatisfaction and resulting stress, as outlined below: • ‘I think that’s a significant factor [...] that dentists within the current NHS contract have punitive penalties if they don’t hit their UDA target so they’re having to work faster and faster and faster and they’re being encouraged to deliver UDA-centred care so it’s all about the UDA, it’s not about the patient’ (M-GDP&T-Mixed&Acad[Int20])

• ‘[...] but I still find the stress of the UDAs and...the pressure on associates around me, made me realise that I don’t think I could do that long term as [...] my full-time job’ (F-DCT-HDS[Int18]). (Gallagher et al., 2021)

Challenges in meeting targets at practice level included the practice principal's inability to cover staff maternity leave, together with other pressures which lowered productivity, as shown by the following quotation from more than one principal dentist: • 'But my role as a principal I've got a target which is several different factors. If one dentist goes off on maternity leave and another dentist is [...] sick, or another dentist is performing poorly, and the target is not being reached, I can feel that pressure because [...] there are financial penalties to not achieving that' (M-PrincipalGDP-Mixed[Int13]).

One mid-career stage practitioner reported selling his practice because, although he supported his female dentists' periods of maternity leave, the pressure of managing the NHS contract and engaging appropriate levels of cover was a logistical nightmare and left him 'burnt out'. (Gallagher et al., 2021)

The sheer volume of work which the system dictated was something that several dentists described as being something which was difficult to cope with.

I used to be in a completely NHS practice and I was just chasing myself all the time. I could never clear the waiting room, always had people waiting and got a bit desperate with that really to be fair and probably would have given up if I'd have kept up with that situation. I hated it. Absolutely hated it. I honestly would have given up (dentistry). I was at that point [5]

'Well the stresses… well first of all trying to earn enough money to keep the wolves from the door and then you know building it up and secondly I was just working too hard I just had too many patients… I was seeing 50+ patients in one day… I was definitely on the dental treadmill.' (GDP [NHS])[6]

Some practitioners, however, felt concerned when they felt unable to provide a good service for their patients, because of the pressures imposed by the healthcare system in which they worked."

"The experience of work under this system was likened to 'factory work', with metaphors used such as 'drudgery' and the 'conveyor belt' to describe the system. As with a conveyor belt—there was no end in sight, and this was particularly depressing.

Your diary would just be booked up for months and months with the same stuff everyday and that to me was the treadmill… it was a bit groundhog day. No light at the end of the tunnel—as much as I enjoyed the patient interaction there was no real clinical job satisfaction so it was just volume drudgery and I knew I couldn't do that for the rest of my life—so that to me was the treadmill."

Well I'm more or less relieved when I've more or less achieved my stupid targets because that really would be the last straw really, if I didn't. Which is sad. Well, it's pointless. I mean, I don't know what the point of worrying is (laughs). It's not achieving anything other than trying to stay financially viable (Harris et al., 2015)

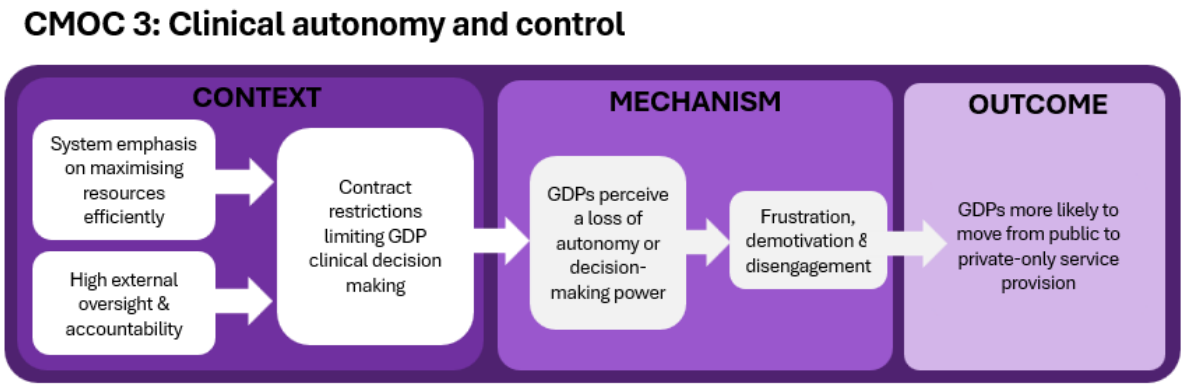
I think one thing I'll say about PCT managers, dog eat dog, they are responsible to their line . . . my PCT manager is responsible to A; A is responsible to B. And they have to do figures because if they don't do figures or their PCT don't do figures they get the rap from up and that's all they are bothered about in the same way I'm bothered about doing my UDAs and that's the problem with the whole system. If you don't do points then someone will rap on them and even at the top of the PCT, the CEO [chief executive officer], he's going to get it from the next level of management right up to the Minister for Health. OK, and that was the problem with the NHS, they are bothered about fulfilling their requirements whether it be points or . . . (Harris et al., 2015)

NHS treatment carries time pressures in work. Earnings among dentists are both lower and declining where they perform mainly NHS rather than private treatments (>75% NHS). One response to this situation is that practices will allocate shorter appointment times to NHS treatments compared to private treatment sessions to address costs and revenue concerns. We find support for the moderating effect of the NHS treatment in increasing the relationship between productivity stress and burnout. This suggests that time constraints are a significant source of stress in NHS dentistry. Additional factors that influence productivity stress come from outside surgery and are not easily controlled by the GDP. For example, practices may communicate expected throughput of work, both private and NHS, and seek to drive through these targets. Performance of NHS UDAs are agreed through a contract between the practice and local NHS in advance and practice owners may find themselves under pressure to deliver the required volume of UDAs by the end of year for fear of punitive contractual clawback. Collectively these external pressures are transmitted to the dentist and we observe that productivity stress drives burnout and we further find that a higher level of NHS work increases this effect (Toon et al., 2019)

All associates felt internal conflict, with a common sub-theme in NHS and mixed associates being governance. This covers the current NHS contract and the pressure to balance patient need and the units of dental activity (UDA) system. This professional versus business conflict showed divergence with corporate associates and their responsibility to the corporate, causing associates to be asked to upsell or push treatments they felt were inappropriate (O'Selmo et al., 2019)

There was a significant relationship between the proportion of the practitioner's time spent on NHS work and scores on the depersonalisation scale. Scores on the personal accomplishment scale were related to both hours worked and the proportion of time spent on NHS work. A lack of personal accomplishment was related to working long hours and a greater proportion of time spent working in NHS practice. Work engagement scores were related to four demographic variables. Higher levels of work engagement were found amongst dentists who had additional professional qualifications, worked longer hours and worked in large group practices. Spending a greater

proportion of time in NHS practice was associated with lower levels of work engagement.(Denton et al., 2008)



if you've got private, then you might control yourself again.... rather than somebody at the PCT saying, 'You ought to do this, because we've decided.' If you're private, then you can do what you want and what you think is best, rather than what someone else thinks is best [22 (provider)(McDonald et al., 2012).

'It [the new contract]... limits your prescription as a dentist... you're toeing the practice line and there is a certain budget for crown and bridge work in that practice... whereas if you're, if you have a private contract with the PCT then you can make that decision for yourself... it is severely limiting the way you operate and everyone operates differently, and they're trying to create a population of average dentists and there is no average dentist out there, every dentist works in a unique way to them.'[8]

I think, like most dentists, the appeal of GDS was the fact that you had the freedom to run your own practice and to treat the patients in the way that you saw fit. With GDS being item-of-service-based you could almost do your own prescription and collect your own charges within the framework of the NHS obviously.[5]

Particularly in the context of clinical decision-making, having a degree of autonomy was associated with the status of a 'professional'. Because you've got control clinically, it makes you more professional[5]

'It [the new contract]... limits your prescription as a dentist... you're toeing the practice line and there is a certain budget for crown and bridge work in that practice... whereas if you're, if you have a private contract with the PCT then you can make that decision for yourself... it is severely limiting the way you operate and everyone operates differently, and they're trying to create a population of

average dentists and there is no average dentist out there, every dentist works in a unique way to them.'(Baird et al., 2007)

The importance of independence and autonomy was a strong underlying theme throughout the interviews. Some felt that individualism and a strong desire for autonomy constituted a particular characteristic of individuals who chose to become dentists:

Independence is, has always been the big thing, anybody who owns their own practice, they do it for a reason. They all tend to be roughly out of the same sort of mould. They do it because they want the control for themselves (Changing Practice, Region S. 0277). The appeal of the private sector for many dentists, however, was less a reflection of the altruistic concerns for patient welfare than a concern to maintain or increase autonomy so that a sufficiently high level of technical care could be given to maintain job satisfaction (Calnan et al., 2000).

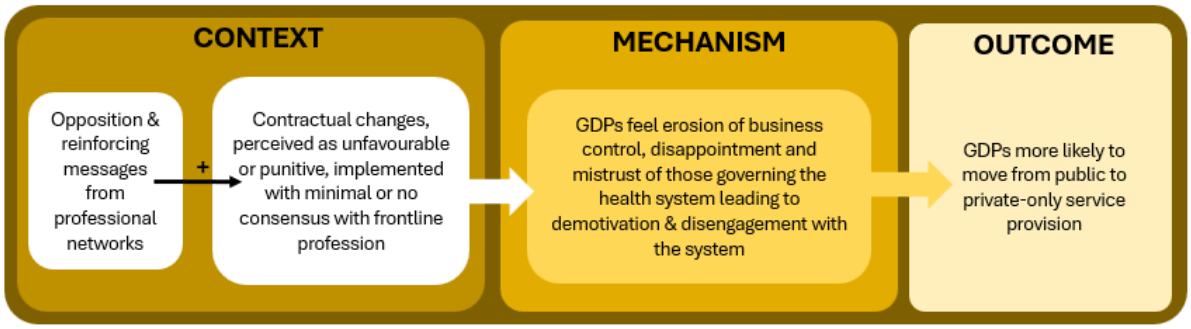
The ability to have freedom or autonomy of work was sought by the VDPs. Limitations on the types of treatments that they could provide in the NHS was considered frustrating, both in terms of not always being able to provide the best or most appropriate treatment for patients and not using all the skills that they had developed in training. Treatment flexibility is what's going to maximise my NHS contribution or minimise it—either way, really. (D-159) You have to compromise and you find yourself not necessarily doing the dentistry that you'd like to be able to do, but a combination of possibly what a patient wants and what the NHS treatment you are able to give that patient… (K-86) If you go into private, then at least you know you've got the clinical freedom to do things which you want. At least you know that you're not restricted to putting an amalgam on a lower six, which you know …for a fact would benefit from a composite rather than an amalgam. So maybe they should …increase clinical freedom in the NHS. (J-92) (Gallagher 2009).

…with private practice at least you've got your own say and do what you want to do but if you work under the NHS you're [still being] controlled by someone. (K-127)

…you're gonna lose control as well, aren't you? They're gonna be telling you how many patients you have to see… (J-128)

…I don't want to be pushed, so I like to do things at my own pace… (C-123) (Gallagher et al., 2009)

CMOC 4: Consensus, business control and trust



The change to a system with a greater degree of 'outside' control, was something which was painful, and a reason for some to move away from providing a service within the NHS.

The thing that hurts me the most is the fact that somebody else from outside is telling me what to do with my business. They're telling me which patients to see, how many I've got to see. They're telling me when I've got to see them, when I can take holiday—that just doesn't appeal. I was talking to one friend in particular last night and that's one of the reasons that you go down the private route. I'd rather take slightly less money and be private than have somebody telling me and having to be attached to somebody who doesn't really know the business[5]

We've got no control… we can't charge people for not turning up. We used to charge NHS patients for not turning up, and we had about 1.5, 2% failure rate. We've now got a 15, 20% failure rate….They want to tell us who we see, when we see them, the sort of patients we see and basically dictate to us what we do in our own businesses. …we've sunk half a million pounds into this business. It's our business. They want control of it. They now want to put the NHS logo outside if you've got a contract. I don't want my business to look cheap. I don't want an NHS logo outside. [8 (Provider)][7]

Participants also expressed that the current financial challenges were not being discussed openly and honestly. One suggested that it was a government strategy to push NHS dentists towards privatisation.

FG2 P4: "[…I would like the government] to be honest [about] what they want for NHS dentistry […] if they want it to just go to predominantly urgent care, then they should tell us that. […] They're making things so difficult for NHS practices to continue [they make it look like] it's us that want it to move [to private practice] when we're actually being forced.[9]

'I suspect whoever came up with them [regulations] tried to make them as ambiguous as possible (perhaps with the intention of tripping up providers when the day of judgement comes). As hard as I have tried I am sure I will have fallen foul of them. More concerning is that I

hear that 'errors' are not picked up as they occur and performers informed of mistakes, but they are allowed to continue, and accumulate, again to be answered for on judgement day'. (I30)[10]

The 1990 contract change was discussed and referred to mainly by those maintaining NHS practice and those changing practice. The survey data reinforces the evidence that the introduction of the new contract had increased the pressures experienced by NHS dentists. Those in the north and west region particularly felt that the change had been a significant factor in their decision to change their practice mix: 'I never used to do any private work at all, but when we had problems with the new contracts and the fee scale being cut … I decided then, enough was enough' (Changing Practice, NW). Those already practising mainly in the private sector were least affected. They tended to dismiss the new contract and continued as they were: 'The present contract is unworkable' (Mainly Private, NW).

The new contract was making demands … 24-hours, 7 days a week, 365 days a year which was unworkable … they reduced the fees for crown and bridge work … They started a capitation system for children, whereby you have to do everything for £3.90 a month … the whole thing was a nonsense. (Mainly Private, NW) (Taylor-Gooby et al., 2000)

The change to a system with a greater degree of 'outside' control, was something which was painful, and a reason for some to move away from providing a service within the NHS.

The thing that hurts me the most is the fact that somebody else from outside is telling me what to do with my business. They're telling me which patients to see, how many I've got to see. They're telling me when I've got to see them, when I can take holiday—that just doesn't appeal. I was talking to one friend in particular last night and that's one of the reasons that you go down the private route. I'd rather take slightly less money and be private than have somebody telling me and having to be attached to somebody who doesn't really know the business (Harris et al., 2011)

More generally, the contract was described as bringing dentists together as part of a common response of both opposition and fear, which may also contribute to the development and legitimation of a collective antipathy to NHS practice: We didn't used to have colleagues, we used to have competitors and it was very much everyone was in competition with everybody else.… Out of sheer terror it's brought people together, at least to kind of huddle together for safety, as it were [1(provider)] (McDonald et al, 2012).

However, the effort that organized dentistry made to keep out of the Canadian publicly funded health care system prompted the following query and angst: "Why did [dentistry] not get into Medicare? [Because] the dental profession went ballistic! They essentially torpedoed that recommendation of bringing dental care into Medicare. The Premier comes down to the Canadian Dental Association meeting and stands up and says that 'I'm here to announce that there will be no children's dental care program in this province,' and the audience stood up and applauded! We will applaud the fact that kids in the province will go neglected!" (C-DE) (Dharamsi et al., 2007)

Dentists generally view the new contract with suspicion and their subsequent experience is heavily influenced by the way their local PCT approaches their new responsibility.

“PCTs did not have the skills and experience to interact with dentists – they had expertise with GPs but it did not transfer. This is still a problem.” (Dentist at engagement event, Bristol) (Steele, 2009)

The fear (and reality) of “clawback” (money being clawed back by the PCT where a provider’s activity falls below target) is also a concern for many. Reliance on the UDA as the sole currency by which contract performance is judged and a formulaic approach to “clawback” lie at the heart of much of the dissatisfaction with the new system.

Of the many dentists we met, it was often the seemingly hard-working and committed NHS dentists who had a low UDA value and who refused to cut corners who felt worst done by, particularly when subjected to clawback (Steele, 2009)

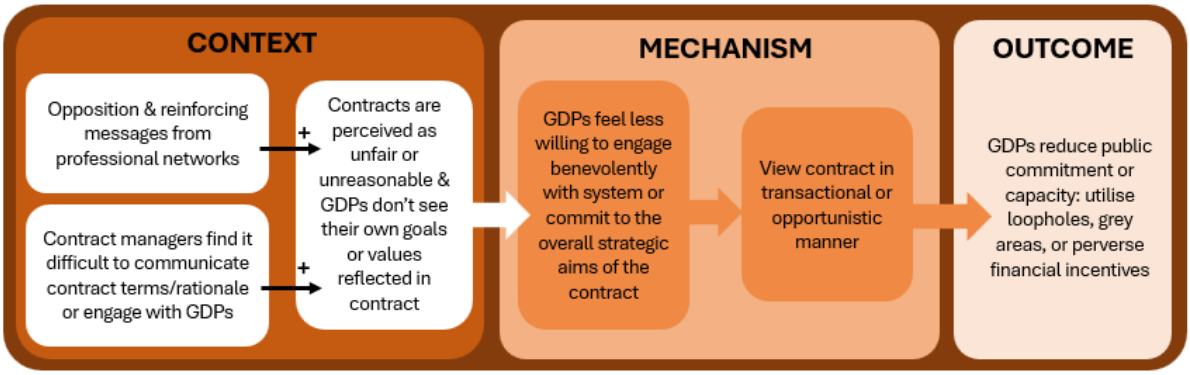
‘I suspect whoever came up with them [regulations] tried to make them as ambiguous as possible (perhaps with the intention of tripping up providers when the day of judgement comes). As hard as I have tried I am sure I will have fallen foul of them. More concerning is that I hear that ‘errors’ are not picked up as they occur and performers informed of mistakes, but they are allowed to continue, and accumulate, again to be answered for on judgement day’. (I30) (Harris 2015)

New patients were described as getting a ‘particularly poor deal’. The nGDS contract was felt to be ‘grossly unfair’ on dentists treating high numbers of new patients and it was agreed that starting a new list was difficult, especially in areas where disease levels and patients failing to attend appointments may be higher. Many practices wanted to avoid taking new patients as they represent an unknown liability that may saddle the business with a substantial loss once the responsibility to treat the patient has been accepted. Several interviewees expressed regret at this, feeling that they have ‘to be ruthless for the sake of their business but feel sorry for the patients’ who were unable to access care (Davies et al., 2010)

The discourse exhibited in the narratives is one of vulnerability and chastisement embedded

within a superior-subordinate relationship: ‘After recent claw-back meeting I really felt like a silly little girl, not a 46-year-old business-owning dental professional’. (III3) (Harris et al., 2015)

CMOC 5: Transactionality and opportunism



Additionally, the replacement of some 400 fees for individual treatment items, with three UDAs bands, creates incentives to shift to treatments where rewards relative to effort are high. In some cases, dentists reported referring patients to hospital rather than treat them at a loss. This would at least enable the tooth to be saved.

molar root treatments....you get three UDAs for them, and you could be spending two hours trying to get all the nerve out and root filled..... that's just not financially viable to do that, so we send them over to the dental hospital, but there's the waiting list. [21 (provider)] (McDonald et al., 2012)

However, dentists also freely admitted to taking advantage of the perverse incentives afforded by the new system and removing the tooth rather than spending time and effort to preserve it.

a molar root canal treatment done to the standard that we're supposed to work to would normally take about an hour and a half of treatment time. And I could take the tooth out and get the same number of UDAs. Which do you think we would suggest...? Both will achieve the same result. Both will get the patient out of pain. [21 (provider)] (McDonald et al., 2012)

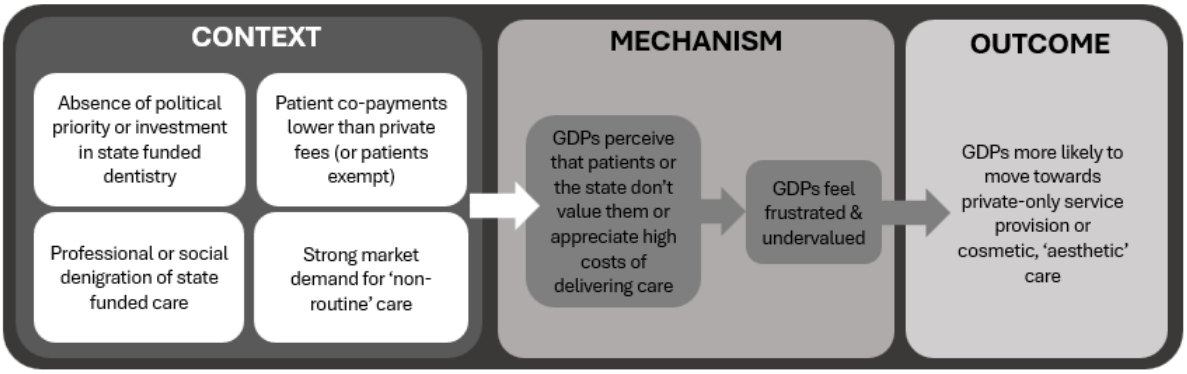
Working within the national healthcare system was seen as a framework of rules, within which the practitioners were free to devise ways of running their practice in order to maximize the service to patients and at the same time maximizing profit. One dentist described his practice as 'tailored' to the system. (Harris et al., 2011)

McRae (2005) argues the public-sector ethos involves people trying to do things well in areas that could not be carried out by the private sector. He went on to add "(the) public sector has aped the private sector without understanding that you have to do this thoughtfully

and carefully". He stated that individuals who work in the public sector, when faced with the danger of being set inappropriate targets and incentives, would become cynical and "will tick the

boxes and meet their targets because that is what their political masters require them to do". This would appear to be an all too common failing within the NHS (Batchelor, 2009)

CMOC 6: Value of state funded dental care



"The largest problem I see is patients do not value what they are receiving from DWP (or [Medicaid] for that matter). Patients love that they are getting FREE dentistry. It's FREE. They have no idea that there is a cost of doing business and we are writing off $X on each procedure. They don't really seem to care."[12]

'[...] patients really undervalue dentistry and I think you know they'll pick up a bill for dentistry and they'll be like wow that's a lot of money and then the dental profession look at it and think that's barely anything considering what we're doing. So, there's quite a large disparity between what a lot of people I think are willing to pay for dentistry and what a lot of dentists consider as reasonable, so I think there's a pretty big gap to bridge, I don't know the best way of doing that either, that's pretty tricky' (M-DFT-GDS[Int9]).[13]

A number of the VDPs said that they felt that the dental profession was undervalued and that dentists were not treated with the same level of respect and regard as peers in other professions. They felt that many people saw dentists as 'money-grabbing' rather than caring and did not see the value of dentistry. Furthermore, the VDPs felt that people did not understand the high costs involved in dentistry and that, in general, it provided value for money. This was particularly the case with NHS dentistry. ...the patients think of us as money-grabbers. They don't think of us as doing good for them. Sometimes they just think, 'Oh, you're just here to take our money' which is sometimes quite disheartening when you think, 'Oh, we're here to help you'. (K-168)[1]

I think it's unfair for the government . . . to basically absolve themselves of the responsibility and shift the burden to the providers, and say . . . that you will assume the social responsibility of providing care for people [in need]. . . . Should the dentist essentially subsidize the rest of the government and the entire population by providing this service at a lower, reduced fee?[14]

“NHS dentistry has always been a bit of a side show to the rest of the NHS.” (Participant at engagement event, Birmingham)[4]

Appendix 11: Study 3: Realist Interview Study ethics application

Applicant & Collaborators

Applicant Details

- Applicant Name : Paul Leavy

- Is applicant applying as a member of staff or a student? : Student

- School / Department : Research Institutes/Centres-non Faculty - Centre for Health Policy and Management

- Role on the Project : Principal Investigator

- Primary Employer (if not TCD) :

- Other affiliations (if applicable) :

- Course (for student applicant only) : PhD

- Part time / full time : Full-Time

- I have read and understood Trinity policy on Good Research Practice : Yes

- I have read and completed the Integrity module : Yes

- I have read and completed the Data Protection Training module within the last 24 months : Yes

Trinity Collaborators

User	Role
Sara Burke	Primary Supervisor
BLANAID Daly	Trinity Co supervisor

Other Collaborators

Name	Email Address	User
John Ford	j.a.ford@qmul.ac.uk	

Project Details

Main Project Details

- Title of research :How and why do health systems factors impact on private general dentists' participation in state funded dental care in Ireland: a realist evaluation

- Data Collection Start Date : 01/10/2024

- Data Collection End Date : 01/12/2024

- Project End Date : 01/10/2025 12:00:00 AM

- Does the research involve :Humans (or their data)

- Does this Animal research involve :

- Is this AREC research a first application or an amendment :

- Is the research WHOLLY (i) an analysis of statutes/legal provisions AND/OR (ii) legal judgments/cases which have been made public by a judicial process? : No

- Trinity Researchers will have access ONLY to aggregate data or data that otherwise fall outside of the remit of the GDPR. : No

- Could the research have detrimental legal, economic or social consequences for either the participant or their establishments : No

- Intentions of the research: Does the research : None of the above

- State research aim(s) and objective(s), research question or hypothesis : Project aim: To explain health system factors that have influenced private general dental practitioners (GDPs) decisions to participate as contractors/subcontractors or not in state funded primary oral healthcare services in Ireland, and to identify what factors will influence their participation in reformed services as proposed in Smile agus Slainte - National Oral Health Policy (2019).

- Lay Summary: including background/ rationale/ justification, research approach, study design (exclude detail of measurement instruments and intervention and analysis (if applicable) (Word limit: 250 words) : Ireland's National Oral Health Policy (NOHP) proposes reform of state-funded HSE dental services with care for children and medical card (MC) holders being commissioned to private general dental practitioners (GDPs). Recent years have seen the number of GDPs participating in the MC scheme (DTSS) decline, resulting in restricted access to care and widening inequities. This current workforce crisis isn't unique to Ireland or dentistry. It is symptomatic of wider health system problems. In this context, understanding system drivers and how they influence the system to deliver services can help bridge policy implementation gaps. This study seeks to understand what health system factors have influenced private GDPs decisions to participate in state funded, contracted primary oral healthcare services in Ireland to date, and what factors will influence their participation in reformed services as proposed in the NOHP. In this study, we will use realist evaluation, a theory-driven approach well-suited for analysing complex topics. It will build on a subset of findings from a realist review of the international literature (completed August 2024). In contrast to the review, this study focuses on Ireland only, and will use primary data captured via interviews. Realist evaluations are theory-driven, that is, where the purported causal mechanisms that lead to outcomes of interest in a given context are theorised by the research team.

- Identify all countries where data is collected or processed : IE

- Does the project involve :Human participants and /or their data and no biological samples

- Is the project funded : Yes

Details on Human Participants and their Data

- Does your research involve Mixed Methods : No

- Does the project use data from :Primary sources only

- Will you obtain Consent from participants (or in the case of children or adults at risk of vulnerability from a parent / legal guardian) for their participation and/ or the use of their data? : Yes

- Provide further information :

- Will payment be made to research participants? :No

- Provide further information :

- Is the research Health Research as defined in the Health Research Regulations? : Yes

- Does the research require a Consent Declaration form as defined by the Health Research Regulations 2018 and amendments 2021? : NO

- Which of the following best describes the research Secondary Data Source(s)? :

- Could any of the research data directly identify any participant? : No

- Could any of the research data indirectly identify any participant? :Yes

- Do you process Personal Data for study administration purposes? e.g. contacting individuals : Yes

- If yes please outline how you will store the information, keep it confidential, and destroy it in line with the data retention policy. : Personal data will be anonymised (e.g., names replaced with codes) and collated in an electronic master spreadsheet (Microsoft Excel) and stored on TCD's cloud-based storage (Microsoft 365) and be password protected. Codes will link participants to interview transcripts. A TCD-issued laptop will be utilised for M365 access at all times. In the event that data are required to be stored (e.g., temporarily) on this laptop, the repository will be encrypted and password protected. Audio recordings of interviews will be retained until transcribed before being deleted. As this research is funded by the Health Research Board and as per its policies, any research data used for publications must be made available to other researchers at time of publication. Any additional records needed to support or validate the projects findings or outputs must be made available. The HRBs policy also states that data should be retained for 10 years with any links between participants and personal data deleted thereafter.

- Which of the following best describes the general characteristics of the target population? :Adults currently not at risk of vulnerability

- Do any of the following further describe the characteristics of the target population? : Other

- Please describe : Participants to be recruited will include those working clinically in or having expertise or non-clinical experience in state funded, contracted primary oral healthcare services in the Republic of Ireland, namely; the DTSS (MC Scheme) and DTBS (PRSI scheme). The target population includes frontline clinicians, their professional representatives, dental public health specialists, health service managers and leaders, civil servants, politicians or political advisors or other relevant experts in the field of primary oral healthcare in Ireland.

- List the inclusion/ exclusion criteria for selection of research participants : Participants working or having experience in state funded, contracted primary oral healthcare services in the Republic of Ireland. These may include: frontline clinicians (general dental practitioners), their professional representatives, dental public health specialists, health service managers and leaders, civil servants, politicians or political advisors or other relevant experts in the field of primary oral healthcare in Ireland. Excluded populations will include those who do not work in the oral healthcare system in Ireland or wider professional, academic or political ecosystem as outlined above.

Research Sources and Sites

No data available in this section.

Outline of research methods

No data available in this section.

- Does your research use any of the following methods exclusively? : No

- Does the research include an intervention? : No

- Please select which of the following best describes the intervention :

- Other :

- Outline the intervention :

- Outline the method of analysis (Word limit :100 words) : Data from interviews will be transcribed verbatim and coded using NVIVO qualitative synthesis software (inductively and deductively). Concepts will be identified from transcripts and thereafter will be labelled as related to 'context', 'mechanism' or 'outcome' in line with realist methodology (Pawson and Tilley, 1997). Thereafter, the data will utilised to construct 'context'-'mechanism'-'outcome' configurations (CMOCs) which are the building blocks of realist research and used to explain how and why certain phenomena occur and to build programme theory. CMOCs will be refined as appropriate and finally consolidated to create and over-arching 'Final/Refined Programme Theory to explain causation.

- What is the approximate size of the target population? : 3000

- What is the proposed sample size -how many participants are involved in the study? : 15-20

- What is the justification for the sample size? : The Irish oral healthcare workforce- namely dentists is relatively small. The 'non-practising'/'non-clinical' community (policymakers, health services managers, academics) is even smaller. It is anticipated that 15-20 interviews would provide sufficient insights (and information saturation) into the Irish oral healthcare system of contracted dental care and wider policy context. Other realist evaluations have utilised similar sample sizes, e.g., Siersbaek et al., 2023.

Risk

Risk , benefit, harm to researcher

- What setting/s will be used for data collection : Online, Place of convenience for participants

- Other elaborate :

No data available in this section.

Risk , benefit, harm to site environment or Society

No data available in this section.

Risk , benefit, harm to participants

- Do you or any of the research team have any dependant relationship to the participants? : : No

- Detail the role of the researcher/s, the relationship of the researcher/s to the participants normally, and how you will mitigate against coercion of participants to participate in the research or in influencing their responses :

No data available in this section.

Participant Benefits

- Is it foreseeable that participants could potentially reveal information that you have a legal obligation to disclose (e.g. child protection policy, malpractice, etc.) :No

- What information may be disclosed, why, and to whom. :

- Outline any direct benefits to research participants of participation : None

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Conflict of Interest

- Are you aware of any Conflict of Interest from the PI or any collaborator, processor or other person involved in the conduct of the project, that could arise in the course of the project? : No

- Give details of the Conflict of Interest and what mitigation measures are in place :

Health Research

Health Related

- Please indicate which of the following apply to your Health Research project : Explicit consent will be obtained

- Is the PI a medical doctor / dentist covered by the state claims agency (SCA) Clinical Indemnity Scheme (CIS) for research conducted within a designated state authority (HSE hospital or Service Provider) : No

- Will the project involve the administration of any substances or require participants to refrain from taking any substance : No

- Please detail substance, amount, desired effect, possible side effects and measures for minimising risk. :

- Will there be ongoing clinical supervision of the participants by a duly insured clinical practitioner during the project : No

- Will the research participant's GP be informed that they are taking part in the project : No

- Will permission be sought from the research participants to disclose information (for example, information about adverse outcomes) to their GP : No

- Please enter contact details of GP. :

Consent

Consent

- Do your participants require support to give Consent : No

- How will Assent be obtained and by whom :

- Provide Further Information :

- Do you require Assent or Proxy Consent from participants e.g. because of their vulnerability : No

- Provide Further Information :

- Are you required to have Garda Clearance : No

- What is the time interval between giving information and securing Consent : Less Than 7 Days

- Provide Further Information : Participants will be given up to one calendar week (7 days) to consent.

- Describe how you will inform participants about the use of their Personal Data : This will be outlined in the Participant Information Leaflet (attached).

- Describe how participants can withdraw their Consent and/or their data : If participants wish to withdraw consent, they can contact Dr. Paul Leavy via email at leavypa@tcd.ie or by calling or texting a mobile phone number.

Funding

Funding

- Insert RPAMS number if applicable and available :

- Outline sources of funding, list names of all confirmed sources of funding or support (including in-kind benefit). For all, state if they are industry/commercial, state/public, philanthropic/charitable, other : Research funded by the Health Research Board SPHeRE 2018-1

- Please specify any funder specific requirements or obligations which should be brought to the attention of the ethics committee and or Trinity Innovation & Enterprise : N/A

- Will the results of the project be used or disclosed for commercial purposes : No

- Please clarify which party shall have the commercialisation and/or intellectual property rights : N/A

Conflict of Interest

- Are you aware of any possible Conflict of Interest arising from the funding or commercialisation of this project : : No

- Give details of the Conflict of Interest and what mitigation measures are in place :

- It there likely to be possible Conflict of Interest between the funders of the project and the aims and results of the project : No

- Give details of the Conflict of Interest and what mitigation measures are in place :

Sampling & Recruitment

Sampling and Recruitment

- Outline the sampling method : Purposive and snowballing sampling frames of general dental practitioners registered and practising in the Republic of Ireland, their professional representatives and health systems actors working in dental public health practice and academia, health policy, management and financing.

- Describe the time commitment of the participant : Anticipated interview duration approximately 60 to 75minutes. Additional time may be required for participants to be contacted and discuss or clarify points raised in interviews. Consent will be obtained from participants to do this.

- Will the research require/use a gatekeeper :No

- Outline the position/role of the gatekeeper within the organisation :

- Detail the role of the gatekeeper in the research :

- Is there a dependant relationship between the gatekeeper and the participants :

- Outline how this is going to be managed to mitigate against the dependencies :

- Please give a detailed step by step description of how participants will be recruited and append the recruitment material (Word limit: 100 words). : Approximately 15-20 key informant interviews will take place with clinical and non-clinical professionals with significant experience or knowledge/expertise in contracted primary oral healthcare in Ireland as well as relevant subject experts and academics. These will be identified by members of the research team which has broad networks in oral healthcare and policy in Ireland. Snowball sampling will also be used to identify further interviewees where appropriate.

Data Protection

Opening Questions

- Have all Trinity researchers (staff and students) in this project completed the College Data Protection GDPR training module? * :Yes

- Are all Trinity Staff and Trinity Students familiar with the Trinity College Personal Data Breach Procedural Guidelines? : Yes

---

Data Protection Assessement

- What is Trinity's role in the research? : Controller

- How many participants' Personal Data is being processed in this project? : <100

- List all types of Personal Data (including any special category or sensitive Personal Data) that you will process during the lifecycle of the project? : Name Contact telephone number Contact email address Postal address

- Does the research involve processing of special category data or data relating to criminal convictions and/or offences (sensitive personal data)? : No

- Is the Personal Data shared outside the research team with any other units within Trinity College? :No

- Name these units :

- Is this data shared with any third party outside of Trinity ? : No

- Provide names of these organisations and detail what Personal Data will be shared with them and why. :

- Describe what IT due diligence you have carried out on these organisations. : N/A

- Provide a general description of the security measures in place to keep Personal Data secure for each system, platform and application you will use for access, storage, and transfer, including but not limited to multi factor authentication, use of passwords, use of VPN, devise encryption, vendor ISO certification, anti-virus used, use of secure file transfers such as HEA net, and detail on how data is backed up etc. : Multifactor authentication (MFA) will be used for user access. Password protection measures are in place including updating passwords at regular intervals. IT software updates will also be acted upon as required. Data will be backed up securely to ensure access should a loss or system outage occur.

- Is the data transferred outside of the UK & EEA? If yes, you must contact the Data Protection Office : No

- Detail how long Personal Data will be retained in an identifiable or coded format. : All sensitive and identifiable information in research transcripts will be replaced at least 4 weeks after interviews. Any quotes used will remove any information that could directly or indirectly lead to the identification of participants. Following transcription, audio recordings will be deleted permanently. Each participant will be assigned an alpha-numeric code (e.g., 'GDP-FP-1'). A secure master file which will links participants' identities to alpha-numeric codes will be kept and accessible only by the PI. All data will be held securely on the PI's laptop, which is encrypted and password protected. Data will also be stored on the TCD M365 platform with restricted access via password. No data will be shared with any other unauthorised individual or third party. Transcripts will be retained for at least 10 years following this research's conclusion. This allows for potential verification of results, addressing any queries or challenges to the research findings and ensuring compliance with academic integrity.

Processing Risk

Type	Impact	Probabilty	Mitigation
DATA LOSS	High	Medium	REGULARLY BACK UP DATA TO SECURE AND OFFSITE LOCATIONS.
DATA BREACH	Medium	Low	ENCRYPT SENSITIVE DATA TO PROTECT FROM UNAUTHORISED ACCESS, CONDUCT REGULAR SECURITY CHECKS AND VULNERABILITY ASSESSMENTS.
UNAUTHORISED ACCESS: RISKS ASSOCIATED WITH INDIVIDUALS OR ENTITIES GAINING UNAUTHORISED ACCESS TO PERSONAL DATA	Medium	Low	STRONG ACCESS CONTROLS AND AUTHENTICATION MECHANISMS WILL BE IMPLEMENTED. FREQUENTLY REVIEWING AND UPDATING USER PERMISSIONS BASED ON ROLES AND RESPONSIBILITIES. USE OF MULTIFACTOR AUTHENTICATION (MFA) FOR INCREASED SECURITY.

Closing Section

- Include any additional information in respect of the research which may be relevant * :N/A

Appendix 12: Study 3: Realist Interview Study ethics approval email

30/10/2024

Title: How and why do health systems factors impact on private general dentists participation in state funded dental care in Ireland: a realist interview study

REAMs No: 1926

Dear Paul Leavy,

Your application has been reviewed by the relevant Research Ethics Committee (REC) and we are pleased to inform you that the above project has been approved.

Please note that any documents submitted for GDPR purposes in association with your ethics application are approved by the REC from an ethical perspective only (GDPR compliance is assumed, as per your uploaded letter of approval from the DPO).

It is the responsibility of the researcher/research team to ensure that, if applicable, all aspects of the study are executed in compliance with the General Data Protection Regulation (GDPR), the Health Research Regulations, Data Protection Act 2018, particularly regarding the storage and destruction of data arising from the research, and adhere to any relevant Health & Safety regulations.

Please note the reporting requirements outlined, in particular the need for:

- An immediate report of any serious or unexpected adverse event should be sent immediately to your REC via email. The Procedures for Reporting Adverse Events are outlined in the application. The Adverse Event form are available here.
- Any other unforeseen events should also be reported using this form and sent to your REC via email. The Adverse Event form are available here.
- An end of project report is due one year from the end of project date. The form is available here. This should be sent to your REC via email.
- If the data collection period is longer than 1 year, an annual report should be submitted. The form is available here. This should be sent to your REC via email.

You, and your research team (where applicable), are responsible for conducting the research strictly in the manner outlined in your application and supporting documentation, and in compliance with it. Proposed changes or amendments to the approved study must be submitted to the REC for approval in advance of any changes or amendments being implemented. In the event that the changes or amendments are significant, the REC may require a new submission. This ethical approval expires with the end dates of the project as stated in the application.

If you have any queries regarding this decision, please contact the Chair of your REC.

We wish you all the very best with your research project.

Kind Regards,

The REC

NB. If your study is to be conducted outside TCD, e.g. in a hospital site, please note that Trinity College REC approval does not of itself entitle you to conduct research in an external site. In this regard, the onus is upon you - the researcher, to ensure that all permissions have been obtained, and that any other requirements of the study site have been satisfied

NB. If your study involves a trial of medicinal products or medical devices, apps on humans you must provide a copy of your Clinical Trial Sponsorship from TCD - indicating that you have the appropriate trial insurance and sponsor oversight".

Appendix 13: Study 3: Realist Interview Study internal study protocol

PhD realist interview study (study 3): internal study protocol

Working title: "How and why do health systems factors impact on private general dentists' participation as contractors in state funded primary dental care in Ireland: a realist interview study"

PhD scholar:

Dr Paul Leavy, Centre for Health Policy and Management, Trinity College Dublin (TCD)

Supervisory team:

Professor Sara Burke, Centre for Health Policy and Management, TCD

Dr John Ford, Wolfson Institute of Population Health, Queen Mary University of London

Professor Blánaid Daly, School of Dental Science, TCD

September 2024

This research is funded by the Health Research Board SPHeRE 2018-1

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Background

'Smile agus Sláinte' - Ireland's National Oral Health Policy (NOHP) was published in 2019 and proposes reform of state-funded primary oral healthcare with care for all children (<16) and adult medical card holders being contracted to independent, private general dental practitioners (GDPs). At the current time only adult medical card holders receive state funded care delivered by GDPs on behalf of the Health Service Executive (HSE) – Ireland's publicly funded healthcare system under the Dental Treatment Services Scheme (DTSS). A separate cohort, adults who have paid sufficient social insurance contributions on their income, is eligible for an annual dental examination and cleaning under the Dental Treatment Benefit Scheme (DTBS) which is also delivered by GDP contractors but is not part of the HSE. Currently, children under 16 are eligible for urgent care and two episodes of targeted comprehensive care only (at ages ~7/8 and ~12) delivered by the HSE salaried Public Dental Service (PDS). Access to care is resource dependent throughout the state and in many instances is limited.

Recent years have seen the number of GDP-contractors participating in the DTSS decline from 1800 in 2016 to just under 800 in 2023. This has resulted in restricted access to care and widening oral health inequities. Concurrently, the Irish government is in the process of implementing the NOHP which is reliant upon GDPs voluntarily opting into or remaining in the state system. This current workforce crisis isn't unique to Ireland or oral healthcare. It is symptomatic of wider health system problems. In this context, understanding system drivers and how they influence the system to deliver services can help bridge a policy implementation gap.

A recently completed realist review of the international literature identified a myriad of health systems contexts and hidden mechanisms influencing GDPs participation in state funded care. These include system emphasis on treatment and dentist led care, low priority for oral healthcare, funding constraints, and change implementation with minimal clinician consensus. At operational level, contracts can restrict GDP decision-making and ability to deliver high quality, holistic patient care. Key underlying mechanisms identified were feelings of ceded clinical and entrepreneurial control, stress and demoralisation, mistrust of the system and feeling undervalued. Notably, the realist review did not identify qualitative, mechanistic-rich studies examining this topic from the Irish perspective. Most studies were from the UK and focussed on National Health Service (NHS) general dental services which differ from state schemes in Ireland.

Study aim

This study seeks to understand what health system factors have influenced private GDPs decisions to participate in state funded, contracted primary oral healthcare services in Ireland to date, and

what factors might influence their participation in reformed services as proposed in the National Oral Health Policy.

Study design

Realist interview study.

Rationale

The study will build on a subset of findings from the recently completed realist review (submitted for peer review 29/09/24) and quantitative data from a health systems analysis of general dentist workforce indicators in Ireland (completed in December 2023). In contrast to the realist review, which looks at health system factors and the private GDP workforce from an international and wide health systems perspective, this study will focus on Ireland and utilise primary data captured via interviews. A realist interview study was chosen to gain a deeper understanding of this complex topic by expanding our understanding of results that emerged from the realist review but with a focus on Ireland where there has been a marked reduction in GDP participation in the DTSS. Furthermore, this area of investigation has been chosen because it is currently under-researched in the Irish context and, in anticipation of NOHP's implementation, the findings will add to the pool of evidence that healthcare policy makers, workforce planners and health service managers can draw upon to inform their respective workstreams and policy implementation strategies.

Methods

Using theories from a recently completed realist review as a starting point, interviews with frontline GDPs, policymakers, health service managers and subject expert academics will be utilised to generate updated theories relevant to the Irish system. Interviews in this study will be conducted by the PhD scholar (PL) using a realist technique known as the 'teacher-learner' cycle.[1] In interviews, participants will be asked a combination of open-ended questions (to enlighten possible new CMOCs) and be presented with theories (or vignettes) based on some of the CMOCs and final programme theory from the earlier realist review. They will be asked to reflect on whether CMOCs/theories fit with their own perceptions and experiences in the Irish setting (and in what ways) and to modify or refine these them accordingly. The 'teacher-learner' cycle entails the researcher first teaching the interviewee about their theories, with the interviewee then teaching the researcher about their perceptions and experiences. This process helps the researcher to explore how different mechanisms and contexts may result in both intended and unintended outcomes and refine theories. This approach differs to standard qualitative interviews where the interviewer ordinarily puts aside their own preconceptions or assumptions. By their very logic, in realist interviews the interviewer brings their own theories, which has an influence on the types of

questions and how they are asked. Similarly, the interviewee will have their own ideas about what the interviewer is interested in, which influences the answers they provide. In realist, theory-driven research, the interview is used as a means for empowering participants to revise and expand putative theories.

Participant sampling and recruitment

Primary data collection will take place through semi-structured, qualitative realist interviews with key stakeholders practicing in, planning, and managing contracted oral healthcare services in Ireland as well as academic subject experts with extensive oral healthcare systems knowledge and insight from both Ireland and overseas. Inclusion and exclusion criteria for participant recruitment is as follows:

Inclusion	Exclusion
Participants working or having experience or extensive knowledge of state funded, contracted primary oral healthcare services in the Republic of Ireland. These include: • frontline GDPs (Dental Council registered, in practice) • GDP with union experience (Dental Council registered, in practice) • Oral healthcare policymakers and those involved in policy implementation • Oral health service contract/scheme managers or administrators • Oral healthcare system academic subject experts (Ireland) • International academic subject experts in oral healthcare systems (with insight into Irish system)	Excluded populations will include those who: • do not work in the oral healthcare system in Ireland (at frontline clinician or health systems level) • are not part of the wider professional, academic or political ecosystem as outlined in inclusion criteria • those without requisite oral health systems academic subject knowledge or expertise at Irish or international level (as outlined in inclusion criteria)

Participants will be identified by research team members who have extensive oral healthcare networks in Ireland and internationally. Recruitment will primarily be via purposive and theoretical sampling with additional participants being identified through snowball sampling. Participants will be selected based on their ability to contribute to, refine or consolidate programme theory. Subject diversity will also be a key component to help develop rounded programme theory. The target/anticipated number of participants for this study is 10-15.

The following maximum variation sampling framework will be used to inform participant recruitment:

Participant (inclusion criteria)	Target number (N)
Practising GDP – established (5+ years) • with union experience x 1 (e.g., committee) • Within DTSS • Previously within DTSS • Never in DTSS	2-3
Practising GDP – newly qualified or 'early career' (<5 years) • Within DTSS • Previously or never in DTSS	2
With oral health policy national experience – development and implementation (Ireland)	2-4
With health service/HSE DTSS scheme management, administration experience	1-2
Oral health system (Ireland) academic subject expert	1
International academic expert in oral health systems (with Irish system experience/insight)	2

Interview schedule

An interview schedule will be developed using realist interview language and will follow the RAMESES II Project guidance on realist interviews.[2] CMOCs and the final programme theory from the realist review will be utilised as the starting point for developing refined or new CMOCs most relevant to the Irish context and setting. These will be explored, refined, and utilised as the basis for the initial programme theory and investigation in this study. As this study builds up findings of a realist review, the focus of interviews will primarily be on testing or refining programme theory.

Before its use, the draft interview schedule will be piloted among a small convenience sample of non-dentists (1 or 2) currently undertaking a PhD and known to the PI. These will be informal, and data captured will not be utilised in the analysis. The purpose of piloting will be to assess its face validity and gauge the interviewees understanding and comprehension of questions.

Data collection

Interviews will be conducted via online videoconferencing using a TCD account (e.g., Microsoft teams) or in person (at a venue convenient for interviewee/interviewer) or via telephone, whichever is most appropriate/practical for the interviewer/interviewee. Interviews will be recorded using a TCD approved laptop and transcribed verbatim.

There is no suggested minimum number of realist interviews required for realist interview studies. The required number of interviews is determined by the relevance and rigour of interview data, i.e., for gathering, refining and/or consolidating theory.

Data analysis

Transcribed interview data will be uploaded and analysed using NVivo 12 Pro software. A series of initial codes will be developed inductively using data from interviews analysed first. These will subsequently be utilised and expanded on throughout the remainder of the data analysis for the interviews. Where applicable and practical, thematic sampling will be adopted whereby data emerging from earlier interviews will be coded, provisionally analysed, and incorporated into new/revised interview schedules. This approach will allow for the exploration of new topics/themes emerging from interviews in real time.

Data from interviews will be analysed separately before being triangulated and systematically explored for agreement and disagreement between sources. It is probable that the perspectives of dentists may not align with health policy makers, planners, or managers/administrators therefore investigation of any disagreements between sources will form a key component of the interpretation phase and will add to the analysis and understanding of factors that have contributed to the reduction in GDP participation in the DTSS. Triangulated data from all sources will be utilised to create CMOCs iteratively. CMOCs will inform the development of a refined final programme theory.

Project Advisory Group (PAG)

In line with the realist review, a project advisory group of stakeholders external to the study participants will be convened. The purpose of this groups will be to appraise, confirm, refine and or refute emerging findings from the study. PAG meetings will be held online with stakeholders including frontline clinicians, service managers and patient and public contributors.

Research ethics

Ethical approval will be sought from the TCD Centre for Health Policy and Management and Centre for Global Health Research Ethics Committee via the TCD Research Ethics Application Management System (REAMS). An application was submitted for approval on 12/09/2024 and is currently under review.

Dissemination of results

This research will be disseminated in the form of a publication in a peer-reviewed scientific journal and presented at national and international conferences or symposia where appropriate. Results will also be shared via online social media channels and through the TCD Centre for Health Policy and Management website.

Challenges and contingencies

Identification and recruitment of participants

Identification and recruitment of a suitable cohort of participants for the realist interviews may be a challenge, especially system 'elite' actors working in policy development or implementation or contract management. As outlined already, the researcher intends to recruit key actors delivering, managing, and planning oral healthcare services in Ireland through the research team's professional networks. The oral healthcare community in Ireland is small and this approach has worked favourably thus far in recruiting stakeholders to the realist review project advisory group (PAG), including representation from the Department of Health and Irish Dental Association (IDA). The option to hold interviews online or over the phone at a time that suits participants, for example in the evenings and after clinics, could also be explored and adopted to boost recruitment.

References

1. Pawson, R. Theorizing the Interview. Br. J. Sociol. 1996, 47, 295, https://doi.org/10.2307/591728.
2. RAMESES II Project. The Realist Interview. https://www.ramesesproject.org/media/RAMESES_II_Realist_interviewing.pdf

Draft interview guide

Study title: How and why do health system factors impact on private general dentists participation in state funded dental care in Ireland: a realist interview study.

Introduction: Explain the study and goal: understanding health system factors that influence private GDP participation in state funded primary care as contractors.

Questions:

1. **Contextualising the role of the interviewee: ask the interviewee about their involvement in / experience or knowledge of and views about state funded contracted primary oral healthcare in Ireland.**

a. Please describe your current role(s) in primary oral healthcare and what it involves.

or

Can you tell me what your involvement in / experience of contracted state funded dental care in Ireland has been?

b. What are your thoughts/views about state funded dental schemes in Ireland at the present time?

2. **Theory testing and refinement: CMOC 1: Quality care and job satisfaction**

a. *Some of the research that I have read says that tight/limited state funding often mean restrictions are built into public contracts (to contain costs).*

- *What is your experience of this?*
- *Could you tell me more about that?*
- *Give me an example of where you experienced this or know of this?*

b. *I have also read that systems or contracts tend to focus on treatment - 'drilling and filling' rather than prevention and focus on care delivery by dentists (rather than wider team members)*

- *Is that your experience?*
- *What do you think is the effect of this on how schemes are designed and funded?*

c. *I've read that funding constraints and subsequent contract restrictions can impact on GDP job satisfaction and morale because they feel they can't deliver high quality, comprehensive care to patients.*

- *What is your experience of that?*
- *Why do you think this happens?*
- *What do you think is a consequence of this among GDPs- can you give an example?*
- *Do you think this/these outcome(s) is/are the same for all GDPs- associates, principals, urban GDPs, rural GDPs, young GDPs, more established GDPs?*

d. *In what other ways do funding arrangements and contract restrictions affect GDPs' satisfaction/ ability to practice/offer care to their patients?*

e. *Perhaps show CMOC 1 (see Appendix below) to demonstrate how I have synthesised my findings from other research.*

- *Does this look right based on your experience?*
- *Is there anything missing?*
- *What are examples where this doesn't happen this way?*
- *Does this happen for all GDPs, or does it only happen sometimes/among some GDPs but not others? Why do you think this is?*

3. **Theory testing and refinement: CMOC 3: Clinical autonomy and control**

a. *Additionally, I have read that for contracts/schemes to be delivered within tight budgets and be standardised, there may be a high degree of health systems oversight or management where GDP local decision making is restricted (for example…).*

- *Is that your experience?*
- *How does this oversight/management affect GDPs?*
- *How do restrictions on clinical decision-making affect GDPs?*
- *What does this lead to? Why do you think this is?*

b. *I've read that contract restrictions can lead to GDPs feeling like they've lost clinical control/autonomy or decision-making ability.*

- *What is your experience of that?*
- *Why do you think this happens?*
- *What does this lead to? Why do you think this is?*

c. *Perhaps show CMOC 3 (see Appendix below) to demonstrate how I have synthesised my findings from other research.*

- *Does this look right based on your experience?*
- *Is there anything missing?*
- *What are examples where this doesn't happen this way?*
- *Does this happen for all GDPs, or does it only happen sometimes/among some GDPs but not others? Why do you think this is?*

4. **Theory testing and refinement: CMOC 4: Business control, consensus, and trust**

a. *I have also read and been told by others that when changes to contracts (or how they are administered) are made with minimal communication or consensus, this can result in professional opposition, especially when viewed as unfavourable. For example, if fees are reduced or items of service are cut, or prior approval isn't granted/payments aren't made.*

- *What is your experience of this?*
- *How does this affect GDPs?*
- *Do you think this changes the way GDPs think or feel about state schemes in any way or those planning or managing these schemes?*

- *Can you provide some examples of this? Is this something you have experience of?*
- *What is it about the way [state schemes] or [named state scheme] is/are/was/were changed/administered that made/makes some GDPs feel or think this way?*

b. Perhaps show CMOC 4 (see Appendix below) if helpful.

- *Does this look right based on your experience?*
- *What is missing?*
- *What are examples where this doesn't happen among some GDPs vs others?*
- *Does this happen for all GDPs, or does it only happen sometimes/among some GDPs but not others? Why do you think this is?*

5. Theory testing and refinement: CMOC 6: Value of state funded dental care

a. Finally, Im interested in the concept of GDPs feeling undervalued in state schemes. I've read that a multitude of factors can make GDPs feel undervalued including low political priority for dentistry, low regard for these schemes (among society and the profession) and a perception that patients don't appreciate the high costs of delivering care, for example if patients do not attend their appointments.

- *Is that your experience?*
- *How does this affect GDPs?*
- *What does this lead to? Why do you think this is?*

b. Ive also read that strong demand in purely private dentistry including cosmetics and facial aesthetics can lead some GDPs to feel more valued while providing care in such markets.

- *Is that your experience?*
- *How does this affect GDPs?*
- *What does this lead to? Why do you think this is?*

c. Perhaps show CMOC 6 (see Appendix below) to demonstrate how I have synthesised my findings from other research.

- *Does this look right based on your experience?*
- *Is there anything missing?*
- *What are examples where this doesn't happen this way?*
- *Does this happen for all GDPs, or does it only happen sometimes/among some GDPs but not others? Why do you think this is?*

6. Wrap up and assistance with further study

a. If you could change something about state dental schemes in Ireland to make them work better, what would you change and why?

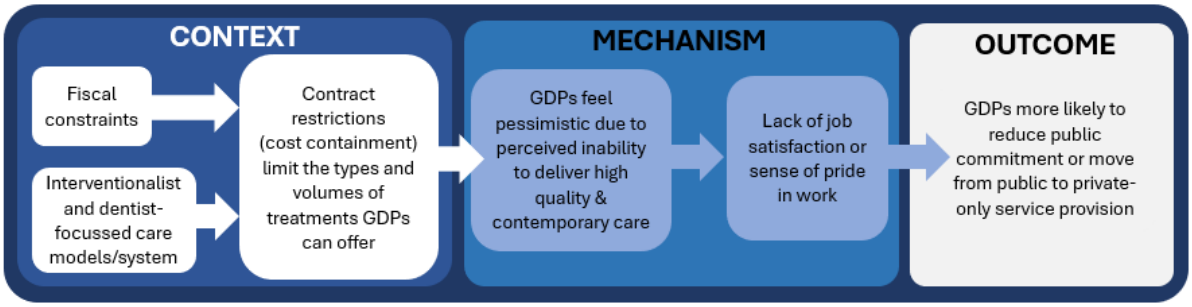
b. *What else do you think I need to know, to really understand why dentists are leaving / reluctant to join/remain in [some] state schemes / the DTSS here in Ireland?*

Interviewees will be asked for help in identifying sources of information such as grey literature and organisational policy and operations documents, as well as identifying other potential interviewees who may have something to add to the study.

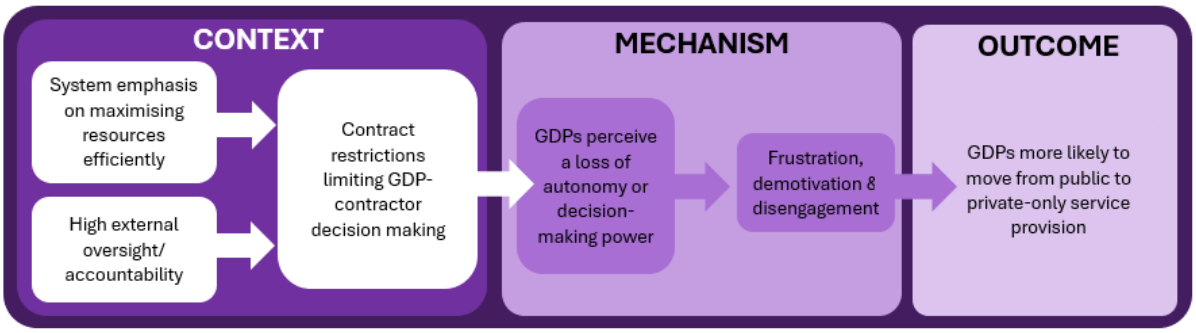
END

Context-Mechanism-Outcome Configuration (CMOCs) from realist review of literature (completed August 2024):

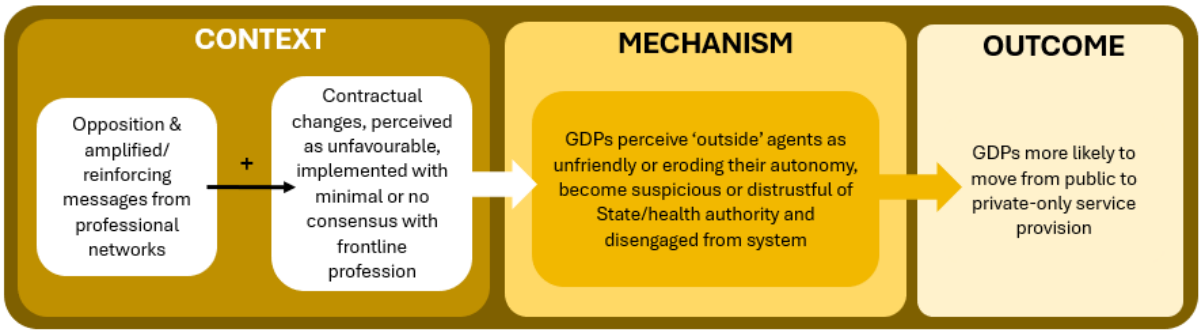
CMOC 1: Quality care and job satisfaction



CMOC 3: Clinical autonomy and control



CMOC 4: Business control, consensus, and trust



Appendix 14: Study 3: Realist Interview Study interview schedule

V1 (November 2024)

So [NAME], once again, thank you very much for agreeing to take part in this interview.

Before we begin, can I just confirm that you have read and understood the PIL, signed the consent form and you agree to take part as per the consent form?

Can I also confirm that you are happy for me to record and transcribe this interview?

Great, so just to clarify, the aim of this study is to understand what are the health system factors that have influenced private GDPs decisions to participate in state-funded, primary oral healthcare schemes in Ireland as contractors to date (or not).

So the way the interview will work is, we'll begin with some general questions about the oral healthcare system here in Ireland and then we'll turn to my findings from the international literature review- which I will talk you through as different theories and you will then have the opportunity to comment on, to build upon, refine or refute these, based on your own experience and thinking about the Irish context.

I'm not sure if you've had an opportunity to look through the reading material in advance?

If you have any questions, I am happy to answer these now.

Questions:

1. Contextualising the role of the interviewee: ask the interviewee about their involvement in / experience or knowledge of and views about state funded contracted primary oral healthcare in Ireland.

a. Please describe your current role(s) in primary oral healthcare and what it involves.

or

Can you tell me what your involvement in / experience of contracted state funded dental care in Ireland has been?

b. What are your thoughts/views about state funded dental schemes in Ireland at the present time?

c. From your experience, why do you think there has been a reduction in the number of dentists holding DTSS contracts or submitting claims on the DTSS over the past 10 years?

d. Conversely, from your experience, why you think the number of GDPs holding PRSI contracts has increased?

2. Theory testing and refinement:

CMOC 1: Quality care and job satisfaction

a) Based on your experience and thinking about the Irish system, does this look accurate?
b) Is there any aspect of this that you think isn't accurate?
c) Is there anything missing?
d) Why do you think this happens?
e) Do you think this is accurate for all GDPs, or does it only happen sometimes or among some GDPs but not others? Why do you think this is?

Additional prompts:

Can you give an example from your own experience?

Some of the research that I have read says that tight/limited state funding often mean restrictions are built into public contracts (to contain costs).

- *What is your experience of this?*
- *Could you tell me more about that?*
- *Give me an example of where you experienced this or know of this?*

I have also read that systems or contracts tend to focus on treatment - 'drilling and filling' rather than prevention and focus on care delivery by dentists (rather than wider team members)

- *Is that your experience?*
- *What do you think is the effect of this on how schemes are designed and funded?*

I've read that funding constraints and subsequent contract restrictions can impact on GDP job satisfaction and morale because they feel they can't deliver high quality, comprehensive care to patients.

- *What is your experience of that?*
- *Why do you think this happens?*
- *What do you think is a consequence of this among GDPs- can you give an example?*
- *Do you think this/these outcome(s) is/are the same for all GDPs- associates, principals, urban GDPs, rural GDPs, young GDPs, more established GDPs?*

In what other ways do funding arrangements and contract restrictions affect GDPs' satisfaction/ ability to practice/offer care to their patients?

3. Theory testing and refinement:

CMOC 3: Clinical autonomy and control

a) Based on your experience and thinking about the Irish system, does this look accurate?
b) Is there any aspect of this that you think isn't accurate?
c) Is there anything missing?
d) Why do you think this happens?
e) Do you think this is accurate for all GDPs, or does it only happen sometimes or among some GDPs but not others? Why do you think this is?

Additional prompts:

Can you give an example from your own experience?

Additionally, I have read that for contracts/schemes to be delivered within tight budgets and be standardised, there may be a high degree of health systems oversight or management where GDP local decision making is restricted (for example…).

- *Is that your experience?*
- *How does this oversight/management affect GDPs?*
- *How do restrictions on clinical decision-making affect GDPs?*
- *What does this lead to? Why do you think this is?*

I've read that contract restrictions can lead to GDPs feeling like they've lost clinical control/autonomy or decision-making ability.

- *What is your experience of that?*
- *Why do you think this happens?*
- *What does this lead to? Why do you think this is?*

4. Theory testing and refinement:

CMOC 4: Business control, consensus, and trust

a) Based on your experience and thinking about the Irish system, does this look accurate?
b) Is there any aspect of this that you think isn't accurate?
c) Is there anything missing?
d) Why do you think this happens?
e) Do you think this is accurate for all GDPs, or does it only happen sometimes or among some GDPs but not others? Why do you think this is?

Additional prompts:

Can you give an example from your own experience?

What is it about the way [state schemes] or [named state scheme] is/are/was/were changed/administered that made/makes some GDPs feel or think this way?

I have also read and been told by others that when changes to contracts (or how they are administered) are made with minimal communication or consensus, this can result in professional opposition, especially when viewed as unfavourable. For example, if fees are reduced or items of service are cut, or prior approval isn't granted/payments aren't made.

- *What is your experience of this?*
- *How does this affect GDPs?*
- *Do you think this changes the way GDPs think or feel about state schemes in any way or those planning or managing these schemes?*
- *Can you provide some examples of this? Is this something you have experience of?*
- *What is it about the way [state schemes] or [named state scheme] is/are/was/were changed/administered that made/makes some GDPs feel or think this way?*

5. Theory testing and refinement:

CMOC 6: The value of State-funded primary dental care

a) Based on your experience and thinking about the Irish system, does this look accurate?
b) Is there any aspect of this that you think isn't accurate?
c) Is there anything missing?
d) Why do you think this happens?
e) Do you think this is accurate for all GDPs, or does it only happen sometimes or among some GDPs but not others? Why do you think this is?

Additional prompts:

Can you give an example from your own experience?

6. Wrap up and assistance with further study

a) If you could change something about state dental schemes in Ireland to make them work better, what would you change and why?
b) What else do you think I need to know, to really understand why dentists are leaving / reluctant to join/remain in [some] state schemes / the DTSS here in Ireland?

Interviewees will be asked for help in identifying sources of information such as grey literature and organisational policy and operations documents, as well as identifying other potential interviewees who may have something to add to the study.

END

Appendix 15: Study 3: Realist Interview Study participant invite letter/email (GDPs)

Trinity College Dublin
Coláiste na Tríonóide, Baile Átha Cliath
The University of Dublin

CENTRE FOR HEALTH POLICY AND MANAGEMENT
3-4 Foster Place | Dublin 2 | Ireland

September 2024

Invitation to participate in a Realist Evaluation Study on health system factors and their influence on private general dental practitioners' participation in contracted dental care in Ireland

Dear Colleague,

As part of a PhD which I am completing at Trinity College Dublin (TCD) Centre for Health Policy and Management researching general dental practitioners (GDPs) engagement and participation in state-funded, contracted primary dental care services, I wish to interview GDPs with current or previous experience in the medical card (DTSS) and/or PRSI (DTBS) schemes. The purpose of these interviews is to investigate how, why, for whom and to what extent health system factors influence GDPs decisions to provide state funded care as contractors (or not) here in Ireland.

My research supervisors are Professors Sara Burke (TCD), Blánaid Daly (TCD) and Dr John Ford (Queen Mary University of London, UK).

Interviews will take place online using videoconferencing, via telephone or in person, whichever is most convenient. These will be one-to-one and will be completely confidential.

If you think you would like to participate in this important study, please contact me at leavypa@tcd.ie and I will provide further details.

Yours sincerely,

Dr Paul Leavy

SPHeRE Programme PhD Scholar, TCD

Research funded by the Health Research Board SPHeRE 2018-1

SPHeRE Structured Population Health, Policy and Health-services Research Education

HRB Health Research Board

https://www.sphereprogramme.ie/

DRAFT

Appendix 16: Study 3: Realist Interview Study participant invite letter/email (non-GDPs)

Trinity College Dublin
Coláiste na Tríonóide, Baile Átha Cliath
The University of Dublin

CENTRE FOR HEALTH POLICY AND MANAGEMENT
3-4 Foster Place | Dublin 2 | Ireland

September 2024

Invitation to participate in a Realist Evaluation Study on health system factors and their influence on private general dental practitioners' participation in contracted dental care in Ireland

Dear Colleague,

As part of a PhD which I am completing at Trinity College Dublin (TCD) Centre for Health Policy and Management) researching general dental practitioners (GDPs) engagement and participation in state-funded, contracted primary dental care, I wish to interview individuals with current or previous health policy, planning, management experience or academic expertise in these services in Ireland. The purpose of these interviews is to investigate how, why, for whom and to what extent health system factors influence GDPs decisions to provide state funded care as contractors (or not) here in Ireland.

My research supervisors are Professors Sara Burke (TCD), Blánaid Daly (TCD) and Dr John Ford (Queen Mary University of London, UK).

Interviews will take place online using videoconferencing, via telephone or in person, whichever is most convenient. These will be one-to-one and will be completely confidential.

If you think you would like to participate in this important study, please contact me at leavypa@tcd.ie and I will provide further details.

Yours sincerely,

Dr Paul Leavy

SPHeRE Programme PhD Scholar, TCD

Research funded by the Health Research Board SPHeRE 2018-1

SPHeRE Structured Population health, Policy and Health services Research Education

HRB Health Research Board

https://www.sphereprogramme.ie/

DRAFT

Appendix 17: Study 3: Realist Interview Study call for GDP participants (social media campaign)

Appendix 18: Study 3: Realist Interview Study guidance for participants

Study Guidance:

How and why do health system factors impact on private general dentists' participation in State-funded dental care in Ireland: a realist interview study

Version 1 (November 2024)

Dear [NAME],

Many thanks once again for agreeing to take part in this study.

Realist interview studies seek to build theory and are explanatory in nature. They seek to understand how, why, for whom, to what extent, and in what circumstances certain outcomes occur.

The purpose of this study is to understand the health system factors that influence private general dental practitioners' (GDPs) participation as contractors in State-funded primary dental care schemes in Ireland, for example the Dental Treatment Services Scheme (DTSS).

Outlined below are four theory statements which have been created following a review of the international literature. These will be used as the basis of discussion to address the research question in this study.

You are invited to read these in advance please. No other preparation is required.

Many thanks,

Paul Leavy
PhD Scholar – SPHeRE Programme

Theory 1: Quality care and job satisfaction

Statement: When health systems use care models which are predominantly treatment-focussed, and centred on delivery by dentists, and where State (government) funding is limited, this often means restrictions are built into State dental contracts to contain exchequer costs (for example, on the number of procedures permissible in a given period).

For some GDPs, operating within these contracts can trigger feelings of pessimism, because they perceive an inability to offer their patients care that they consider to be high quality, contemporary or comprehensive. GDPs may be less likely to feel a sense of satisfaction (reward) or pride in their work.

This can prompt some GDPs to reduce their commitment on public schemes or seek employment elsewhere, for example, fully private practice where fewer restrictions may exist.

Theory 2: Clinical autonomy and control

Statement: For State dental contracts (schemes) to be delivered within tight budgets, and be standardised, there may be a high degree of health systems' oversight or management where GDPs' local decision making is restricted (for example, through the use of provisos, or prior approval mechanisms).

These restrictions can lead some GDPs to feel like they've lost or lack clinical autonomy or decision-making power, which can lead to frustration, demotivation and disengagement with the State system.

Over time, this can have the effect of pushing some private GDPs away from providing care on the State system, towards private only care where fewer restrictions may exist, or where there may be less external oversight or accountability.

Theory 3: Business control, consensus, and trust

Statement: When State dental contracts are changed (or administered / operated) with minimal communication or consensus with frontline GDPs, this can result in professional opposition, especially when terms and conditions are viewed as unfavourable.

This opposition may be amplified or reinforced by messages from GDPs' wider professional networks.

This can trigger or reinforce feelings of eroded entrepreneurial or business control among some GDPs, and lead to disappointment and suspicion or mistrust of the health system, leading to demotivation and disengagement with the system.

Over time, this can have the effect of pushing some GDPs away from the public system towards private only care where fewer contract restrictions exist or there may be less external influence.

Theory 4: The value of State-funded primary dental care

Statement: There is an absence of political priority for primary care dentistry (compared to other health or oral health services) and limited societal importance placed on routine oral healthcare, but there may be a strong market demand for non-routine, 'cosmetic' care. Furthermore, there may be stigma or denigration of State-funded dental care among the profession and some within wider society, where it may be perceived as 'second rate'.

In this context, and where State schemes feature patient co-payments (as a means of controlling demand and containing costs), but where these are low compared to private fees (or patients are exempt from payment), some GDPs may feel undervalued as professionals, because they perceive that the State or patients do not value them or appreciate the high costs of delivering care, for example if they do not attend their appointments.

This can cause GDPs to move away from public care provision towards private-only care or 'non-routine' care (e.g., facial aesthetics) where they anticipate there may be greater appreciation for services provided**.**

END

Appendix 19: Study 3: Realist Interview Study participant information leaflet

Trinity College Dublin
Coláiste na Tríonóide, Baile Átha Cliath
The University of Dublin

Participant Information Leaflet

Study Title	How and why do health system factors impact on private general dentists' participation in State-funded dental care in Ireland: a realist interview study
Principal Investigator (PI)	Paul Leavy, PhD Scholar, Centre for Health Policy and Management, Trinity College Dublin, Ireland
Primary Supervisor	Associate Professor Sara Burke, Centre for Health Policy and Management, Trinity College Dublin, Ireland
Co- Supervisors	Professor Blánaid Daly, School of Dentistry, Trinity College Dublin, Ireland Dr John Ford, Queen Mary University of London, UK
Data Controller	Trinity College Dublin (for research data)
Data Protection Officer (Research Data)	Data Protection Officer Secretary's Office Trinity College Dublin Dublin 2

Introductory Statement

You have been invited to participate in a research study by Paul Leavy (Principal Investigator) as part of his PhD research to obtain a PhD from Trinity College Dublin.

Before you decide whether you wish to take part, please take time to read this information leaflet carefully and discuss it with others if you wish.

If there is anything which is not clear, or if you would like more information, please ask the principal investigator. You should understand the benefits and risks of taking part in this study so that you can make a decision that is right for you.

Do I have to take part?

No, you don't have to take part in this study. It is entirely voluntary and up to you. If you decide not to take part, it won't affect you in any way. Don't feel rushed or under pressure to take part or to make a quick decision. You can change your mind and opt-out at any time, even if the study has started.

This leaflet has six parts:

Part 1 - The Study

Part 2 - Data Protection

Part 3 - Approval, Organising and Funding

Part 4 - Future Research

Part 5 - Further Information

Part 6 – Next steps

Part 1 - The Study

Why have I been invited to take part?

You have been asked to take part because of your relevant experience, knowledge and/or expertise in State funded, contracted primary oral healthcare services in Ireland.

Why is this study being done?

The aim of this study is to examine how, why, for whom and to what extent health system factors have influenced private general dental practitioners' (GDPs) participation in state funded primary dental care services in Ireland as contractors, and what factors may influence their participation in future, reformed services as proposed in Smile agus Sláinte – Ireland's National Oral Health Policy (2019).

What does taking part involve?

After you have been sent an email with a participation letter, participation information leaflet, and consent form, you will be given at least seven days to decide whether you would like to partake in the research. If you express an interest, you will be asked by the Principal Investigator (PI) Dr Paul Leavy to sign and return a consent form. You should also keep a copy for your records. All consent forms will be saved on the PI's drive on an encrypted computer locked by a passcode. Once the PI has received your signed consent form, the PI will contact you to schedule a one-on-one interview through videoconference (e.g., Microsoft Teams) or by telephone or in person at a time and location that best suits you. Once a time, location, and date are agreed upon, the PI will send you a diary invite to your email address. The diary invite will include videoconference details to log in at the scheduled date and time or a cover note outlining the location of the meeting. The interview will be approximately 45-75 minutes long and, with your permission, will be recorded and transcribed. A series of statements regarding State-funded, contracted oral healthcare services in Ireland will be presented to you and you will be asked a series of questions regarding these, for example, your experiences or opinions. You will not be asked any questions which are personal or sensitive. If any aspects raised during the interview require clarification or elaboration, you may be contacted again by the PI for further information. The transcriptions will be stored on the PI's drive on an encrypted TCD laptop computer locked by a passcode. If you wish to obtain a copy of your transcription, you can request this in writing to the PI through leavypa@tcd.ie

What are the possible benefits of taking part?

Taking part in this study will not directly benefit you. However, the research will feed into Dr Paul Leavy's PhD which is funded by the Government of Ireland through the Heath Research Board (HRB) as part of the SPHeRE programme (https://www.sphereprogramme.ie). SPHeRE has a strong emphasis on research with policy and system impacts and the purpose of this PhD is to specifically inform oral health policy implementation and oral health workforce planning in Ireland, with respect to contracted care. Your coded/encoded data and information may help us better understand the health systems factors and how they impact the GDP-contractor workforce in the context of broader policy implementation. By participating, you are helping to advance health policy, service design and workforce planning for future generations.

Are there any possible disadvantages or risks from taking part?

Your absolute anonymity and confidentiality are guaranteed, and the PI will take great care to ensure the confidentiality of all data. Due to the process put in place to protect your data, the risk of a breach of confidentiality to participants is considered very low. You will be allocated an anonymised identifier, and your name will not appear in any outputs related to the findings. There are no anticipated negative consequences for you in participating in this research.

What will happen to the results of the study?

The study results will be published in the form of a PhD dissertation, and a soft (electronic) copy will be made available to all participants if requested.

The dissertation results may be published in academic journals or presented at conferences where parts of interviews may be quoted.

At no point will any information that reveals your identity be disclosed.

A copy of your interview transcript will be shared with you.

Part 2 - Data Protection

What information about me (personal data) will be used for this study

The PI will use the contact details you have provided to arrange an interview with you. The audio recording of your interview and the final transcript will also be collected. Please note that none of your personal data will be reported in the published study and will always be kept strictly confidential. Extracts from the interview may be used as quotations; however, any information that might disclose your identity will not be included.

Who will access my personal data?

The PI will replace your name with a code on all research data databases and keep the master file, which links your identity to the interview transcript. Only the PI will have access to this file. The research supervisors listed above may also require access to your interview transcription to ensure academic rigour; however, only the PI can link the research data back to you.

How is the information kept confidential and secure?

Your privacy is important. The PI will take many steps to protect your confidentiality. To ensure this, your name will be replaced with a code on all your research data. Only the PI and if necessary, the supervisor can link the research data back to you.

All research data is held securely on the PI's laptop, which is encrypted and secured with a password. This will also be backed up on the TCD Microsoft Office 365 cloud platform with restricted access via password. The research supervisors who are listed above may also require access to the research data (interview transcript) to ensure academic rigour; however, only the PI can link the research data back to you. Interviews may be conducted using a Trinity College Dublin (TCD) videoconference account or take place via telephone or in person. Your interview will be transcribed, anonymised, and uploaded into NVivo, a data analysis software tool provided by TCD, for analysis.

No information will be distributed to any other unauthorised individual or third party.

A professional code of ethics governs the PI and co-supervisors to maintain your confidentiality.

A data protection impact assessment was conducted, and the risk identified was low.

Confidentiality may be breached in circumstances in which the research team strongly believes, or evidence exists that there is a serious risk of harm or danger to you or another individual. Disclosure may also be required in a professional code, legal process, or Garda

investigation. In such instances, information may be disclosed to significant others or appropriate third parties without permission from you being sought. Where possible, a full explanation will be given to you regarding the necessary procedures and the intended actions that may need to be taken.

How long will my personal data be needed?

The audio recording of the interview will be retained until it has been transcribed and the content verified, after which it will be securely deleted.

This project has been funded entirely by the Health Research Board (HRB). As per the HRB's policy, pseudonymised research data used in any publications must be made available to other researchers at the time of publication. The policy also requires that the data be kept for at least 10 years. After that, if applicable, the link between you and your personal data—which is, at all times, strictly accessible only to the PI—will be securely deleted.

What is the lawful (legal) basis to use my personal data?

By law,[1] we can use your personal information for scientific research[2] (in the public interest[3]). This research is being carried out to identify factors influencing GDPs participation in state funded dental schemes in Ireland and ensure an appropriate provision of GDPs in the public healthcare system. This research comes an important time, given the forthcoming implementation of the National Oral Health Policy, and it is therefore in the public interest to do this work. We will also ask for your explicit consent to use your data as a requirement of the Irish Health Research Regulations.

What are my rights under Data Protection law?

You are entitled to:

- object to our use of your personal data or any further use.
- request access to your personal data and receive a copy of it.
- request inaccurate personal data be corrected or deleted.
- request the restriction of our use of your personal data.
- request deletion of your personal data.

By law, you can exercise the above rights regarding your personal data unless the request would make it impossible or very difficult to conduct the research. For example, if the study is about to be published, we may not be able to delete data as it would impact the results.

You can exercise these rights by contacting the PI, *Paul Leavy, leavypa@tcd.ie* or the Trinity College Data Protection Officer, Secretary's Office, Trinity College Dublin, Dublin 2, Ireland. Email: *dataprotection@tcd.ie*. Website: *www.dataprotection.ie.*

[1] The European General Data Protection Regulation (GDPR)
[2] *Article 9(2) (j))*
[3] *(Article 6(1)(e)*

Part 3 - Approval, Organising and Funding

Has this study been approved by a research ethics committee?

This study has been approved by the Trinity College Dublin Centre for Health Policy and Management/Centre for Global Health Research Ethics Committee. Ethical approval was granted on 30/10/2024 (REAMs No: 1926).

Who is organising and funding this study?

This study is part of Paul Leavy's PhD, funded by a Health Research Board (HRB) SPHeRE Scholarship (https://www.sphereprogramme.ie). The research will not be used for commercial purposes.

Will I be paid for taking part?

No, you will not be paid to take part in the study.

Part 5 - Further Information

What happens if I change my mind?

Your participation in this study is voluntary and you can change your mind even if the study has started.

You do not have to give a reason for changing your mind. This will not affect you in any way.

If you want to withdraw from the study, please contact the PI, Paul Leavy via leavypa@tcd.ie or +353 (0) 83 4265817, who can organise this for you.

We will discuss with you if you are happy for us to continue to use information about you which has already been collected. If you do not consent to your data being retained for this study, we will delete any information that could identify you.

Please note that we will not be able to remove personal data which has been shared or pooled for use in publication before your request for deletion.

We will not contact you again.

Who should I contact for information or concerns?

If you have any concerns or questions, you can contact:

Principal Investigator: Paul Leavy, leavypa@tcd.ie

If you have any questions in relation to your rights under data protection law, you can contact the Data Protection Officer, Trinity College Dublin: Data Protection Officer, Secretary's Office, Trinity College Dublin, Dublin 2, Ireland. Email: dataprotection@tcd.ie. Website: *www.dataprotection.ie.*

Under GDPR, if you are unsatisfied with how your data is being processed, you have the right to raise a concern with the Office of the Data Protection Commission, 21 Fitzwilliam Square South, Dublin 2, Ireland. Website: *www.dataprotection.ie.*

Part 6 - Next Steps

Will I be contacted again?

We will contact you in seven days to give you time to consider your participation in the study. If we do not hear back from you, we will contact you on another occasion, and if we do not hear from you after that, we will not contact you again.

If you would like to participate in this study, we will ask you to contact PI Paul Leavy, leavypa@tcd.ie, and you will be asked to sign the Consent Form on the next page.

Thank you

Thank you for taking the time to read this Participant Information Leaflet.

You will be given a copy of this Leaflet and the signed Consent Form to keep. Please retain these in case they are needed for future reference.

Appendix 20: Study 3: Realist Interview Study informed consent form

INFORMED CONSENT FORM

STUDY: How and why do health system factors impact on private general dentists participation in State-funded dental care in Ireland: a realist interview study

Recruitment Site: Centre for Health Policy and Management, Trinity College Dublin

There are **two sections** in this form.

Section 1 contains statements of understanding and asks you to tick each if you understand. Please ask any questions you may have when reading each of the statements.

Section 2 asks for your informed consent. Please select either 'yes' or 'no' to indicate your choice.

Thank you for participating.

The end of this form is for the researchers to complete.

1. General Understanding	Tick
I confirm that I have read and understood the Information Leaflet for the above study. The information has been fully explained to me and I have been able to ask questions, all of which have been answered to my satisfaction.	
I understand that taking part in this study is entirely voluntary. I understand that not taking part will have no negative impact on me.	
I understand that I can leave this study at any time without giving a reason. I understand that leaving this study will not affect me, now or in the future.	
I understand that I will not be paid for taking part in this study or receive any benefits as a result of this research study.	
I know how to contact the research team if I need to.	

By ticking each box above and choosing my options below <u>and</u> signing this document I agree to participate in this study as described in the Participant Information Leaflet.	
2. Consent	
I agree to take part in this research study, having been fully informed of the risks and benefits in the participant information leaflet provided to me.	**Yes** ☐ **No** ☐
I agree to the use of information about me (personal data) including information gathered during interviews being used by the research team for this research study as described in the participant information leaflet.	**Yes** ☐ **No** ☐

_____

Participant Name (Block Capitals) Participant Signature Date

To be completed by the Principal Investigator or nominee.

I, the undersigned, have taken the time to fully explain to the above participant the nature and purpose of this study in a way that they could understand.

I have explained the risks and possible benefits involved. I have invited them to ask questions on any aspect of the study that concerned them.

I have given a copy of the participant information leaflet and consent form to the participant with contact details of the study team.

Researcher name DR PAUL LEAVY

Title and qualifications PhD SCHOLAR. BDS, MSc, MDPH, MFDS RCSEd

Signature

Date DD/MM/YYYY

Contact details Email: leavypa@tcd.ie Phone: +353 83 4265817

Copies to be created and retained: 1 for Participant and 1 for PI

Appendix 21: Study 3: Realist Interview Study conceptual codes

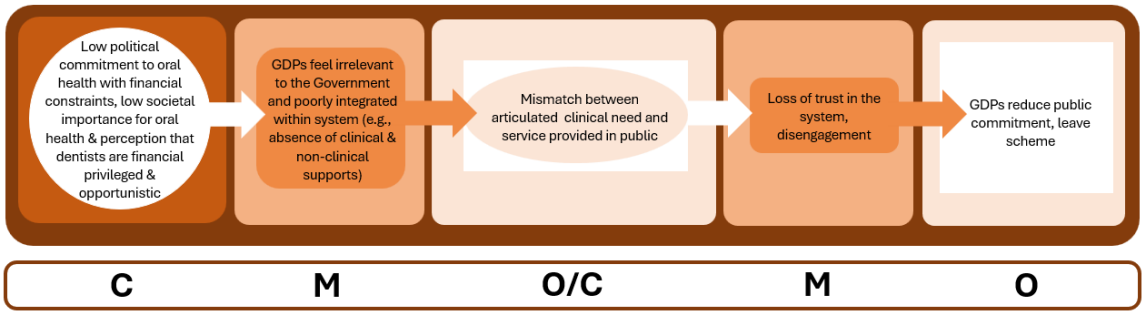
Nodes

Name	Files	References
Appreciation, recognition, valued	6	10
Autonomy, control	13	36
Burdensome admin, processes	8	14
Challenging patients	8	15
Communication, consultation	10	37
Consensus or collaboration	15	49
Dental corporates	4	5
DTSS grey areas, info deficit, inconsistencies	8	24
DTSS pressures	2	3
Early vs mid or end career dentists	9	20
High GMS population	4	5
How GDPs are perceived, eg by Govt	6	8
HSE Management, PDSs	11	29
HSE oversight, inspections	6	14
Clinical standards, guidelines	4	7
HSE, Govt Support	13	44
IDA	10	22
Influence of 'industry'	2	2
Leadership	4	4
Limited care on DTSS	8	29
Local to national control, contract	3	5
NOHP implementation	8	13
Outcome staying but limiting engagement	3	5
Political inertia or desire to change	7	22
Political or HSE priority for OH	11	32
UHCOH, Baskets of care	1	2
Postgraduate training	1	2
Private dental landscape	13	24
Probity, fraud, gaming	10	30
Professional networks	5	11
Professional view of DTSS	3	6
Public service ethos, alturism	9	15
Quality care or pride in work	5	8
Recession cuts	4	6
Remuneration, funding, income	16	38
Small or rural practices	9	15
Societal or patient value or importance on OH	10	23
Advocacy, lack of	1	1
Stuck between patient and HSE	6	8

Support		2	3
Tapping into GDPs' sense of being a HCW, part of system, PH approach		6	9
Trust, suspicion		9	20
Undergraduate training		6	8
Us and them		5	12
Work-lfe balance		2	2

Appendix 22: Study 3: Realist Interview Study illustrative data used to construct CMOCs (note, additional illustrative data were shared with PhD examiners)

CMOC 1: Political and resource commitment to oral health



Dentistry isn't a priority for people. It's very quickly a priority at the weekend if they're in trouble. And I think, I was really shocked during the recession when the PRSI scheme was cut right back, and the public didn't object. I thought that was, that was a great failure, actually, and I think, I think our public let us down. Now, why? I don't know, or maybe, maybe there, maybe there needed to be an unseen hand there that that encouraged them to to object. Maybe we should have worked through unions or something, but we didn't. But that was, that was shocking – Interviewee 14

And in the end of the day, there's almost no political capital from an improved primary prevention system, and there's huge political capital cutting the tape on a new hospital facility. And you know that I think we are still a long way from having an understanding as a population of what a good health service would look like, because it's so focused on the visible crises in the dysfunction of the current arrangements, as opposed to being a pathway to improved functioning across all levels in the system – Interviewee 2

Dentistry is of no importance whatsoever to government and..... I think it's it's proven in the fact, of the funding for it like you know what I mean that there is.....it's been allowed to kind of stagnate, just wither on the vine like you know – Interviewee 17

I think the budget in 2010 - they took kind of a guillotine to the to the public dental schemes, both of them, overnight. And I think a lot of the professionals would have compared themselves to other, you know, maybe, if you look at medical GPs, because pharmacies, you know, those cuts, dental was, you know, disproportionately impacted so they were, you know, ditched by the government effectively in in 2010 so back then we have the bad, recessionary times and private practices, I personally, you know, really, really struggling with, with an overnight reduction of 70% of their budgets – Interviewee 5

And then we have the COVID 19. And we have the, for instance, you know, in Scotland, they paid NHS dentists their supports through COVID and for a significant time after, just to make sure that they retained interest in terms of practicing NHS dentistry. And here, not only were there an absence of supports, but this the PPE element. It sounds like a small thing, but in the grand scheme of things, it was a mark of disrespect, I think that was felt by a lot of dentists, and in terms of their isolation. And then this whole question of, you know, closing my practice, what am I going to do? Is this essential dentistry? What's essential dentistry? When am I opening? No guidance, no

support from either of the institutions in the health system and then, you know, you re-enter 'normal life' again, and you have no update on fee schedule, really – Interviewee 5

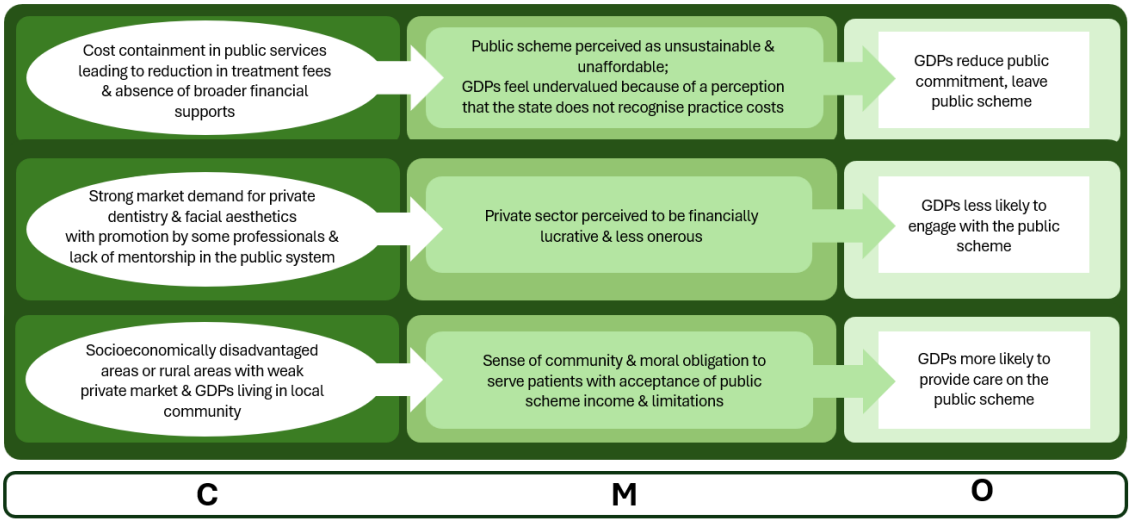
You are a country, and I suggest you go to the World Bank data, which is per capita in terms of GDP, one of the best paid in Europe and your government has consistently refused to fund decent or healthcare, and that, to me, is an utter disgrace – Interviewee 11

I think there was, you know, there was a promise of, this was actually a thing that got people very annoyed - there was a promise of PPE during COVID. You had to, you know, declare that you were a medical card practitioner and you were promised PPE. That never materialized. And I think that was the last straw for a lot of people, but it was certainly a big problem for me. I mean, I could, I had my own PPE, and I could get my own PPE, and I was planning for it, and I was okay, but the fact that, you know, we weren't relevant in the whole scheme of things, was quite difficult, and I think that was a turning point for a lot of people – Interviewee 19

But I think a lot of them have left the scheme because there's no there's also a lack of support or acknowledgement from us in the HSE, we no longer have local monitoring committees – Interviewee 3

And so, yeah, I mean, there's so many issues, and then lack of places to refer, you know, like there's very ad hoc arrangements and for referrals, and it's different. What we have here is different to what I had in [REGION]. And in some areas, there's nowhere to refer patients. So if you have an oral surgery case or a complex root canal treatment or, you know, there's nowhere to go, and there's no funding for that. So I think the whole, the whole system is just, is just inadequate – Interviewee 9

CMOC 2: Financing and market dynamics



Yeah, I mean the fees, it's getting to the lower end, you know, of.... I mean, when it was 50 euros for a composite, just a small few years ago, I was just, you know, I was feeling very, you know, a lot of antipathy towards the scheme. But when up to 80 all was forgiven, you know...but its starting to feel a bit painful again – Interviewee 16

When it starts costing them money to provide this service, then it becomes unsustainable and that's what happened with regards to some dentists that left the scheme. But if they are still kind of making, and at the end of the day the dentistry's a business as well as being a healthcare profession, if it doesn't make business sense for dentists to do something (laughs) you know you're going to have difficulty to get them to do it, you know, so it has to make business sense – Interviewee 1

I'd say the third thing that's reduced it is that there's easier money elsewhere with Botox, and actually quite a lot of you know, a lot of practices that I visit now are doing Botox as well. So they're spending their time, essentially wasting their time doing this thing. But it's lucrative. It's not dentistry – Interviewee 18

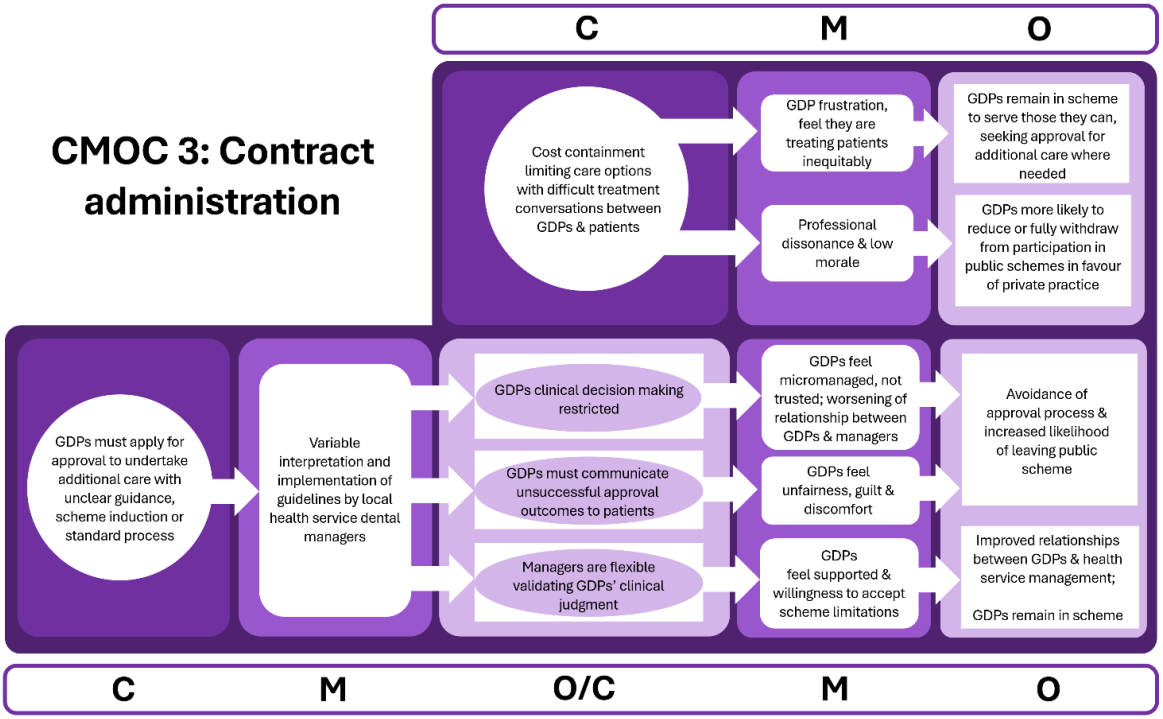
People are interested in the 'white/shiny'..... they would pay money for the 'white/shiny' so, and it's not that there's anything wrong with actually having a nice white smile or having nice straight teeth, but it's easier money than dealing with the provision of treatment for gum disease, treatment for dental caries, and trying to improve people's actual physical oral health– Interviewee 10

The context still plays into this, I think. So you'll do it, and you'll suck it up if you have no other patients coming in the door. So, you know, we would have happily seen medical card patients and been delighted to have the guaranteed money come into the bank when the economy was poor and when there wasn't a lot of private practice business, and when the wheel starts to shift to when you have another option, then, you know, it becomes far more appetizing to say, okay, look, why am I bothering?– Interviewee 5

Ah yeah, I mean, I would have left the scheme if I could, but I can't, because of my location, you know (laughs). But, you know, I think ..what I'm finding later in life is.... you know, the most satisfying part of the job is giving everybody access, you know what I mean. Its....now look,....I can't leave the scheme, so I'm not Mother Theresa but I'm kinda, I'm trying to.....reflect....on.....you know....and it's the hard cases..they're coming down, they cant... I mean, it would be tragic if these people didn't have access locally.... to the scheme. And... you know.... it is.... it is satisfying. More

satisfying than if you just did your private work…its just going, is just going wow, can we operate the scheme… that worked very smoothly for that person…that's another happy customer. And also, I think maybe in universities, people should, you know, students and someone came in and said, look the state has…..subsidised a huge sum of your training to become a dentist …to the tune of 100s of 1000s. So….. you do have an obligation to the state as well to be sympathetic to those on the schemes. That's something I get now…the state did subsidise my education a huge amount. So we have a mutual obligation to the state…its just another little thing I tell myself of myself to get me through the day – Interviewee 16

I think if I answered it initially, the opposite, why are why is anyone staying? I think the majority of people who are staying are staying out of a moral obligation, because they feel, particularly if they're in small towns, they feel like they've treated these people for years. They just can't go off the medical card. There's nobody else who are going to be who's going to take these patients, you know, and like, I know, a few practices, and there are dentists who are well off financially and are years working, and they say they financially, they're not making money on the medical card holders, but they just would feel too bad to leave it. So they're staying for moral reasons - some people – Interviewee 9



I certainly went into dentistry to try and A) do the right thing, and B) help people. And if, if you're hampered in your ability to do that, that's very difficult.... it's extremely challenging not to be able to give the patients the care that A) you want and B) they need. Very challenging. You know, particularly when patients can't afford it. That's one of the reasons I've continued with the medical card scheme – Interviewee 19

I think that being in a situation when, when, when it was reduced to two fillings per year like it just, you know it it really it really it was terrible really. It it it just, you know you were leaving active disease like and you were telling patients there's active disease here. There's active caries, there's active gum disease and then you know a lot of these patients may have lost some teeth and then perversely then they were looking for a partial denture or they were looking for you know, and and none of the research supports putting a partial denture into a mouth with active disease. And you know, you just, it was just soul destroying – Interviewee 17

Well, it wears you down, and it takes them a lot of time, you know. So it's, it's time that could be spent discussing patients issues or problems, or, you know, potential treatment options. Instead of discussing all that positive stuff or preventive regimes, instead of doing that, we're explaining a system that is not fit for purpose, you know. And that's not really what we're there for, you know? – Interviewee 8

Information is a big problem here, because they get the medical card and they don't know what they're entitled to. They go into the dentist, and the dentist says you'll only get that if the HSE approves it, and you won't get that because it's not available on the scheme, and they don't know where that's written down. They don't have any information. They go looking online, they can't find it, and then they get annoyed. And then the HSE may decide, the local principal, may decide, I'm not going to approve it. Then they're going, 'well, I want, I can't afford, I'm not going to pay for this'. Then they want to appeal it. There's no appeals mechanism. Where does that go, you know. And so the poor old clinician is left with it is the person who's dealing with the irate patient – Interviewee 3

Another thing is sending for approval. That's annoying. You know, that's that's pretty annoying. It's like, why do I have to send for approval? If a patient needs dentures, they need the dentures. If their dentures are poor fitting, they're rocking in their mouth, they should get a new set of dentures,

regardless of them being made in the last five years or not. So I definitely think the sending for approval is annoying. It's not the worst, but it does get the way it makes you feel like you're not in control of the treatment. Someone always up there, 'micromanaging' everything. It's annoying – Interviewee 13

Yeah, again, it kind of reminds me of when the principal dentist was suggesting a filling didn't need doing.... very annoying, but it was only briefly there. But yes, I would find it very annoying if they said, they were saying, you know, why don't you go for a full denture here instead of a partial so....but luckily, they don't seem to do that, you know. But that would be, if.. that would be my take on that would be, that would be a 'no, no', you know, if they were being a bit too.... 'oversight-y' on clinical decisions. How do they do that remotely? Do you know what I mean....very annoying – Interviewee 16

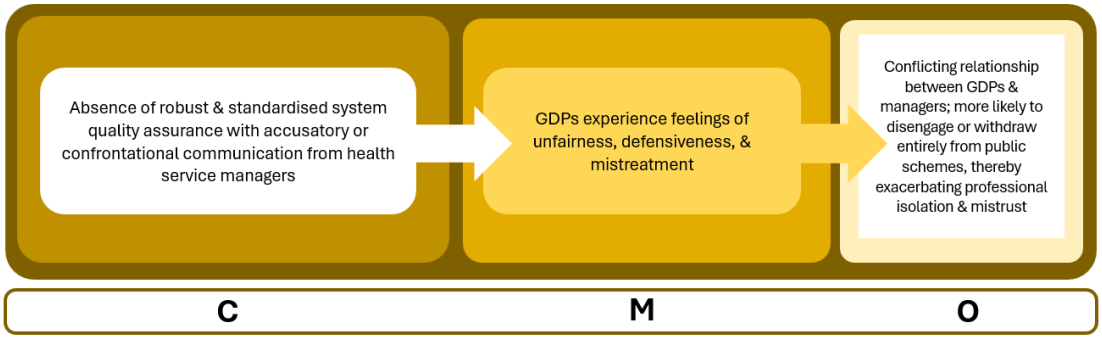
I think probably the rigidity of it and the paperwork involved is probably something as well. It was the reason I never really got into it, because my local principal was a thorny sort of a person, and the applying for approval for certain treatments, I was fairly sure would have run into problems. So, yeah, the red tape, I think, as well, dentists tend to be quite strong, strong headed people, in my experience, and they don't like being told what they can and can't do – Interviewee 8

Someone 'up there' is saying, 'No'... they're not approving, you know, and like, it leaves it in your hands to deliver that news to the patient. It's unfair, because you know the patient needs the treatment and they're not getting it, and it's unfair on the dentist to be like, 'Oh I'm so sorry you weren't approved for the treatment. You have to pay X amount of money to get it on the private scheme'. You know, it's really annoying. So that definitely is... it can lead to the GDP feeling lost, a lack of clinical autonomy, it, it makes you feel like I'm being 'micromanaged', and it's, like I'm self employed, you know, I'm a dentist, and I'm self employed. I shouldn't be feeling like I'm being micromanaged. But it does make you feel like you are being micromanaged, like every decision you're making is being honed in, does the does the person, does the patient deserve this, or are they eligible for this or not? That's not fair – Interviewee 13

I am inclined to ensure that within what they are eligible to provide, that there is as little restriction or limitation or hindrance on our behalf put on those dentists as possible. Because, you know, we are trying to keep the last man, you know, the last man standing, in effect. But you know, the HSE aren't stupid, the principals know that we're at the mercy of the dentists. And so I would be very surprised if, if you looked nationally, although there may be variability, I think there will certainly be a lot of, kind of, really serious efforts made to try and keep this moving as quickly as possible, because otherwise it falls back on the HSE. And I think ultimately that maybe is what needs to happen. But that's maybe a different discussion – Interviewee 5

No, no guidance is given. Do you know what I mean? There's no guidance given to you. They send you a booklet and then a few sheets in your application form back, but there's no real, actual guidance when you're reading the booklet, you know exactly what is going to be approved or not. I feel like they keep that very hidden. I'm not sure, but I do feel like they keep it 'under wraps', and they approve whatever they think should be approved, which is not really nice. But I heard that from my nurses, actually, who have been in the practice for long, working with other dentists. And they would tell me, put down any systemic disease, put down that they have diabetes or depression or, I don't know, you know. But in the first few, three to four months, it was in my head, I was like, two fillings only, and I'm really sorry, etc, but I didn't realize they would actually approve some" – Interviewee 13

CMOC 4: Quality assurance (probity)



And I think that broad, sweeping letters, sometimes with confrontational statements in them. Sometimes, I have heard a couple of people to be more kind of, I suppose, dental colleagues who I know from kind of college years or whatever, saying 'that letter now has finished me, I'm leaving' – Interviewee 9

I think people are, and if I didn't say it earlier, I think people are more inclined actually, to leave the medical card scheme because they are fed up with the HSE.... than with the dentistry. They also, you know, people have said they were fed up they weren't getting paid on time. People have said that they were fed up with, like, you know, these kind of probity questions coming at dentists who were good dentists, who were not messing the system, you know – Interviewee 9

there was an examining dentist scheme that, you know was starting..... I know most of the dentists involved in the examining dentist scheme when they were very frustrated like that they could see that that, this would be fruitful and they were trained, etcetera and this was a, this was a big hope for the profession as well, like, but that fell away as well, like you know, so – Interviewee 17

Now, there was a time when, I think the contractors, the dentists that were providing the DTSS, there was a time when there were a little bit more consultation was going on, there was a little bit more feedback to them. But now I think the only feedback they get is maybe a letter from us in the inspectorate asking them to explain, you know, certain things under claim, claiming patterns, or a phone call asking them to explain or to answer to a complaint, you know – Interviewee 3

But I think if you had a more low level advisory kind of , the HSE had a more, came in at that little bit, worked with the clinicians, you know, and there was a little bit more, I don't like 'peer review', but a little bit more kind of informal- formal kind of relationship. The scheme would work better – Interviewee 3

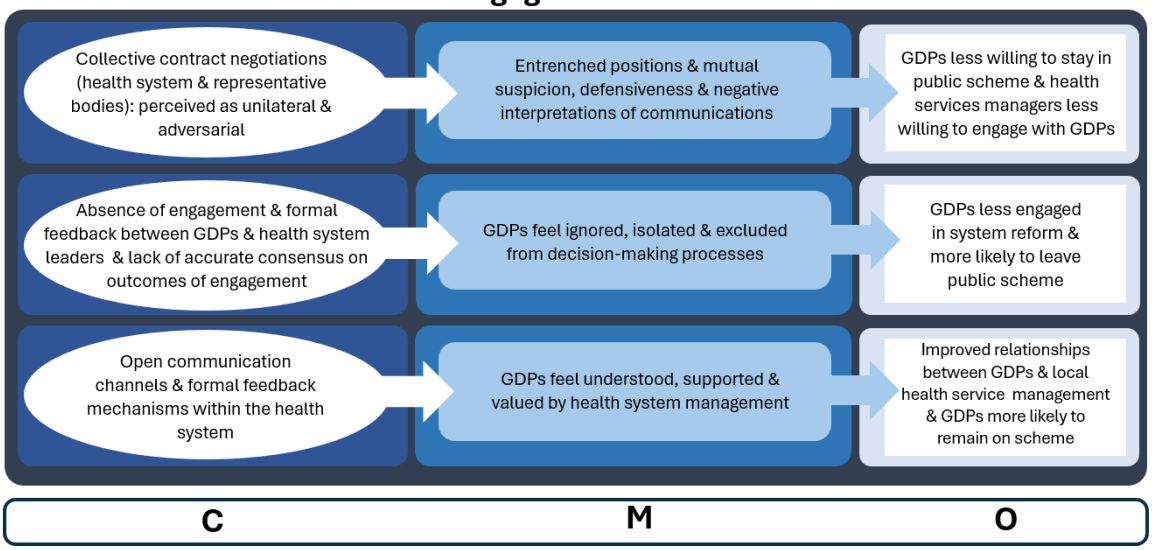
People have said that they were fed up with, like, you know, these kind of probity questions coming at dentists who were good dentists, who were not messing the system, you know. And so, you know, I feel, yeah, despondency, with the HSE, feeling that they weren't heard, 'Nobody's listening to us', 'We're not supported', 'I'm fed up with this', 'Now I'm going' – Interviewee 9

It was never set up like that. You know, there were, this was contracted out, and it was always a 'them and us' sort of scenario. And you know, the HSE, it's an adversarial relationship in a lot of cases. Yes, you know, that's kind of watching what people are claiming – Interviewee 9

But when you're looking at the finance data in the DTSS, there was absolutely no doubt whatsoever that some of the trends of surgical versus non-surgical extractions were pointing towards over claiming for surgical extractions, you know, 100% surgical extractions versus zero. Now, how that was managed, and the language around it, and the interactions with the people, the 'people side' of

dealing with that probity……may not have been as positively managed, for want of a better description, as it might have been – Interviewee 10

CMOC 5: Communication and engagement



And I've heard, I've heard it from people who were in negotiations with, I think it was the HSE at the time, and the conversation that was alleged was that at the start of the meeting, the HSE people said, 'right, well, we can this is what's on the table, and we can talk about it for a week, but nothing in is going to go on the table other than what we're putting on the table now. So you can take it or leave it, or we can sit here for a week and talk about what you want to do' so that, like, that's that came from somebody who was there. They didn't have a particular reason for telling me that story, that they were there. That's what happened. So if that's, if that's the level, you can see where mistrust, you know. So the mistrust from the health HSE side came from what I would perceive to be there, their perception anyway, of over claiming and abuse of the system, and then the mistrust on the dental side. What was well, like this just, we're just getting told that this is happening and there's nothing we can do about it. So, yeah, communication – Interviewee 8

I can understand dentist getting demotivated. Demotivated because my experience of the means of communication, of changes in this game, it's not always great. Hasn't been great. It's been kind of, 'well, here you go', 'This is what's happening, if you think you can do anything about good luck to you' – Interviewee 8

I suppose...I think there needs to be, how would I put this, there needs to be more cross contamination between the public sector and the private sector There needs to be a lot more communication on both sides. This kind of everyone sticking to their own side of the fence is not helpful for anybody. That's my own feeling. Just whether it's a lack of trust or a lack of communication or a lack of openness on either or both sides that part, I can't really figure out, but I do know there's a big divide, and there is a lack of understanding on both sides of the fence – Interviewee 19

And I mean, I think, I think the clinicians, they've been so much pushed out of any kind of consultative process in my mind, that I kind of understand why some of them have left the scheme, you know – Interviewee 3

And then I think maybe a little bit of ownership over a system change, you know, like they are so isolated in terms of development of policy in terms of, you know, the PPE crisis and controversy during COVID, and I think that was, you know, again, a key kind of turning point in terms of their engagement with the system. I think a lot of the, you the best place to advise, but this idea of a

shared ownership over a system will give you some kind of pride in the system and kind of a responsibility to it – Interviewee 5

And I think there must be a responsibility on dentists also to be willing to engage and to be willing to at least have a discussion with.... if the opportunity is offered to them. I think the issue is that the opportunity maybe has not been offered to them, or maybe, I don't know, I'm not privy to that information, but I do think you know, there can be an attitude of, 'I want everything, but I'm not going to, you know, really engage at any meaningful level either'. You know, change is difficult for everybody. We can't have everything in a publicly funded scheme. It's not going to work like that. We should be considered, and we should be part of the of the process.... so I think it's a really.... at the minute, I think it's quite a fractured environment – Interviewee 5

I actually found the relationship, I could pick up the phone and have the chat, which was a big help - having a conversation, a direct conversation by phone helps enormously for everyone to know exactly where everybody else is up to. Yeah, I would be a great believer in picking up the phone and having a chat – Interviewee 19

Appendix 23: Published Works

Leavy *et al. BMC Health Services Research* (2025) 25:802
https://doi.org/10.1186/s12913-025-12884-6

BMC Health Services Research

RESEARCH Open Access

Primary oral healthcare in Ireland: a health systems analysis of publicly funded contracted services delivered by the general dental practitioner workforce

Paul Leavy[1*], Pádraic Fleming[2], Blánaid Daly[3], Sarah Barry[4] and Sara Burke[1]

Abstract

Background In recent years, Ireland has seen a decline in the number of private general dental practitioner (GDP) contractors delivering state funded dental care. Meanwhile, the National Oral Health Policy – *Smile agus Sláinte*, proposes contracting more state funded care to private GDPs including care for all children and vulnerable adults. Understanding Irish GDP workforce characteristics will be key in evaluating services and informing workforce planning into the future. This study describes the primary oral healthcare system and GDP workforce indicators in Ireland and compares private GDPs by current state dental scheme participation.

Methods Documentary analysis was used to describe and trace the origins of Ireland's current primary oral healthcare services. Secondary analysis of publicly available data was undertaken to map GDP workforce indicators to critical dimensions of the World Health Organization (WHO) 'Dimensions of Universal Health Coverage (UHC) relating to Human Resources for Health' framework. Private GDPs were compared by state dental scheme participation utilising available demographics. Descriptive statistics were computed using STATA/SE 17 software.

Results Private GDP contractors have participated in the delivery of state-funded dental care in Ireland since the early 1950s. The number of private GDPs holding Dental Treatment Services Scheme (DTSS) contracts fell from 1,664 in 2016 to 787 in August 2023, while the number holding Dental Treatment Benefit Scheme (DTBS) contracts increased from 1,959 in 2016 to 2,384 in 2023. The number of private GDPs submitting claims on the DTSS has also declined from 1,318 in 2016 to 831 in 2022. DTSS contractors are more likely to be male and qualified longer (> 20 years) than GDPs holding only DTBS contracts.

Conclusion These findings are very relevant and timely to the planned policy implementation given that *Smile agus Sláinte* is reliant on the greater provision of publicly funded care by private GDPs. There is a potential lack of GDP supply into the public system as the Irish Government seeks to implement *Smile agus Sláinte* and meet its WHO obligations on developing UHC for oral health.

*Correspondence:
Paul Leavy
leavypa@tcd.ie

Full list of author information is available at the end of the article

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Keywords Dentistry, Oral health, Workforce, Policy, Ireland

Background

To function adequately and ensure timely access to care for patients, health systems rely on the workforce, also known as 'human resources for health' (HRH) [1]. The workforce is recognised as one of the six 'building blocks' of health systems, alongside service delivery; information; medical products, vaccines and technologies; financing; and leadership and governance [2]. Recruitment and retention of HRH is a worldwide challenge and the World Health Organization (WHO) estimates that by 2030, there will be a shortfall of 10 million healthcare workers globally [3]. Many factors are associated with HRH shortages including healthcare worker migration and a failure to invest in education and training [3, 4].

As members of the dental team, dentists, alongside other dental healthcare professionals (e.g., dental hygienists) play an important role in ensuring individuals achieve their optimal oral health and by extension, overall health and quality of life (QoL) [5, 6]. Oral healthcare services are primarily delivered in primary care settings, namely private general dental practices and public dental services operated directly by state health authorities [7].

In 2022, United Nations (UN) member states agreed to adopt the WHO's global strategy on oral health with an emphasis on developing universal health coverage (UHC) for oral health, reaching all communities by 2030 [8, 9]. A strategic aim outlined in the WHO draft global strategy on oral health (2022) is *"to ensure that there is an adequate number, availability and distribution of skilled health workers to deliver an essential package of oral health services to meet population needs"* [9]. To deliver on this, health systems will need to enhance the capacity of their oral health workforce [10]. In Europe, some jurisdictions have already achieved partial or comprehensive UHC for oral health, most notably targeting children and other vulnerable groups [10]. There remains, however, widespread variability in levels of statutory dental care cover for the wider population with an estimated two thirds of care funded by 'out-of-pocket' payments or voluntary private health insurance in Europe [10]. Many health systems employ models of contracting state-funded dental care to independent, private general dental practitioners (GDPs) and their teams, for example, the National Health Service (NHS) across the United Kingdom (UK) [11–14]. Contracting with private providers is advocated for in the WHO global strategy and action plan on oral health 2023–2030 (2024) [15] and is reliant upon on a steady supply of dentists opting into and remaining in such schemes.

Healthcare in Ireland

Ireland is a European Union (EU) member state located in western Europe. In 2023, the estimated population was 5.3 million, an increase of almost 100,000 on 2022 [16]. Ireland's population is projected to increase by between 500,000 and 1.8 million by 2057 owing to natural increase and net inward migration [17]. Ireland's population is ageing, with the proportion aged 45 and over increasing from 35.5% in 2013 to 40.6% in 2023 [16]. The Irish healthcare system comprises a mix of public and private financing and delivery and is often described as 'complex'. The national public health and social care provider is the Health Service Executive (HSE) which was established in 2005, replacing regional Health Boards [18]. There is no entitlement to universal primary healthcare and eligibility varies based on age, residency and means. Broadly speaking, one third of the population ('medical card' holders) are entitled to free or subsidised services while the remaining two third have fewer entitlements and must fund the majority of care through 'out of pocket' payments or voluntary private health insurance [19]. Ireland is the only country in western Europe that does not provide free or subsidised GP care for the majority of the population [19]. Published in 2017, the whole-of-government *Sláintecare Report* sets out a ten year plan to deliver major system-wide reform including the achievement of UHC in Ireland [20].

Oral health policy and workforce in Ireland

For decades, oral health policy and care provision have not been political priorities in Ireland [21]. Currently, there are three separate state-funded primary dental care services, each targeting different population cohorts; the Public Dental Service (PDS), Dental Treatment Services Scheme (DTSS) and Dental Treatment Benefit Scheme (DTBS). The latter two serve the adult population and are delivered by private GDP contractors [22–24]. The current system is fragmented and does not cover the entire population leaving many with restricted access to routine oral healthcare including very young children [25].

Published in 2019, Ireland's National Oral Health Policy (NOHP) titled *Smile agus Sláinte ('Smile and Health')* proposes contracting more state funded care to private GDPs including care for all children and vulnerable adults [25]. The NOHP specifically highlights the need to increase access to routine primary oral healthcare for children under six, by establishing 'dental homes' in general dental practice where prevention is embedded from infancy. Through this approach, the policy aims to reduce the one third (33%) of children with caries in their deciduous (primary) teeth by age six and lessen

the demand for costly dental general anaesthesia (DGA) for extractions. Recognising Ireland's aging population, the policy also outlines challenges associated with care access and uptake among adults and older adults. The NOHP highlights the maldistribution of dentists across the state and lack of sufficient access to care among older adults living in remote, rural and western coastal areas where fewer early career dentists work. As adults retain their own functional dentition into old age, the policy seeks to increase access to preventative and restorative care and oral cancer screening among this group in local dental practices. Having sufficient numbers of publicly contracted privately practising dentists is central to the policy's implementation.

In recent years, the number of private GDPs delivering state funded care has fallen with reported reasons including suboptimal remuneration, contractual constraints that impede clinicians' autonomy and burdensome administration [21]. Recruitment and retention challenges in dentistry are not unique to Ireland. A recently published scoping review found many of the same factors were responsible for UK GDPs leaving NHS dentistry [26]. There is recognition that a suitably trained workforce and sufficient HRH capacity will be required to deliver future state funded dental services in Ireland, along with accurate oral health needs assessments and public and professional agreement on priorities [25]. Understanding the workforce; its composition, characteristics and distribution through robust and contemporaneous data collection is key in evaluating services and informing workforce planning into the future.

The WHO *Global Strategy on Human Resources for Health 2030* makes the case for strengthening and monitoring of workforce data as member states implement healthcare strategies and policies [27]. While HRH supply is an important indicator of effective healthcare coverage, it is regarded as insufficient on its own for workforce planning purposes, especially when considering not only population ratios, but the complexities of population health needs and demands, evolving healthcare delivery models and emergency scenarios [27, 28]. The WHO recommends a more nuanced approach to HRH appraisal and planning including assessment of the equitable distribution and accessibility of the workforce, its competencies, and acceptability to the population's sociocultural expectations [27]. The WHO argues that only when these criteria are met, and when the workforce is sufficiently supported by the health system, can theoretical health coverage truly translate into effective coverage [27].

Research objectives

This study is a health systems analysis of the Irish private GDP workforce which is contracted to provide publicly funded primary oral healthcare services, an area not previously explored.

The objectives are:

1) to describe current state funded primary oral healthcare services in Ireland and their origins
2) to identify and map GDP workforce indicators specific to state-funded, contracted primary oral healthcare in the Irish context and
3) to compare the distribution and characteristics of GDPs in Ireland by current state scheme participation, with an emphasis on rural and western coastal counties.

Ethical approval was not required for this research as it utilises publicly available data and all results presented are anonymised.

Methods

This health systems analysis comprises a documentary analysis and a separate, secondary data analysis (Fig. 1).

Documentary analysis

Documentary analysis was used to describe and trace the origins of Ireland's current primary oral healthcare services. We drew upon a range of documents identified through online searches of websites including the HSE, Government of Ireland including the Departments of Health (DoH) and Social Protection (DSP) respectively; the Lenus database (the Irish Health Research Repository) and the electronic Irish Statute Book. Twenty-seven documents were retrieved spanning the period 1952 to 2023. These included websites ($n = 8$), health service documents ($n = 4$), health policy documents ($n = 3$), government reports ($n = 3$), other reports ($n = 3$), journal articles ($n = 3$) and Acts of the Oireachtas (Irish Parliament) ($n = 3$).

Secondary data analysis

Conceptual framework

We utilised the WHO Dimensions of health workforce coverage ('AAAQ') framework to identify and characterise available GDP workforce indicators in Ireland (Fig. 2) [29]. Developed by Campbell and colleagues, and adapted from the UHC 'cube' [30], the framework integrates Tanahashi's model for health coverage and the right to health and outlines the key components of effective UHC as they relate to the health workforce namely: availability, accessibility, acceptability, quality and service utilisation. To provide accessible care, adequate availability of

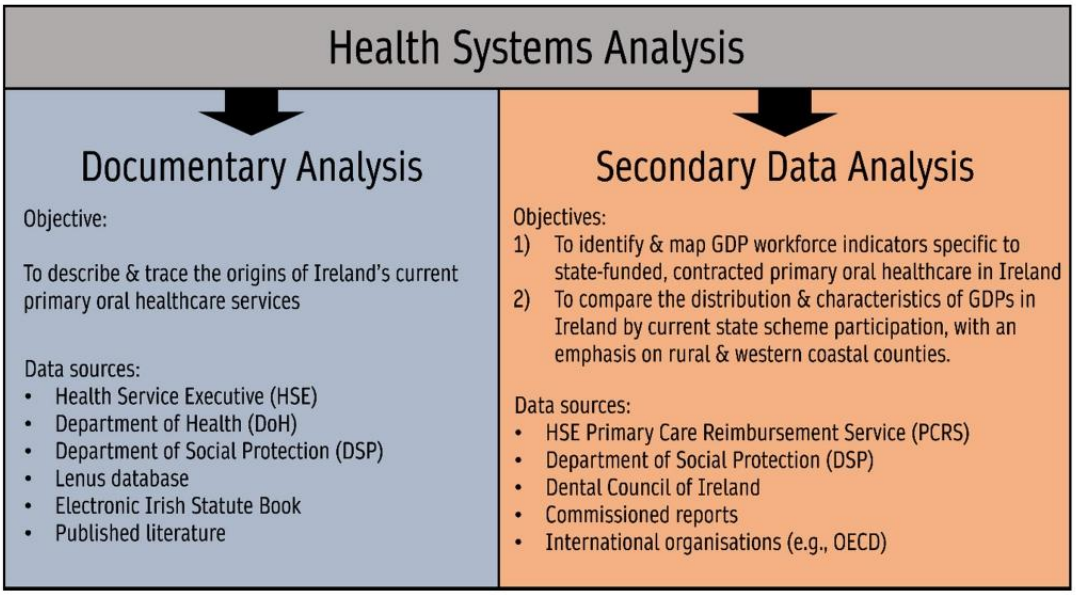

Fig. 1 Health systems analysis: over-arching methodology

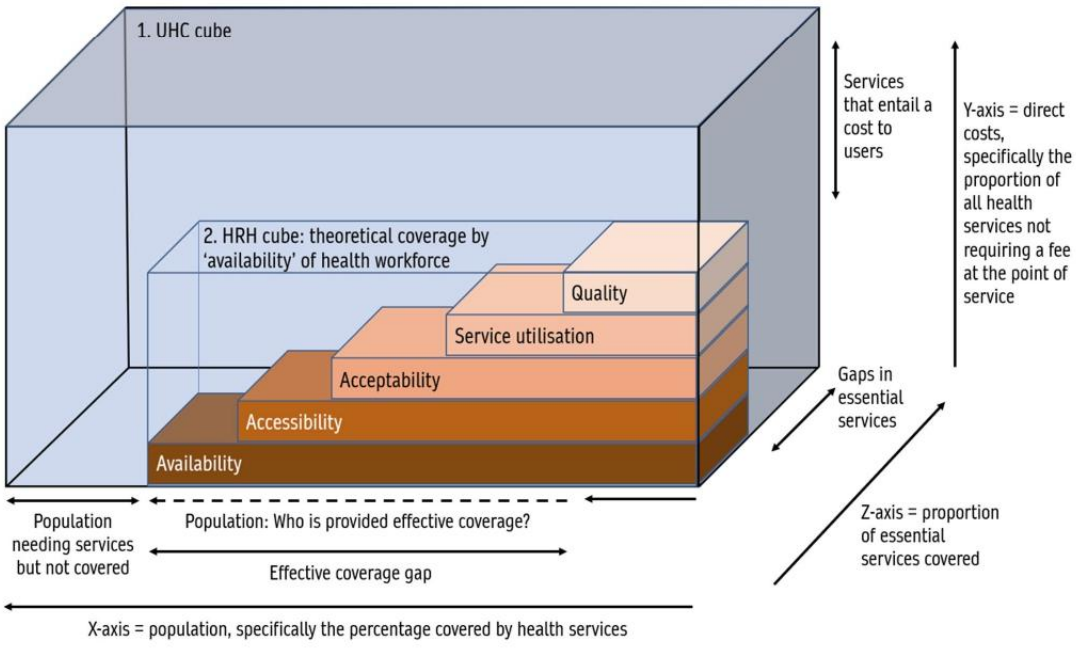

Fig. 2 Dimensions of universal health coverage (UHC) relating to human resources for health (HRH): effective coverage. Adapted from Campbell et al. [29]

healthcare workers is required, and acceptability enables accessibility [27].

Secondary data analysis (SDA) is the use of data created by another researcher or collector to conduct a study with a different purpose from the original study [31]. SDA of publicly available data was conducted to identify and describe GDP workforce indicators in Ireland and to utilise these to compare contract holders by state scheme. We analysed 15 years of data, from 2008 to 2023. This date range was selected as it coincides with global events impacting on the Irish health system, namely the 'financial crisis and austerity era' (2008–2014) during which there were significant budgetary cuts to dental services, the 'recovery period' (2015–2019), the 'COVID-19 pandemic era' (2020–2022) and more recently the 'inflationary period' compounded by the Russian invasion of Ukraine (2022-present), an approach used in other health system workforce analyses [32].

Data sources

Several data sources were utilised to identify indicators including GDP characteristics, distribution, and activity nationally. These included the HSE Primary Care Reimbursement Service (PCRS) website and reports, DSP website, Dental Council of Ireland register of dentists, commissioned reports, international organisations' websites, for example OECD Stat. Where incomplete datasets were identified, primary data holders were contacted by email and requests made to signpost to or to make these available as personal communications. Full details of data sources are contained within Table 2 in the results below.

Analysis

Following extraction from primary sources, GDP contractor data were cross tabulated with the Dental Council register, cleansed, and manually merged into a single master database using Excel 2016 software (Microsoft Corp, WA, USA). Collated data relevant to individual GDP contractors included names, practice addresses and telephone numbers, sex, DTSS and DTBS contract numbers, year, and place of primary dental qualification. Where incomplete records were identified, namely partial practice addresses, supplementary online searches were conducted using Google and the Eircode (postcode) Address Finder using available information, e.g., practice telephone numbers to complete individual GDP records [33].

To map and compare the distribution of public contracts, practice addresses linked to contract numbers were assigned an urban-rural and deprivation index classification using the Central Statistics Office (CSO) Urban and Rural Life in Ireland and Pobal HP Deprivation Index for Small Areas online mapping tools respectively [34, 35]. Using Google Maps, we also assessed accessibility for wheelchair users for each individual practice identified in our sample [36]. For manageability, and to allow for a comparison of contract distribution across the state, including in rural and coastal areas, we chose two geographical footprints congruent with the new HSE Health Regions: Dublin and Midlands (D&M) (population 989,000) and West and Northwest (W&NW) (population 760,139). These areas capture several counties across the east, midlands, west and northwest of Ireland. They include part of Ireland's capital and largest city - Dublin, satellite and independent towns, and remote, rural, and western seaboard areas which are highlighted in the NOHP as workforce and access blackspots. These regions also include some of the least and most deprived areas in the state. Clinician level indicators (sex, years qualified and place of qualification) were used to compare the characteristics of GDPs by types of contracts held. Descriptive statistics were computed using STATA/SE 17 software (StataCorp LLC, TX, USA).

Results

Primary oral healthcare in Ireland: system overview and development

Like the general healthcare system, Ireland's oral healthcare system is described as 'hybrid', with services delivered through a mix of private and public providers [37]. However, the majority of dental care in Ireland is delivered by GDPs working in independent ('private') dental practices and paid for privately i.e. 'out of pocket' [38]. In 2023 there were three state funded primary care services in Ireland (Table 1) as well as secondary (specialist-level) and tertiary (highly specialised) dental care delivered primarily by university dental teaching hospitals in Dublin and Cork [39, 40]. Acceptance criteria for care in these hospitals is primarily for educational purposes. An overview of the oral healthcare system and theoretical population coverage (eligibility) is provided in Fig. 3. It must be noted however, that theoretical coverage does not automatically translate into access to care. One notable example is the HSE PDS which technically offers comprehensive care to targeted age groups only, however in reality there is large variability in service provision and access throughout the state [21].

The PDS is operated directly by the HSE and delivered by teams of salaried dental professionals. As of August 2023, there were 295 whole-time equivalent (WTE) dentists and 59 WTE dental hygienists employed by the PDS [49]. Supplementing the PDS are specialist referral services including HSE orthodontics, oral surgery, and general anaesthetic services [50].

The two contracted state schemes serve different populations. The DTSS offers adults over 16 who hold a medical card a limited range of routine and urgent treatments

Table 1 Primary oral healthcare services in Ireland

	HSE Public Dental Service (PDS)	HSE Dental Treatment Services Scheme (DTSS)	DSP Dental Treatment Benefit Scheme (DTBS)	No public cover
Eligible population *Note: In 2022, the population of Ireland was 5.1 million* [34]	1.08 m children aged 0–16 [41]. Some adults with special needs or additional vulnerabilities (no exact number available).	1.29 m adult medical card holders aged > 16 years (2023) [42].	2.25 m insured workers and their adult dependents (2023) [43].	~ 500,000 (estimate) Individuals and families who can afford to pay out of pocket.
Annual expenditure	€135 m* (2023) [44] (*estimate, figure includes funding for HSE PDS orthodontic services)	€64.7 m (2023) [42]	€57.2 m (2022) [45]	€491 m* (2022) [46] *Household out of pocket payments
Treatments covered	Oral examination and single course of comprehensive care to achieve or maintain oral health. Target age groups only (children aged 7–8 and 11–12). Some special needs groups [21]. Urgent dental care (includes some medical card holders unable to access care on DTSS). Free at point of use.	Without prior approval: annual oral examination, prophylaxis ('scale & polish'), 2 fillings, any extractions, denture repairs, 1 st stage root canal therapy, other emergency care [47]. With prior approval: dentures, 2nd stage root canal therapy (front teeth only), apicectomy, protracted periodontal care [47]. Free at point of use.	Free annual oral examination and part-subsidised* prophylaxis ('scale & polish') or protracted periodontal care [43]. *Patients pay the balance where the cost of prophylaxis or periodontal treatment exceeds €42. Excess payment is capped at €15 for prophylaxis, no cap on periodontal treatment excess payment.	All treatments including cosmetic dentistry and facial aesthetics.
Workforce	Salaried public dentists & other dental healthcare professionals (e.g., hygienists)	Private GDP contractors and their teams	Private GDP contractors and their teams	Private GDPs and specialist dental practitioners and their teams

HSE Health Service Executive, *DSP* Department of Social Protection, *GDP* General Dental Practitioner

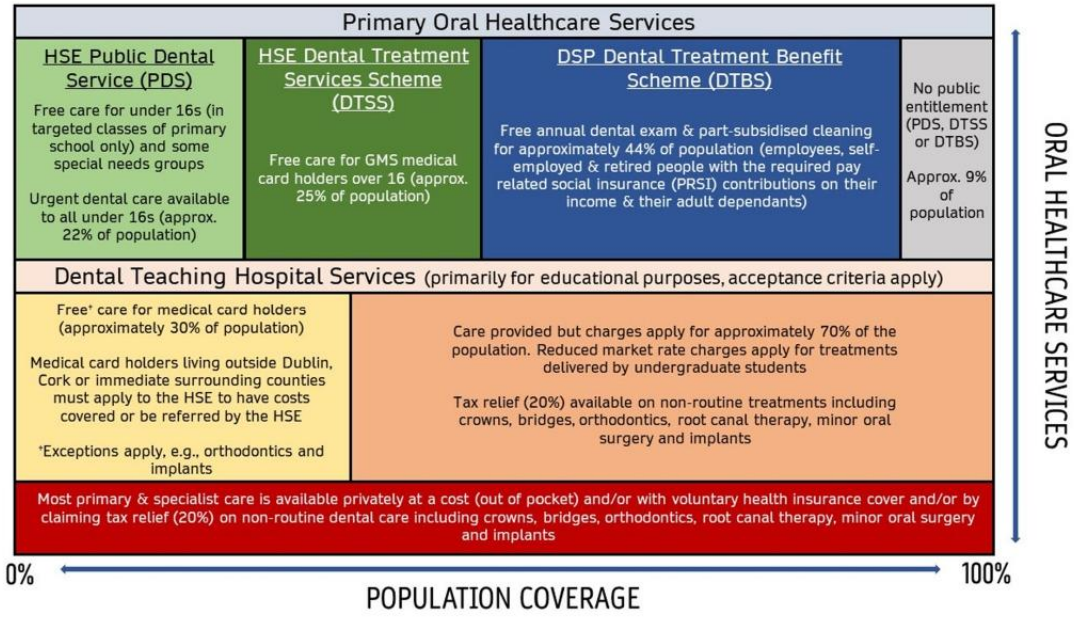

Fig. 3 Oral healthcare services and theoretical coverage (eligibility) for care in Ireland, 2023 (Adapted from [48]). HSE: Health Service Executive, GMS: General Medical Services, DSP: Department of Social Protection

[23]. Medical cards entitle holders to free public healthcare services and eligibility is based on a means-tested income assessment or having certain medical conditions or social vulnerabilities [51].

The DTSS is administered by the HSE PCRS which manages claims and payment of fees to GDPs [52]. Treatments are classified as routine ('above the line') or complex ('below the line') [47]. 'Above the line' treatments do not require prior approval and include an oral examination, cleaning, two fillings, any extractions and some emergency treatments per calendar year. Additional ('below the line') treatments (for example, root canal treatments or dentures) require prior approval by local HSE PDS managers. Small numbers of patients considered 'high-risk', for example those with haemophilia, may be eligible for a wider range of treatments [47]. The DTBS covers a wider population, namely insured workers, however it offers an annual dental examination and cleaning only, with additional treatments being paid for 'out of pocket' privately [43]. In contrast to the DTSS, the DTBS is administered by the DSP. Both schemes remunerate GDPs on a 'fee per item' basis [25]. Prior to 2010 and the imposition of budgetary cuts following the financial crisis of 2008, a wider range of treatments were available on both schemes [12].

The current system of state funded services delivery by private GDPs emerged in phases commencing with the Social Welfare Act in 1952 which established the Treatment Benefit Scheme (TBS) which includes the DTBS [53]. Since its inception, the DTBS has remained administratively distinct from other state-financed health services [54]. Individuals on low incomes in Ireland have been entitled to free dental care since the 1953 Health Act [55]. From 1970 to 2005, regional Health Boards were responsible for delivering services [56]. Since 2005, the HSE is responsible for contracting and or delivering public care. Between 1953 and 1994, care for medical card holders was delivered by salaried dentists employed by former Health Boards and through ad hoc initiatives utilising private GDP contractors [54]. Recognising the contribution made by GDPs, a working group established by the Minister for Health in 1988 recommended that adult medical card holders be treated in the private sector, freeing up capacity of salaried dental services for child dental care [57]. The DTSS was established in 1994 following the publication of the *Dental Health Action Plan (DHAP)* which was part of a wider healthcare strategy known as *Shaping a Healthier Future* [58]. Its aim was to improve the oral health of adult medical card holders and reduce inequalities by providing routine treatment, emergency care, and dentures to the elderly population [59]. Medical card holders were highlighted as having high levels of unmet dental needs in the National Survey of Adults' Dental Health (1989/90) [60]. Medical card holders were gradually transferred from salaried services to private GDPs, commencing with the over 65 s who had access to routine care including dentures. All other eligible population groups had access to emergency care. The scheme granted full access to routine care for 16–34 year olds in 1996 and 34–65 year olds in 2000 [12].

GDP-contractor workforce in Ireland: available indicators

Publicly available data allow us to begin building a picture of the prospective and actual GDP workforce in Ireland as it relates to the provision of state funded care. We mapped GDP workforce indicators in Ireland to 'availability', 'accessibility', 'acceptability', and 'service utilisation' critical dimensions of human resources for health as outlined in the HRH UHC cube. Indicator descriptions and 'AAAQ' framework dimension definitions are provided in Table 2.

'Availability' of dentists in Ireland

Dentists in Ireland – general workforce data

In August 2023, there were 3,605 dentists licensed to practice in Ireland [62]. This figure reflects those practising in Ireland as well as those living and working overseas who maintain registration with the Dental Council of Ireland. This equates to just under 7 dentists per 10,000 population, 0.7 dentists per 1,000 population or 1,500 people per dentist [65]. According to the OECD, the estimated number of practising dentists in Ireland in 2022 was 2,420 [65]. This equates to just under 5 dentists per 10,000 population or 2,100 population per dentist [58]. In 2022, 90 dentists graduated from Ireland's existing two dental schools [66]. This equates to just under 2 graduating dentists per 100,000 population. In 2021, the European Union figure was 3.1 per 100,000 [85].

DTSS GDP contracts, service utilisation and expenditure 2008–2023

The number of DTSS contracts held by private GDPs and those participating clinically in the scheme have steadily declined in the 15 years since 2008 (Fig. 4).

On December 31st 2008, at the outset of the global financial crisis, there were 1,161 DTSS agreements between the HSE and private GDPs [67]. As the global financial crisis took hold the number of DTSS treatments carried out peaked at over 1.5 million in 2009 [68]. The number of unique patients who received care on the scheme was 343,067 with government expenditure of just under €87 m [68]. In response to cuts in government expenditure announced in Budget 2010, funding was capped at 2008 levels and restrictions placed on number of treatments permissible [86]. The volume of treatments claimed subsequently dropped by 26% from 1.4 million in 2010 to 1 million in 2011 [70]. Despite the cuts, the number of contracts increased by 18% from 1,392 in 2010

Table 2 GDP workforce indicators in Ireland (state-funded contracted primary dental care)

'AAAQ' effective health coverage dimension	Dimension Definitions [61]	Indicator	Data available for year(s)	Indicator source, citation
Availability	The sufficient supply, appropriate stock of health workers, with the relevant competencies and skill mix that corresponds to the health needs of the population	Number of dentists licensed to practice, head count. Includes practising and non-practising dentists	2023	Dental Council of Ireland [62]
		Number of dentists licensed to practice, per 10,000 population. (WHO recommended core indicator 1: Number of health workers per 10,000 population [63])	2021	WHO European Health Information Gateway [64]
		Number of practising dentists, head count (estimate).	2022	OECD [65]
		Number of dentists graduating from dental schools in Ireland (per 100,000 population). (WHO recommended core indicator 3: Annual number of graduates of health professional educational institutions per 100,000 population – by level and field of education) [63]	2022	OECD [66]
		Number of private GDP Dental Treatment Services Scheme (DTSS) contracts (WHO associated indicator: rate of retention of health service providers at primary healthcare facilities in the past 12 months) [63]	2008–2023	HSE PCRS [42, 52, 67–80]
		Number of private GDPs who submitted claims for reimbursement under the DTSS	2008–2022	HSE PCRS [67–75] Personal communications (P Leavy and D Nicholson)
		Number of private GDP Dental Treatment Benefit Scheme (DTBS) contracts (WHO associated indicator: rate of retention of health service providers at primary healthcare facilities in the past 12 months) [56]	2008, 2016, 2023	DSP [81] Hasse and James (2016) [82] Guiney et al. (2013) [83]
Accessibility	The equitable distribution of health workers in terms of travel time and transport (spatial), opening hours and corresponding workforce attendance (temporal), the infrastructure's attributes (physical – such as disabled-friendly buildings), referral mechanisms (organizational) and the direct and indirect cost of services, both formal and informal (financial)	DTSS and DTBS GDP contractor practice address (street, town, county and/or postcode) (WHO core indicator 2: Distribution of health workers by occupation/specialization, region, place of work and sex) [63]	2023	HSE PCRS [84] DSP [81]
		Dental practice main entrance wheelchair accessibility	2023	Google Maps [36]
		Dental practice addresses urban-rural classification (by small area)	2016	CSO Urban and Rural Life in Ireland [35]
		Dental practice addresses deprivation index (by small area)	2016	Pobal HP Deprivation Index for Small Areas (SA) [34]
Acceptability	The characteristics and ability of the workforce to treat all patients with dignity, create trust and enable or promote demand for services; this may take different forms such as a same-sex provider or a provider who understands and speaks one's language and whose behaviour is respectful according to age, religion, social and cultural values etc.	DTSS and DTBS GDP-contractor place of primary dental qualification (university, city, country) (WHO associated indicator: proportion of nationally trained health workers (e.g., with distribution of foreign trained workers by country of origin) [56]	2023	Dental Council of Ireland [62]
		DTSS and DTBS GDP-contractor number of years qualified as dentist	2023	Dental Council of Ireland [62]
		DTSS and DTBS GDP-contractor sex	2023	*HSE PCRS [84] *DSP [81] *Derived from
Service utilisation	No definition provided for in AAAQ framework. WHO definition: the quantity of health care services used	Number of patients eligible for care under the DTSS (adults < 16 holding a medical card)	2008–2023	HSE PCRS [42, 52, 67–80]
		Number of unique patients treated under the DTSS		
		Number of treatments carried out under the DTSS		

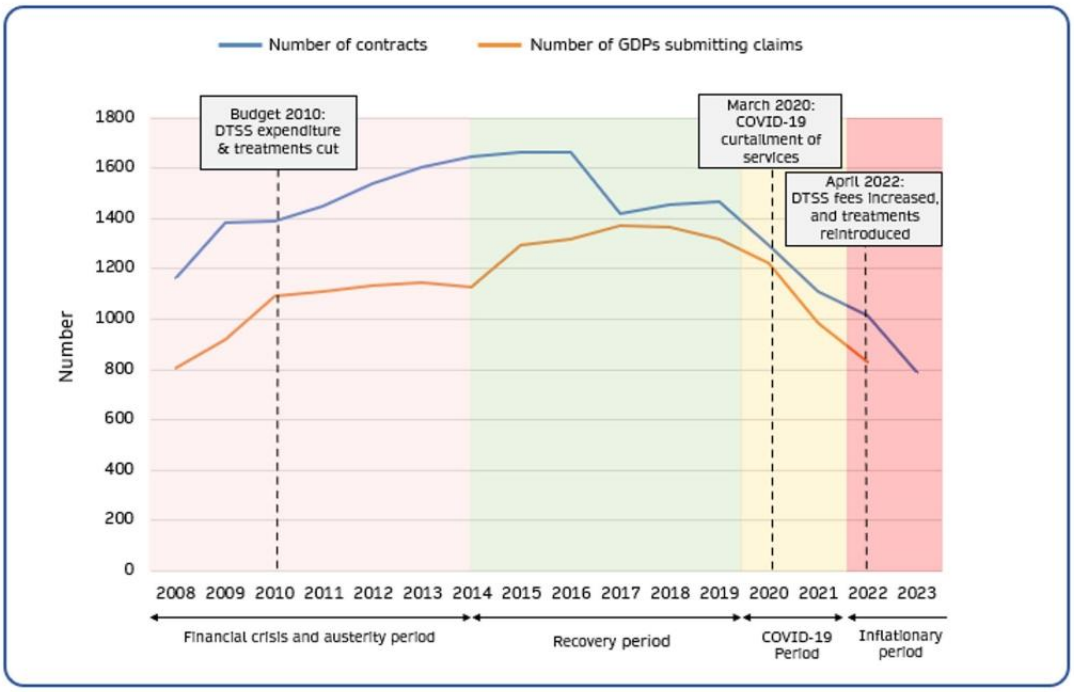

Fig. 4 GDP DTSS contracts and GDPs submitting claims 2008–2023

to 1,643 in 2014, marking an overall increase of 40% in the number of agreements during the 'austerity' period (Fig. 4) [73]. Similarly, the volume of treatments and patients treated steadily increased, plateauing in 2014 at just over 1.3 million treatments and 430,000 patients. At 1,664, the number of contracts peaked in 2016, thereafter declining throughout Ireland's economic recovery period alongside the number of eligible patients.

COVID-19 was declared a pandemic in March 2020 and dentistry was restricted to urgent care only (until May 2020) when enhanced infection control measures were implemented [87–89]. Reduced clinical capacity throughout 2020 coincided with a 25% drop in DTSS activity (Fig. 5). By the end of 2020, the number of contracts had declined to 1,292 and by the end of 2021 the figure stood at 1,111. In April 2022, the Minister for Health announced an increase in DTSS fees of between 21% and 50% and the re-introduction of 'scale and polish' for all patients [90]. This was the first time fees were increased since 2010. The volume of claims for that service item alone increased by 1305% from 7,125 in 2021 to 100,113 in 2022. Despite these changes, there was a further decline in number of GDP contracts. In August 2023, 16 months after the Russian invasion of Ukraine and the start of the inflationary period, there were 787 agreements remaining between the HSE and private GDPs, representing a 22% reduction on 2022 levels. Throughout the COVID-19 and inflationary period, the gap between those eligible for and those receiving care on the DTSS widened (Fig. 5).

Analysis of the number of dentists with DTSS contracts by payment range published in PCRS annual reports and supplementary data made available by the HSE (personal communications, P Leavy and D Nicholson) revealed the difference in number of dentists holding contracts compared to those receiving payment, and are therefore considered 'clinically active' in the scheme (Fig. 4) [67–76]. Between 2008 and 2016, the difference in the number of GDPs holding contracts and those receiving payment for activity ranged from 20 to 33% (Fig. 4). However, from 2017 onwards this gap narrowed, and in 2022 there was a difference of 18% between the number of contract holders and claimants. In 2022, the HSE remunerated GDPs to the sum of €49.5 million with respect to just under 257,000 unique DTSS patients [80]. This equates to an average annual costing of €190 per unique patient.

DTBS GDP contracts 2008–2023

Figures on the number of DTBS agreements by year are not made publicly available by the DSP. A 2013 study by Guiney et al. examining longitudinal trends in DTBS activity found the number of GDPs submitting claims in

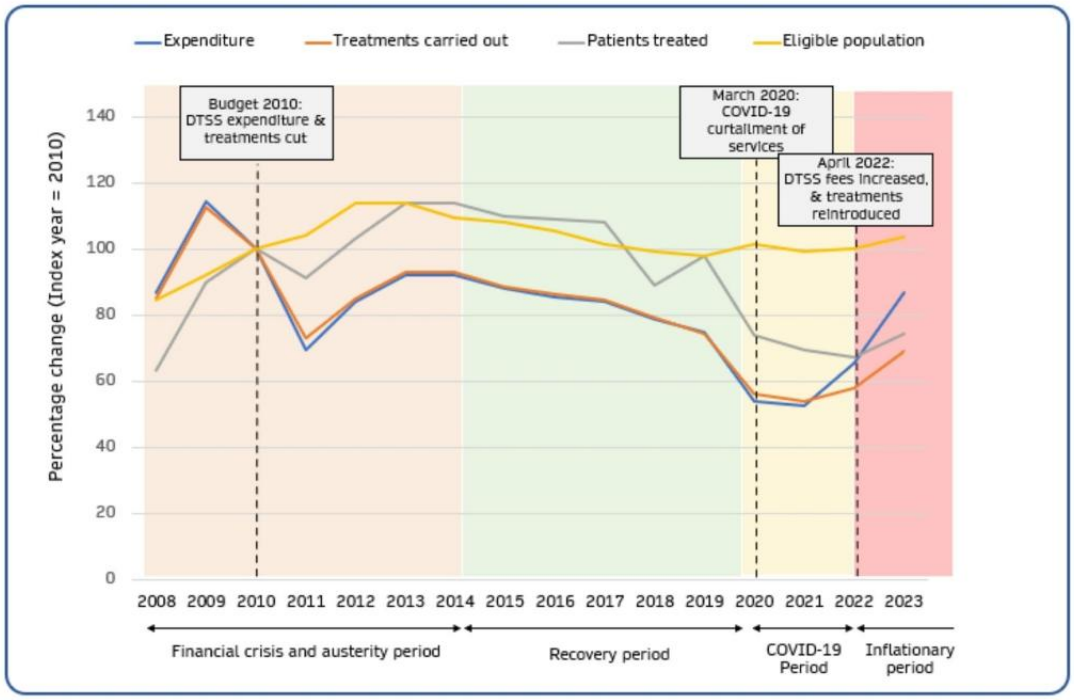

Fig. 5 DTSS utilisation and expenditure, percentage change 2008–2023

2008 was 1,525 [83]. Only one other data source relating to DTBS contractors during the last 15 years was readily identified, Hasse and James' spatial analysis which found there were 1,959 DTBS contracts, relating to 1,488 unique GDPs across Ireland in 2016 [82]. As of August 2023, there were 2,384 DTBS agreements across Ireland [81]. In the 12 months up to December 2023, the DSP reportedly made payments to 1,878 contractors [91].

'Accessibility'

We retrieved at total of 976 individual contract records for DTSS or DTBS providers in our two health regions. Of these, 48 were excluded from our analysis for the following reasons: GDP could not be identified from the Dental Council register ($n = 42$), no practice details provided, or practice closed ($n = 4$), duplicate of same contract type for GDP at practice ($n = 2$) Our final sample consisted of 928 contract records with respect to 655 unique GDPs working across 288 dental practices (172 in D&M and 116 in W&NW).

GDP contracts distribution

We investigated the distribution of GDP contracts by state scheme according to the AAAQ framework across the D&M and W&NW regions. As of August 2023, there were a total of 125 DTSS agreements with respect to 119 unique dentists in D&M. This equates to 16% of the national total of DTSS contracts. Across the W&NW, there were 131 DTSS agreements with respect to 124 unique GDPs, representing 17% of the national total of DTSS contracts. Conversely, the number of DTBS agreements in D&M stood at 459 with respect to 412 unique GDPs, equating to 19% of the national total while in the W&NW, there were 261 active DTBS contracts among 237 unique GDPs or 11% of the national total. Owing to its size and predominance, most public contracts in D&M were active in Dublin Southwest city and county (Fig. 6). In midland counties outside Dublin, most contracts were active in independent urban towns with populations between 1,500 and 49,000 where less than 20% of the population work in cities [28]. In contrast to D&M, 20% of DTSS contracts and 14% of DTBS contracts in the W&NW were spread across rural areas, reflecting the region's geography.

Most contracts were allocated to GDPs working in areas marginally above or below the average deprivation level however differences were noted in the proportion of contracts active in affluent and disadvantaged areas (Fig. 6). While just 7% of all DTBS contracts in D&M were active in 'disadvantaged' or 'very disadvantaged'

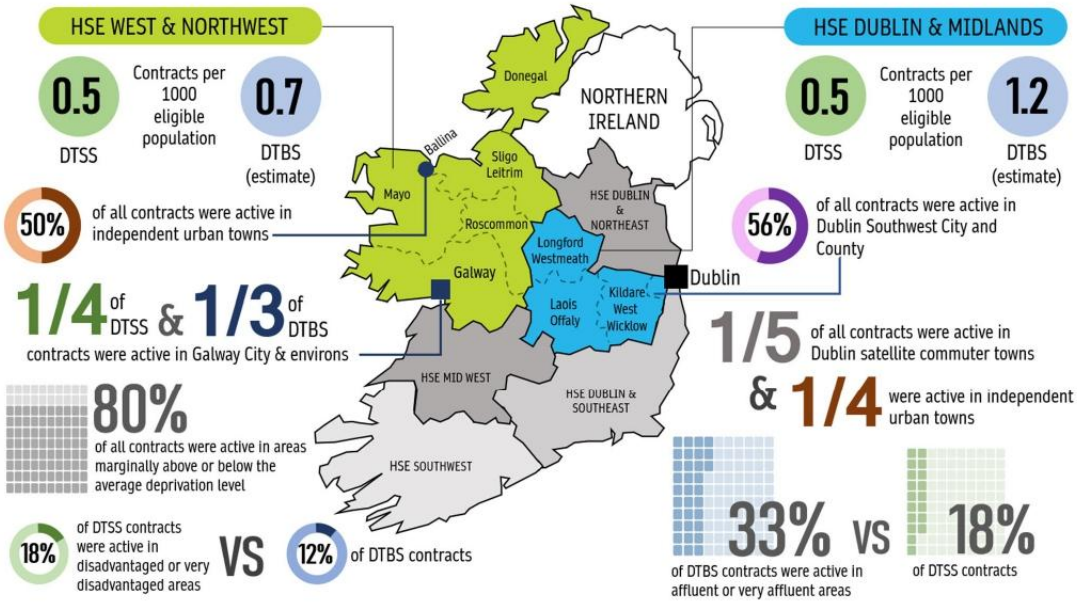

Fig. 6 DTSS and DTBS distribution of contracts; summary statistics (August 2023)

areas, the figure for DTSS contracts was more than double this at 15%. Conversely, almost twice the number of DTBS agreements in D&M were active in 'affluent' or 'very affluent' areas compared to DTSS contracts. A higher proportion of DTBS contracts in the W&NW region were assigned to GDPs working in 'disadvantaged' or 'very disadvantaged' areas compared to D&M, while the figure for DTSS contracts was like D&M at 18%. This difference between the regions can also be seen in the proportion of contracts active in 'affluent' or 'very affluent' areas with just 6% of DTBS and 2% of DTSS contracts in the W&NW assigned to practices in these areas, reflecting the region's geography and economy.

Practice wheelchair accessibility

Using the search filter on Google Maps, we investigated practices' reported main entrance accessibility for wheelchair users [36]. Of the 288 practices identified in our sample, 181 (63%) were accessible of which 89 (49%) had at least one DTSS-contracted GDP listed as working there. More practices in the West & Northwest (n = 81, 69%) were listed as wheelchair accessible compared to Dublin and Midlands (n = 100, 58%).

'Acceptability'

GDP-contractor characteristics

We compared the characteristics of contractors by available demographics to ascertain population 'acceptability' according to the 'AAAQ' framework, namely experience and diversity. Triangulation of the three publicly available databases, allowed for comparison of GDPs by contracts held utilising the following indicators: sex, number of years qualified and place of qualification (Table 3). As of August 2023, there were 655 unique GDPs holding DTBS and or DTSS contracts across the two health regions.

Most GDPs holding only DTBS contracts were female (53%) while the majority of DTSS contract holders were male, of whom most held DTBS contracts also (Table 3). A small number of GDPs were listed as holding only DTSS contracts. DTSS providers were, on average, qualified longer than DTBS-only providers across the two regions with 60% of GDPs holding both DTSS and DTBS contracts being qualified 20 years or more compared to 32% of DTBS-only contractors. Comparison of contractors by place of primary dental qualification revealed only minor differences between GDPs by contracts held (Table 3).

Discussion

This study investigates the availability of GDP workforce indicators relevant to state-funded contracted primary oral healthcare in Ireland and compares contractors by scheme across two distinct geographical regions, one of which is highlighted in the NOHP as lacking in sufficient workforce and where access to routine care is limited. The study provides an overview of primary oral healthcare services in Ireland highlighting the important role played by private GDPs in the delivery of state

Table 3 Comparison of GDPs by contracts held (2023)

Variable	DTBS-only (*n* = 426)	DTSS + DTBS (*n* = 212)	DTSS-only (*n* = 17)	DTBS-only (*n* = 297)	DTSS + DTBS (*n* = 104)	DTSS-only (*n* = 7)	DTBS-only (*n* = 129)	DTSS + DTBS (*n* = 108)	DTSS-only (*n* = 10)
	Combined regions			Dublin & Midlands			West and Northwest		
Sex (female) n (%)	228 (53%)	87(41%)	5 (29%)	161 (54%)	41 (39%)	2 (2%)	67 (52%)	46 (43%)	3 3 (30%)
Number of years qualified, n (%)									
0–5	78 (18%)	18 (8%)	3 (17%)	56 (19%)	10 (10%)	2 (29%))	22 (17%)	8 (7%)	1 (10%)
6–10	87 (20%)	27 (13%)	2 (12%)	64 (22%)	13 (12%)	1 (14%)	23 (18%)	14 (13%)	1 (10%)
11–20	126 (30%)	41 (19%)	3 (17%)	96 (32%)	21 (20%)	1 (14%)	30 (23%)	20 (18%)	2 (20%)
> 20	135 (32%)	126 (60%)	9 (53%)	81 (27%)	60 (58%)	3 (43%)	54 (42%)	66 (61%)	6 (60%)
Place of qualification, n (%)									
Ireland	288 (68%)	137 (65%)	15 (88%)	203 (68%)	70 (67%)	6 (86%)	85 (66%)	67 (62%)	9 (90%)
UK	49 (12%)	38 (18%)	1 (6%)	30 (10%)	9 (9%)	0	19 (15%)	29 (27%)	1 (10%)
EU	65 (15%)	22 (10%)	0	50 (17%)	13 (12.5%)	0	15 (12%)	9 (8%)	0
Non-EU/UK	24 (5%)	15 (7%)	1 (6%)	14 (5%)	12 (11.5%)	1 (14%)	10 (7%)	3 (3%)	0

funded care since the early 1950 s [54]. We identified and retrieved several indicators aligned to the WHO Dimensions of health workforce coverage ('AAAQ') framework.

General contractor workforce trends

The main findings of this study highlight the declining number of GDPs holding DTSS contracts and those clinically engaging with the scheme. This was accompanied by a fall in the number of patients treated despite an increase in the numbers eligible. Dentists in this scheme are more likely to be male, qualified longer and practising in disadvantaged areas outside cities compared to DTBS-only contractors. This finding is critical for Ireland given that the current oral health policy, *Smile agus Sláinte*, is reliant on much greater provision of publicly funded care by private GDPs [25].

Globally, health systems are experiencing similar challenges regarding workforce capacity and access to care. In 2021, the number of private GDPs providing NHS general dental services across England fell to its lowest level since 2014 from 24,684 in 2020 to 23,733 with a myriad of factors reportedly accounting for recruitment and retention difficulties there [92]. A frequently cited factor being the NHS contract which operates a target-based, 'bundled care' model and accounts for high levels of stress and burnout among GDPs as they attempt to fulfil contract requirements [26, 93]. It has also been suggested that a burgeoning private market in cosmetic dentistry and facial aesthetics, driven in part by social media promotion is facilitating dentists to choose to work in that sector [94, 95]. This coupled with changing career aspirations among younger dentists, who favour flexible, part time working and variety, might further be displacing capacity for state-funded care which has been portrayed negatively [92, 96]. Similarly, in Scotland, where a fee per item contract operates, the number of GDPs providing NHS care has dropped by 12% since the onset of the COVID-19 pandemic when services were severely curtailed [97]. This study shows that Ireland has experienced a proportionally steeper decline in the number of DTSS contract holders and those engaged clinically with the scheme, while the numbers holding DTBS contracts appear to have increased. Unlike the UK, the oral healthcare market in Ireland is a largely private one and state funded services do not cover most of the population, nor do they offer comprehensive baskets of care [38]. Despite these differences, many of the same factors influencing UK GDPs' decisions to leave the NHS or reduce their commitment appear to be the same as in Ireland and elsewhere. In the United States (US) private GDPs can opt into public insurance 'safety net' schemes for disadvantaged groups, for example, Medicaid [98]. These remunerate dentists on a fee per item basis and, like the DTSS, have also experienced difficulties with GDP participation, namely low enrolment in or low willingness to provide care to patients on schemes [99]. Low reimbursement rates, burdensome administration and negative perceptions of service users have consistently been reported as reasons for non-participation among American GDPs [100].

By mapping workforce trends to key points in time during the period 2008–2022, we can also see the impact of broader contextual factors and market forces on GDP-contractor trends in Ireland, one notable example being the 2008 global recession. Despite cuts to schemes in 2010, the number of GDPs signing DTSS agreements and submitting claims increased. During this period, Ireland saw increased unemployment and less disposable income among the general population [101]. This had the effect of increasing the number of medical card holders and reducing 'out of pocket' spending on healthcare [102]. Studies suggest that during periods of economic difficulty, private expenditure on oral healthcare declines, especially among low-income populations, along with GDPs' income [103, 104]. It is possible therefore, that despite cuts to treatments available, the DTSS offered

Irish GDPs some level of demand-led stability and regular income, as has been theorised by others elsewhere [105, 106]. As Ireland exited its EU/International Monetary Fund (IMF) financial 'bailout' in 2013 and entered a period of economic growth, DTSS activity began to fall.

GDP contractor distribution and characteristics

Findings of this study with respect to the distribution and characteristics of GDP contractors mirror those of some US-based studies of safety net providers. Using provider and claims databases, Nasseh et al. estimated that 48% of GDPs with 100 or more Medicaid patients practised in very disadvantaged areas compared to 18% of GDPs with no Medicaid patients [13]. They also found that GDPs providing Medicaid care were more likely to practice in rural areas. In contrast to the current study however, a 2021 spatial analysis of NHS dentists across England revealed widespread geographical disparities between urban and rural areas [107]. Jo et al. found that almost all of England's urban population live in close proximity to an NHS dental practice compared to 50% of the rural population. In this study, we noted the same ratio of DTSS providers per 1000 eligible population across both regions, contrasting with England's experience. A 2018 study by Maxley et al. found that early career GDPs (aged 35 or under) in the US state of Indiana were less likely to be clinically engaged in Medicaid compared to older GDPs aged 55 and above, reflecting similar findings of this study [99]. Maxley et al. also noted that among 1,033 Medicaid-enrolled GDPs approximately 25% were clinically inactive, submitting no claims on the scheme, again mirroring our findings with respect to DTSS engagement.

Data and monitoring

As part of *Smile agus Sláinte's* development, several workforce-related reports were commissioned including Hasse and James' spatial analysis and a separate appraisal of available data for workforce planning [82, 108]. Both reports and *Smile agus Sláinte* recognise the paucity of meaningful and contemporaneous workforce data and highlight the need for more robust data collection. This study builds on these reports by mapping available workforce indicators in Ireland using a WHO framework. While the data collected allow us to start painting a picture of the GDP workforce, many gaps remain in our workforce intelligence. In the context of recruitment and retention challenges not just in state funded care, but more widely within Irish dentistry, and the implementation of *Smile agus Sláinte*, there remains however, a need for much greater data collection and monitoring of current activity as well as updated epidemiological data on levels of need in the general population. Capturing a greater range of indicators, for example, on workforce diversity and ethnicity, clinicians' hours of work, practice profiles and skill mix utilisation, as well as patient outcomes, may facilitate a greater understanding of the quality of services currently being delivered and progression and monitoring of policy implementation.

Policy implications

The current workforce shortages have left adult medical card holders with very limited access to routine or urgent dental care. This also leads to them having to incur greater financial hardship as they fund care out-of-pocket [21]. Meanwhile, the Department of Health is seeking to reform by contracting more care to private GDPs. *Smile agus Sláinte* proposes shifting care for children and vulnerable adults away from the HSE PDS and into private general dental practices, alongside existing DTSS and DTBS patients [25]. The findings of this study have direct implications for policy implementation. Based on our findings, existing DTSS contractors are qualified longer, are therefore more likely to be practising longer and potentially nearing the end of their practising careers. As highlighted already, while fewer early career dentists hold DTSS contracts, they are more likely to hold DTBS contracts, demonstrating a willingness to engage in state-funded care. Recognising the need to increase dentist workforce capacity, in 2023 the Irish Government announced its intention to increase in the number of Irish and EU undergraduate dental student places across Ireland's dental schools [109]. Notably, this includes a new dental undergraduate programme, currently in development, which will see students receive training entirely in primary care settings, rather than a traditional dental teaching hospital [110]. The rationale behind this approach is to fully prepare new graduates for a career in primary care dentistry, including working with disadvantaged populations [110]. Against this backdrop, leveraging health system change (including the design of dental contracts) to maximise participation of early career dentists in state dental schemes will be crucial. While the DTBS is a 'smaller' scheme in terms of the basket of care offered and the amount GDPs are paid per course of treatment is capped at €75 (plus a patient co-payment of €15), GDPs arguably have greater clinical autonomy and freedom to offer additional treatments privately. *Smile agus Sláinte* proposes changing the way GDPs are remunerated, from fee-per-item of service to 'bundled care' or blended payments [25]. International evidence suggests that GDPs can respond negatively to new models of care and provider payment methods as demonstrated by the abrupt abolition of a fee-per-item NHS contract in England and Wales, and its replacement with a bundled care contract in 2006 [111, 112]. While we do not have accurate data on the cost of an average course of care under the current DTSS, a 2019 report by the Economic and Social Research Institute (ESRI) of Ireland estimates that

the fee payable for an adult medical card holder package could range from €47.50 to €109.30 and from €33 to €367.83 for children [37]. These estimates are disaggregated by patient age bands and residential water fluoridation status and are based on 2019 DTSS fees. The extent to which GDPs will be permitted to offer additional or alternative treatments privately is unknown.

Limitations

While the use of secondary data allows us to gain useful insights into overall workforce trends, there are limitations to this methodological approach. Firstly, lists of DTSS and DTBS providers utilised in our analysis do not provide information on GDPs' level of clinical engagement with those schemes, if any. As highlighted in the results, up to 30% of DTSS contract holders may be clinically inactive on that scheme at any one time. Unlike in other jurisdictions, GDPs in Ireland are not required to deliver a minimum level of care or meet annual clinical targets and they receive no capitation or continuing care payments [47]. Moreover, GDPs must hold individual contracts for each practice they work in and therefore may hold multiple contracts within and across different regions. This has the potential to over-estimate the number of contractors and therefore caution is advised when interpreting these findings. Furthermore, there were no datasets available containing information on wholly private GDPs. This meant we could not compare GDP contractors and non-contractors. Additionally, we had no objective data from patients to inform the 'acceptability' indicator.

Our analysis of contract distribution focusses on two health regions only. These regions capture a range of counties and include remote, rural and coastal areas with varying degrees of deprivation, which are highlighted in the NOHP as being underserved, and where initiatives to encourage the redistribution of oral healthcare professionals will be required. Indeed, the recently published WHO global strategy and action plan on oral health asks member states to *"explore how to optimize private oral health care providers' engagement in [contracting and/or reimbursement] schemes"* [15]. While our findings expand on and provide a more detailed analysis of the GDP workforce in these regions, similar research on the other regions and nationally is required to assess if findings are generalisable across the entire state. Finally, our secondary data analysis solely focusses on dentists holding state contracts and therefore does not provide for a detailed analysis of other dental healthcare professionals, for example, dental hygienists. While the importance of optimal skill mix utilisation within dental teams and the potential for direct access to dental hygienists in improving access to preventative care are highlighted within the NOHP and echoed in the WHO global strategy and action plan on oral health (2024) [15], data relating to these groups are not available in Ireland (except for clinical dental technicians). Dental hygienists are not eligible to hold state-funded contracts therefore data relating to their participation in these schemes, if any, is not readily available. This precluded a detailed subset analysis of this group.

Recommendations for future research and practice

This health systems analysis highlights the requirement for improved and contemporaneous oral health workforce data collection in Ireland. There remains no accurate head count of practising dentists or indication of their clinical commitment or hours of work. The register of dentists held by the Dental Council is the single authoritative workforce database however it does not differentiate between dentists living and working in Ireland and those who are not, nor does it differentiate between practising and non-practising dentists, for example, academics. As dentists are required to register with the Dental Council on an annual basis, this presents an opportunity to capture key demographic and professional data which might be utilised to inform improved workforce intelligence and subsequent planning [113]. Another mandatory requirement to practise is possession of professional indemnity insurance, which is normally based on sector of work (e.g., general dental practice) and hours of work per week [113]. For researchers and policymakers, collaboration with indemnity organisations on these data might present another opportunity to gain access to key information on dentists' work patterns. Only with such data combined with data on all other oral health professionals, including a better understanding of the composition, characteristics and behaviours of primary care dental teams, can the reform committed to by government be delivered. A cross-sectional survey capturing practice-level data, for example productivity (including case mix and public/private split), skill mix utilisation and role delegation might help bridge a workforce intelligence gap. This is an urgent first step on the pathway to reform.

Conclusions

Engagement of private GDPs in state funded dental schemes is central to service reform and successful policy implementation, alongside improved workforce data collection and intelligence. The proposed *Smile agus Sláinte* reorientation of services will place a greater onus on private GDPs to care for vulnerable populations at a time when there is growing professional dissatisfaction with existing schemes [114]. There is a need not just to retain current private GDPs providing publicly funded care, but to attract new practitioners into schemes and retain them also. There is significant potential for a lack of GDP

supply and stock into the public system as the Irish Government seeks to implement changes and meet its WHO obligations on UHC for oral health and global commitment on ethical workforce recruitment.

Abbreviations

(D)TBS	(Dental) Treatment Benefit Scheme
AAAQ	Availability, Accessibility, Acceptability, Service Utilisation and Quality
CSO	Central Statistics Office
D&M	Dublin and Midlands
DHAP	Dental Health Action Plan
DSP	Department of Social Protection
DTSS	Dental Treatment Services Scheme
ESRI	Economic and Social Research Institute
EU	European Union
GDP	General Dental Practitioner
GMS	General Medical Services
HRH	Human resources for health
HSE	Health Service Executive
IMF	International Monetary Fund
NHS	National Health Service
NOHP	National Oral Health Policy
OECD	Organization for Economic Cooperation and Development
PCRS	Primary Care Reimbursement Service
PDS	Public Dental Service
PRSI	Pay related social insurance
QoL	Quality of life
SDA	Secondary Data Analysis
UHC	Universal Health Coverage
UK	United Kingdom
UN	United Nations
US	United States
W&NW	West and Northwest
WHO	World Health Organization
WTE	Whole time equivalent

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Authors' contributions
P.L. made substantial contributions to the study's conception, design, analysis, and manuscript drafting. Sara Burke made substantial contributions to study concept, design, analysis and manuscript revisions. B.D. made substantial contributions to study design, context development and manuscript revisions. Sarah Barry and P.F. made contributions to study concept development. All authors reviewed the manuscript.

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Data availability
Data that support the findings of this study are publicly available in the following repositories:
https://www.sspcrs.ie/libr/html/pcrs_dent_contracts.xml.
https://www.gov.ie/en/collection/d0e16a-treatment-benefit-scheme-list-of-dentists/.
https://www.dentalcouncil.ie/dentists.

Declarations

Ethics approval and consent to participate
Not applicable.

Competing interests
The authors declare no competing interests.

Author details
[1]Centre for Health Policy and Management, Trinity College Dublin, Dublin 2, Ireland
[2]Trilateral Research Limited, Waterford, Ireland
[3]School of Dental Science, Trinity College, Dublin 2, Ireland
[4]School of Population Health, Royal College of Surgeons in Ireland, Dublin 2, Ireland

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How and why do health system factors influence general dentists' participation in publicly funded, contracted primary dental care services: A realist review☆

Paul Leavy [a,*], Sophie Mulcahy Symmons [b], David Mockler [c], Pádraic Fleming [d], Blánaid Daly [e], John Ford [f], Sara Burke [a]

[a] Centre for Health Policy and Management, Trinity College Dublin, Dublin, Ireland
[b] UCD Centre for Interdisciplinary Research Education and Innovation in Health Systems (UCD IRIS Centre), School of Nursing Midwifery and Health Systems, University College Dublin, Dublin, Ireland
[c] John Stearne Medical Library, Trinity College Dublin, St James's Hospital, Dublin, Ireland
[d] Trilateral Research - Ethical AI, Waterford, Ireland
[e] School of Dental Science, Trinity College Dublin, Dublin, Ireland
[f] Wolfson Institute of Population Health, Queen Mary University of London, London, UK

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ABSTRACT

Objectives: To identify health system contexts and mechanisms influencing general dental practitioners' (GDPs) participation in state funded, contracted primary oral healthcare.
Methods: Peer-reviewed articles and other sources were identified via EMBASE, Medline (OVID), Web of Science and Google Scholar databases, grey literature search, citation tracking and expert recommendations. Studies meeting the inclusion criteria were assessed for rigour, relevance and richness, and coded to identify data relating to contexts, mechanisms and outcomes. Inductive and deductive coding was used to generate context–mechanism–outcome configurations (CMOCs) and develop the final programme theory.
Results: Database searching identified 1,844 articles of which 29 were included. A further 33 sources were identified through adjunctive searches. Analysis identified key systems contexts influencing GDP participation. These include system emphasis on treatment over prevention, low priority for oral healthcare, funding constraints, and change implementation with minimal clinician consensus. At operational level, contracts can restrict GDP decision-making and ability to deliver high quality and holistic patient care. Key underlying mechanisms were feelings of ceded clinical and entrepreneurial control, stress and demoralisation, mistrust of the system and feeling undervalued.
Conclusions: The factors influencing GDP participation in state-funded, contracted dental care over private dental care are complex. The findings presented in this review have the potential to act as a good place to start leveraging health system change including better GDP engagement and increase participation in publicly funded systems.

1. Background

Oral diseases including dental caries remain some of the world's most prevalent, and largely preventable non communicable diseases (NCDs), affecting up 3.5 billion people globally [1]. This disease burden is likely to increase as populations grow, and individuals retain their natural dentition into old age [2]. Recognising this global burden and the widespread variability in levels of oral healthcare coverage, United Nations (UN) member states agreed to adopt the World Health Organization (WHO) resolution on oral health at the 74th World Health Assembly (WHA) in 2021 [3]. This landmark agreement seeks to embed oral health within NCD and universal health coverage (UHC) agendas and acted as the springboard for the development of the Global Strategy and Action Plan on Oral Health 2023-2030 (2024) [4]. The overarching

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* Corresponding author at: Centre for Health Policy and Management, 3-4 Foster Place, Trinity College Dublin, Dublin, Ireland.
E-mail address: leavypa@tcd.ie (P. Leavy).

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vision of this strategy is the development of UHC for oral health by 2030 and in tandem with a preventative, public health approach to oral health, it advocates for the integration of oral health into mainstream primary care services.

As one of the six 'building blocks' of health systems, sufficient workforce capacity is recognised as key in ensuring availability and accessibility of services and patients have timely access to care [5]. As frontline healthcare professionals, primary care dentists remain the cornerstone of oral healthcare services with most care delivered in general (family) dental practices [6]. Worldwide, health systems have established models where state-financed or insured primary dental care is delivered by independent, mainly self-employed general dental practitioners (hereinafter, referred to as 'GDPs') working in independent ('private') dental practices under contract to state health authorities. Examples include National Health Service (NHS) General Dental Services (GDS) across the United Kingdom (UK) [7] and the Health Service Executive (HSE) Dental Treatment Services Scheme (DTSS) in Ireland [8]. Under these arrangements, GDPs agree to treat patients according to terms and conditions set by state health authorities and rates of remuneration are often fixed or capped.

There are long standing and well documented challenges regarding GDP participation in state funded, contracted dental services [9]. In Ireland, the number of GDP contractors participating in the DTSS, a scheme which serves low-income adults, has steadily declined, from 1664 in 2016[10], to just under 800 in 2023 [11]. In England, despite the number of NHS GDS contracts remaining largely unchanged since 2017, the volume of treatments delivered and patients receiving care has fallen as private GDPs reduce their NHS commitment [12]. Consequently, timely access to routine care for patients may be impeded, presenting a significant challenge to health policymakers and health service managers [12].

Workforce challenges in healthcare span all settings and specialties and are often described as complex [13,14] Solving these challenges rarely entails a single 'silver bullet' intervention but necessitates a deeper understanding of complex whole system factors and how these influence the behaviour of the system and aspects of it, including the workforce. In workforce planning, researchers and policymakers are increasingly adopting a 'systems thinking' approach which considers the various complexities, feedback and delays between decision making and change implementation [15,16]. From a policy perspective, the use of the private sector workforce may be viewed as an efficient means of creating clinical capacity within health systems [17], however models of contracting primary dental care rely on a steady supply of GDPs voluntarily opting into or remaining in such services. In contrast to directly operated state funded salaried dental services (frequently referred to as public or community dental services) [18], general dental practices operate as businesses where capital assets and staff are held and managed outside the state system, within the private sector [19].

While there is a considerable body of literature highlighting a range of factors influencing GDPs' participation in publicly funded services or programmes, these are often focussed on contract or programme-level features. In England, for example, the 2006 NHS GDS contract has proved unpopular with GDPs owing to unfavourable terms and conditions of service, namely the requirement to deliver annual clinical targets set by NHS commissioners in return for a fixed sum of remuneration [9,20]. In the United States, general dentists' participation in public insurance 'safety net' programmes for low-income populations, namely Medicaid and Children's Health Insurance Program (CHIP), has also proved challenging for policymakers and health service managers with low reimbursement rates frequently cited as the main barrier to participation [21–24].

Literature on how and why system-level contextual factors affect GDP engagement with state-funded dental care globally is limited. This knowledge gap is important in the context of UN member states meeting their international obligations on oral health and ensuring there is sufficient workforce capacity to meet population needs. Action point 62 of the WHO Oral Health Strategy and Action plan makes specific reference to *"including private oral health providers through appropriate contracting and/or reimbursement schemes"* and asks member states to *"explore how to optimize private oral health care providers' engagement in such schemes"* [4].

For this review, our primary focus is on understanding factors that influence GDPs' participation in state-funded care from a health systems level perspective. Given the requirement for a deeper understanding of this complex topic, a theory-driven realist review from the school of Pawson and Tilley was adopted [25]. This approach synthesises existing published and grey literature with the aim of identifying underlying, hidden causes for observed outcomes. In realist-focussed research, the inquiry is often framed as: 'what works (or happens), how, why, for whom and under what circumstances' [25]? Realist reviews are particularly useful for investigating or 'diagnosing' complex phenomena or problems [26]. They examine specific contexts ('C') in which certain hidden mechanisms ('M') are triggered (or modified) to result in given outcomes of interest ('O'). This is known as realist logic of analysis[27] (C + M=O) and the interplay or causal relationship between these, and the building blocks for realist reviews are referred to as 'Context – Mechanism - Outcome Configurations' ('CMOCs') [26]. These are then refined and utilised to create an overarching or final programme theory to explain or help understand the phenomena of interest.

This realist review sought to answer the following question: how, why, for whom and under what circumstances do health system factors influence general dental practitioners' participation in state (publicly) funded, contracted primary oral healthcare services?

2. Methods

This realist review was conducted with a predetermined, endpoint outcome of interest (GDP participation in state funded, contracted primary dental care) and with a focus on high-level health systems features. Adopting a realist review deepens our understanding of this complex topic by identifying health systems contexts and hidden causal mechanisms that are not easily measurable, and which may not have been fully explored in other studies. This review adhered to a study protocol based on Pawson's iterative stages[28] (Fig. 1) and followed the RAMESES realist review standards [29].

2.1. Project advisory group

A project advisory group (PAG) was established from the outset to consider emerging findings of the review. The PAG comprised the immediate research team, oral health services and policy researchers (n = 2), health systems researcher (n = 1), frontline clinicians (n = 3), civil servant (health workforce planning) (n = 1) and patient and public involvement (PPI) representatives (n = 2). Engagement took place via Microsoft Teams videoconferencing platform over two meetings in May 2023 and June 2024 where emerging findings and theories were presented to stakeholders and they had the opportunity to confirm, refine, or refute these, based on their knowledge and experience. The use of external stakeholder groups in realist reviews is an established and recommended practice [30].

2.2. Initial programme theory

To inform the literature search strategy, a rough initial programme theory (IPT) was developed by PL and subsequently discussed with PF (supplemental). IPTs are used as a starting point for realist reviews and constitute a prior understanding of how phenomena or outcomes occur. An IPT may be based on preliminary reading of the literature, or the expertise of stakeholders [26]. This was informed by informal reading of literature and the research team's existing knowledge of dental and wider health workforce and health systems. The IPT listed potentially important contexts (e.g., lack of financial incentives) and mechanisms

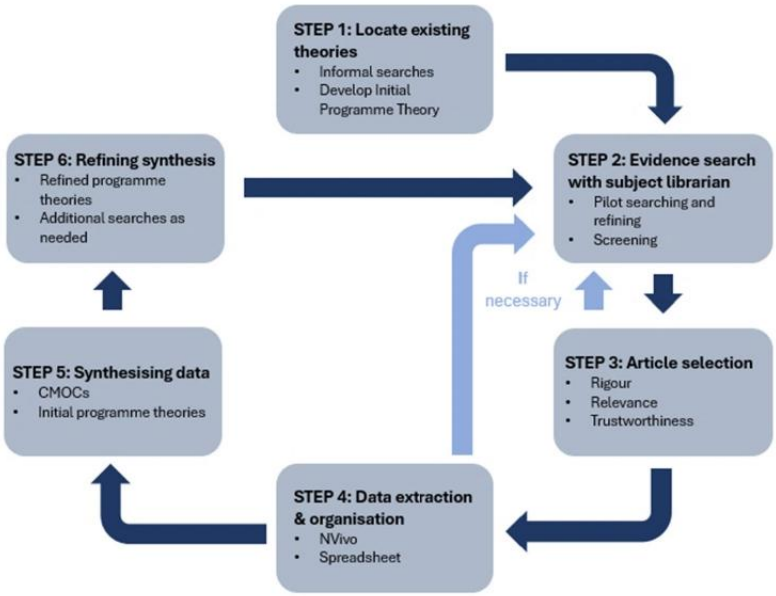

Fig. 1. Realist review stages.

(e.g., stress and burnout) impacting the outcome of private GDP participation in state funded, contracted dental care. Literature was identified through an exploratory desktop internet search using Google search engine and included published articles, government reports, news, opinion articles and blogs published by dental professional representative organisations.

Thereafter, a series of 'if, then, because' statements were constructed in realist terms to further elucidate potential contexts and mechanisms (supplemental). These, and the IPT were shared with stakeholders and utilised to stimulate discussion during the first PAG meeting.

2.3. Searching

With the assistance of a subject librarian (DM), a formal search strategy of peer-reviewed, published literature was developed (supplemental), and searches were undertaken across four online databases: EMBASE, Google Scholar, Medline (OVID) and Web of Science within the date range 1 January 2000 to 15 March 2023 when searches were conducted. There were no restrictions on study designs or sources eligible for inclusion in this review. Search results were imported to EndNote™ 20 reference management software and deduplicated automatically and manually.

Additional searches were later undertaken iteratively in the form of citation tracking of included studies and internet searching of relevant grey literature. These took place between May and July 2024. The primary purpose of adjunctive searches was to identify supplementary material relevant to both health systems contexts and mechanisms to build upon our emerging CMOCs.

2.4. Selection and appraisal of documents

Studies or sources were included based on relevance to the review question, that is, if they provided relevant information or data about GDP participation in state-funded, contracted primary dental care and would contribute to the development and refinement of programme theory. Only studies related to the OECD region and those written in English were included. All titles and abstracts were screened by PL using COVIDENCE online systematic review tool with SMS independently blind-screening a 10% random sample for consistency (and again during full text screening). An initial assessment of relevance, rigour, and data richness (for definitions, see glossary in supplement) was undertaken during the screening phase and as additional literature was collected.

2.5. Data extraction and analysis

Following the screening process, study characteristics were collated using a Microsoft Excel spreadsheet. Characteristics included publication year and country, study aim and design. Thereafter, relevant text excerpts from included articles were coded using NVivo 12 Plus qualitative data analysis software. Coding was carried out both inductively from data emerging from studies and deductively based on a series of concepts derived from the initial programme theory. Codes were subsequently grouped by concept, for example 'remuneration and funding', 'quality care' and 'control' and assigned labels of 'context', 'mechanism', or 'outcome'. As the analysis progressed, codes were refined and merged based on emerging findings. Coding categories and emerging concepts were reviewed by research team members, and senior supervising authors PF and JF.

Realist logic was then utilised to analyse data from included studies and construct CMOCs. The analysis commenced with our endpoint outcome of interest and tracked backwards along the C-M-O pathway. Patterns emerging with some regularity ('demiregularities' [29]) when mechanisms are triggered in certain contexts were identified.

The analysis was iterated over a period of 6–9 months where the causal relationships between contexts, mechanisms and outcomes were investigated. A total of 24 individual CMOCs (supplemental) were developed and subsequently grouped together into the six consolidated CMOCs described below. CMOCs were subsequently utilised to develop the final programme theory.

3. Results

3.1. Search results and study characteristics

In total, after deduplication, 1844 titles and abstracts were screened following which 208 peer-reviewed articles were deemed eligible for full text review (Fig. 2). During reading of full texts, a further assessment of relevance, rigour and data richness was undertaken, and 179 articles were deemed not to have met standards and were therefore excluded. Twenty-nine [29] peer-reviewed articles, mostly from the UK were included. Owing to the endpoint outcome being predetermined, searches were focussed on identifying mechanistic-rich data. Through content expert recommendations, forward and backward citation tracking and adjunctive literature searching using Google and various organisations' websites, an additional 33 sources including peer-reviewed articles and 'grey' literature were identified from the UK, Ireland, USA and elsewhere including the OECD and Europe regions. A breakdown of study and data source characteristics is provided in table 1.

Table 1
Summary of included studies and sources providing data for CMOCs (full list available in supplemental data).

Study/source characteristics	Number of studies/ sources
Country or region	
UK	41
Ireland	8
USA	3
USA and Canada	1
Europe (Region)	1
Global or non-specific	8
Study/source type	
Peer reviewed published journal articles	
Qualitative	21
Quantitative	4
Mixed methods	10
Review article	2
Other (e.g., descriptive paper)	5
Grey literature	
Academic report	6
Other report	4
Editorial/opinion article	3
Other (e.g., health service website)	7
Participants or focus	
Dentists only	22
Health service leaders/managers/decision makers only	3
Mixed populations	9
Health system or other	28
Year of publication	
2000–2005	3
2006–2011	19
2012–2017	9
2018–2024	31
Total	62

3.2. Context–mechanism–outcome configurations

The following CMOCs are the key findings from this realist review.

CMOC 1. Quality care and job satisfaction

The first CMOC (Fig. 3) examines the context where health systems are under pressure to contain costs and increase efficiencies due to fiscal constraints or austerity measures [12,31,32], and which focus on dental care models that are primarily treatment-intensive (rather than preventative) and focussed on delivery by dentists (rather than wider dental team members) [33–37]. Where state-funded services are provided by GDPs on behalf of state health authorities, restrictions are often built into contracts as a means of containing exchequer costs [12,33,38]. These may limit the quantity of treatments that GDPs can offer patients on public contracts [39,40] as well as directly or indirectly limiting the types of treatment they can offer, for example, by prohibiting the use of certain restorative materials or through fee constraints [19,39,41–43].

Operating within this context can trigger feelings of pessimism among GDPs because they perceive an inability to offer their patients care that they consider to be high quality, contemporary or comprehensive [42,44–51]. GDPs may be less likely to feel a sense of satisfaction (reward) or pride in their work [44,51] and experience increased professional dissonance [32] – discomfort arising from conflicting professional values and expected or required job tasks [45,46,52–54].

> *"… [Under the new contract] I find it difficult to take pride in my work any more."*[44]

Additionally, while working within public contracts may afford early career GDPs experience delivering a range of routine treatments, long term commitment may be perceived as disadvantageous for developing more complex clinical skills and for career progression [45,46,55,56].

These mechanisms can prompt GDPs to reduce their commitment on

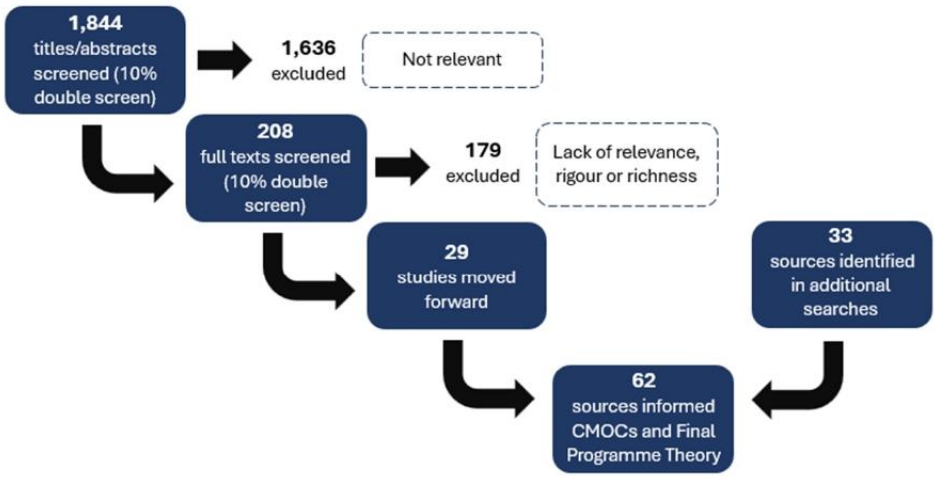

Fig. 2. PRISMA diagram.

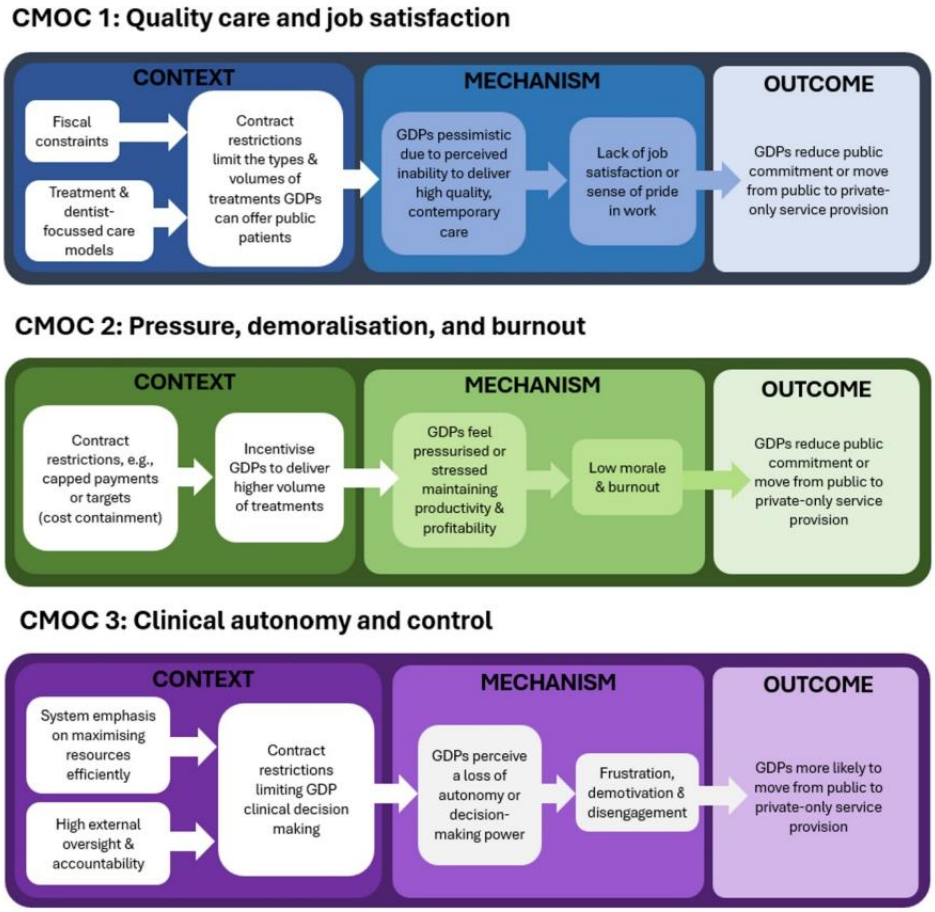

Fig. 3. CMOCs 1–3.

public schemes or seek employment elsewhere, for example, 'wholly private' practice where fewer restrictions may exist.

CMOC 2. Pressure, demoralisation, and burnout

The second CMOC (Fig. 3) explores contexts where cost containment measures embedded within contracts or programmes such as capped remuneration in return for delivering an agreed volume of bundled care or where fee for service reimbursement rates are low compared to private or 'out of pocket' (market) fees, incentivise or drive GDPs operating as independent contractors to deliver a high volume of treatments or treat a large volume of patients, often over a short time period [45,46,57,58].

> *"They reported feeling thwarted by the higher volume targets that they had to achieve within a limited timeframe in order to meet practice and personal financial commitments"* [46]

This can trigger feelings of stress as GDPs come under pressure to maintain productivity and profitability or achieve clinical targets set by health authorities [45,46,57–59]. Time pressures may also compound the mechanisms in CMOC 1, especially when GDPs' workloads are treatment-intensive ('drilling and filling') or do not facilitate provision of holistic patient care. These pressures can be compounded further where GDPs provide care for dental corporate bodies as sub-contractors [46,54,60]. Over time, this can result in demoralisation and burnout [46,61,62] which can lead GDPs to step away from providing care on public contracts.

CMOC 3. Clinical autonomy and control

CMOC 3 (Fig. 3) describes a context in which there is a strong health systems emphasis on delivering care cost-effectively ('doing more with less') and ensuring value for taxpayers' money [59,63]. Embedded within public dental contracts may be structures or processes that restrict GDPs' local decision-making as a means of standardising or ensuring equitable access to care [59], for example use of clinical targets for remuneration, qualifying conditions, or prior authorisation for some treatments [41,64,65]. Responsibility for allocating resources and operationalising contracts may be delegated to commissioners or health service managers (and their teams) who negotiate, issue, and/or administer contracts including approving treatments or payments to GDPs [64–66].

In these systems, often characterised by a high degree of oversight and accountability driven by leaders and managers higher up in health authority hierarchies, contract managers or commissioners can come under pressure and scrutiny to deliver services efficiently through effective negotiation of contracts and monitoring GDPs' performance or outputs [59,67]. Pressures on commissioners or managers may be

compounded when finances are tightened further and result in reduced ability on their part to interpret, 'flex' or 'bend' contract rules to facilitate their own interests or needs as well as GDPs' [59,68].

These factors, reinforcing a culture of 'external' oversight and accountability, can trigger feelings of frustration among GDPs and disengagement with the system because they perceive a loss of clinical control or professional autonomy and decision-making power [42,43,45,50,57,69,70]. These feelings may be reinforced by contract rules and regulations which are perceived as onerous or 'bureaucratic' [44,59,71,72].

Over time, this can have the effect of pushing some GDPs away from the public 'system' towards private only care where fewer contract restrictions exist or there is less external oversight or accountability.

CMOC 4. Consensus, business control and trust

The fourth CMOC (Fig. 4) addresses contexts where contracts are proposed, implemented, operationalised or revised with minimal meaningful consultation, communication, co-design or consensus with the frontline profession [35,73,74], and where terms and conditions are perceived as being unfair or less favourable compared to previous arrangements [49,57,73], resulting in opposition from GDPs' and wider professional networks [35,50,75]. Against a backdrop of austerity or tightened financial conditions and low levels of political priority for oral healthcare, contract changes and cuts in spending to dental services (which are often considered separate from wider healthcare services [76]), may be disproportionate and occur sooner than other services [8,34,77].

This context can trigger or reinforce feelings of eroded entrepreneurial or business control[57], disappointment[57] and suspicion or mistrust[44,50,51,59,78,79] of those governing the health system, leading to demotivation[57] and disengagement with the system. These feelings may be felt more prominently among GDP principals or practice owners who have invested in practice capital (held outside the health service) and who hold responsibility for running a business [42,46,49,70,80]. Wariness or mistrust may be reinforced by regulations perceived as punitive in nature, for example 'clawback' of funds for missed clinical targets[44,46,79] and amplified by messages transmitted by others within GDPs' professional networks including stories of perceived historical maltreatment by the state, which may be passed down through generations of practitioners [45,50,59,81].

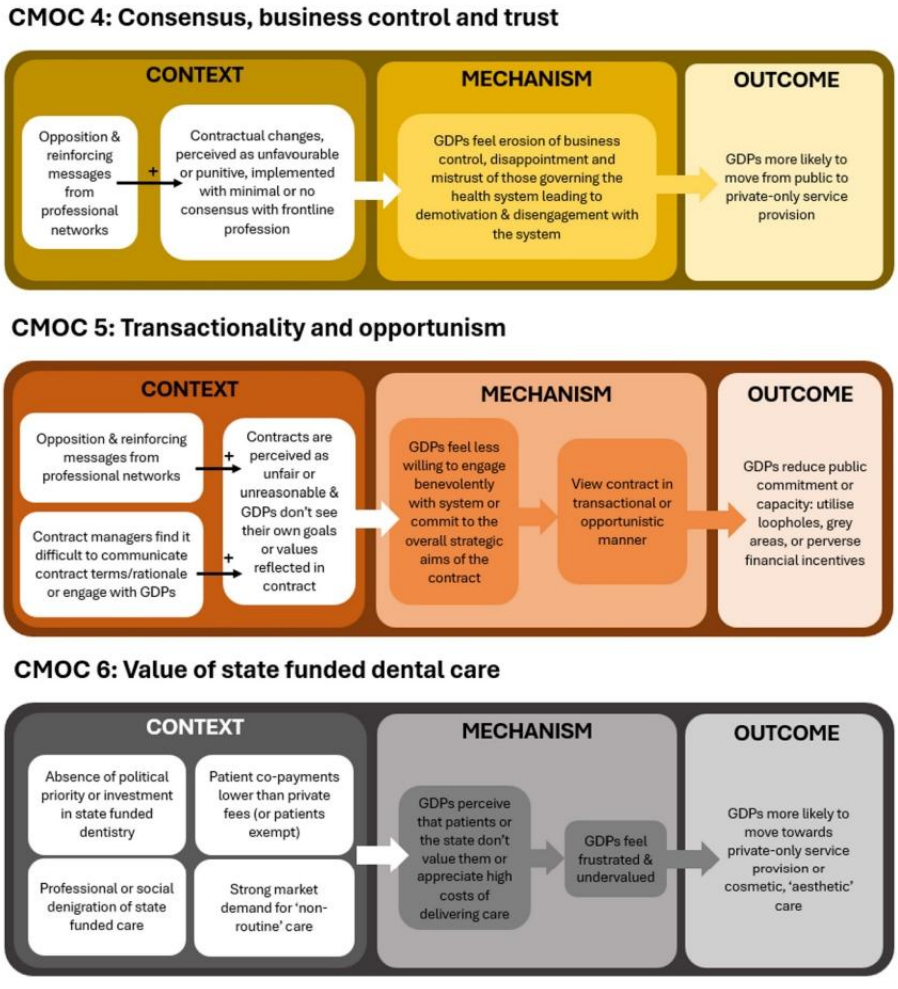

Fig. 4. CMOCs 4–6.

"I suspect whoever came up with them [regulations] tried to make them as ambiguous as possible (perhaps with the intention of tripping up providers when the day of judgement comes)"[79]

This can have the effect of pushing some GDPs away from the public 'system' towards private only care where fewer contract restrictions exist or there is less external influence.

CMOC 5. Transactionality and opportunism

CMOC 5 (Fig. 4) looks at the context where contracts are perceived as being unfair or unreasonable[50,51,80], and where commissioners or contract managers have difficulties communicating the terms or rationale of a contract or engaging constructively with GDP contractors[59] and there is a lack of expertise within or resourcing of their teams [68,73,81]. Against this backdrop, there may be opposition and reinforcing messages surrounding contracts from GDPs' professional networks [45,59,81]. Additionally, some GDPs may not see their own internally driven goals or values reflected in contracts or by those governing the system[54,59,70]

In this context, some GDPs may feel less willing to engage benevolently with the health system [57]. GDPs may disengage with the system by remaining in it, but do not commit to the overall strategic aims of contracts [50,82]. They may treat contracts either in a transactional manner to ensure they do not lose out financially and for the good of their practices[44,50,59,80], or view them as something which can be exploited for financial or personal gain [57,83].

Where they exist, some GDPs will utilise loopholes, grey areas, or perverse financial incentives within contracts because they perceive this to be a legitimate response to unfavourable contract terms [84]. Examples of such behaviours include selecting or tailoring their case mix (e.g., patients with lower unmet needs) or undertaking select procedures only [85].

CMOC 6. The value of state funded dental care

The sixth, and final CMOC (Fig. 4) examines the context where there is an absence of political and health systems priority for, and investment in primary care dentistry [34,37,38,81] (compared to other health or oral health services, which may garner greater political interest owing to societal demand) and where there is limited societal importance placed on routine oral healthcare [86], but where there may be strong market demand for non-routine, 'cosmetic' care [59,87]. Furthermore, there may be stigma and denigration of state funded dental care among the profession[45,70,88], and some within wider society[44,89], where it may be perceived as 'second rate/tier'.

In this context, and where contracts feature patient co-payments (as a means of controlling demand and containing costs), but where these are low compared to private fees (or patients are exempt from payment), some GDPs can feel undervalued as professionals because they perceive that patients [45,54,69,71,86], or the state do not value them (as dentists providing state funded care) or state-funded dental care itself [44,45,55,75] or appreciate the high costs of delivering care, for example if patients question the cost of co-payments (set by the health authority) or do not attend their appointments [71,80].

"The largest problem I see is patients do not value what they are receiving from DWP (or [Medicaid]…They have no idea that there is a cost of doing business"[71]

This can cause GDPs to move away from public care provision towards private-only care or non-routine care (e.g., facial aesthetics) where there may be greater appreciation for services provided.

3.3. Final programme theory

The final programme theory is informed by the six separate, but inter-linked CMOCs (Figs. 3 and 4). Each contextual factor relates or can trace its origin to oral health policies where primacy is given to treatment-intensive, dentist-centred care models and their knock-on effect on the functioning of state-funded primary dental care services which rely on GDP-contractors. Jurisdictions in which this programme theory holds most relevance are those impacted by a lack of political priority for oral healthcare, restrictive fiscal policies, and where health systems' emphases are on efficiency and managerialism. These high-level health system factors can have knock-on effects on how publicly funded dental contracts are designed, implemented and operationalised. How contracts and those managing them are perceived by the profession can subsequently trigger a range of sentiments and behaviours among GDPs which can then influence their decisions to provide care on behalf of state health authorities or not.

The dichotomous relationship between the continued use of contracts where the emphasis is on 'curative' care ('drilling and filling') delivered by dentists on the one hand, and the subsequent requirement to control costs and deliver services efficiency by limiting GDPs' autonomy on the other, can have a profound and negative impact on how GDPs perceive their ability to make clinical decisions in the best interests of their patients, practice the type of dentistry they want to, and maintain an income without undue external pressure. This can lead to the creation of contexts where contracts are perceived as unfair, especially where abrupt changes are made or where there is limited professional engagement or 'buy in'. Additionally, the influence of others within the wider profession in amplifying messages of unfairness, coupled with an inability or difficulty on the part of contract managers (who themselves may be resource constrained or subject to system pressures) to engage or communicate effectively with the profession, can trigger or reinforce a sense of powerlessness, mistrust of the system and agnosticism or opportunistic attitudes towards state-funded care among GDPs.

Finally, the role of perceived lack of professional value in motivating GDPs to engage with the public system is key, and is influenced by some of the aforementioned factors, namely low political priority for and investment in primary dental care as well as limited societal importance for routine oral healthcare. For frontline GDPs, the manifestation of this can come in form of low reimbursement or co-payments and non-compliant patient behaviour. This is important when state-funded primary dental care contracts exist within diverse markets where non routine and 'private' dental care may be viewed more favourably among GDPs.

4. Discussion

4.1. Strengths and limitations

A key strength of this research is that it helps fill a significant research gap, utilising a realist review to directly inform the issue of GDPs' decisions to participate in publicly-funded contracted primary oral healthcare from a broad, high level health systems perspective wherein we have unearthed modifiable contexts applicable to systems which utilise contracted primary oral healthcare models. As part of this synthesis, we utilised the RAMESES realist review standards to inform our methodology, including searching, reviewing and synthesising the literature [29]. Another strength of this review is the involvement of a range of stakeholders including content experts and frontline GDPs. PAG members helped inform and strengthen our analysis by confirming, refuting or suggesting modifications to the emerging findings of our CMOCs.

Like other realist reviews, this study is reliant upon, and therefore potentially constrained by the availability of relevant literature. Furthermore, as we adopted a broad approach focussing on high level systems features, it was not possible for us to consider any and all possible factors influencing GDPs' decisions to take up or resign from public contracts (e.g., at individual or practice level *per se*). One limitation of this study is the paucity of literature and mechanistic data from outside the UK or North America. This may impact the generalisability

of our findings to other health systems globally. While this shortcoming may, in part, be reflective of the search strategy, it is likely attributable to a dearth of qualitative research in this subject area from outside the aforementioned regions. Supplementary searching did not identify additional sources of mechanistic-rich or outcomes-related data from elsewhere. Another limitation of note is that the majority of peer-reviewed studies identified were weighted disproportionately towards the perspectives of individual practising GDPs who were generally dissatisfied with public care contracts. We found that peer reviewed oral health literature specifically investigating this issue from a broader health systems or policy perspective is largely lacking. Adjunctive and grey literature searches did however identify data which complement our findings with respect to health systems contexts (e.g., funding, resourcing, efficiency).

4.2. Meaning of this study within the body of existing literature

This realist review comes at a time when health systems are increasingly experiencing workforce shortages including in oral healthcare, notably in state funded primary care services. This has resulted in impeded access to routine care for many people, often those who need it most, including children and vulnerable adults [12,38]. Our findings, therefore, are timely as systems look to widen access to affordable care and reduce oral health inequities in line with WHO commitments. In Ireland, for example, the government is implementing *Smile agus Sláinte* – National Oral Health Policy (2019) [90] which seeks greater provision of publicly funded care by private GDPs at a time when the number of dentists participating in the DTSS is in significant decline. To our knowledge, the exact reasons behind this decline have not been formally investigated through primary research but are reported to include many of the same factors identified in this review, e.g., contract constraints and funding cuts introduced during the economic downturn in 2010 [91]. In the United States, factors such as burdensome programme administration and non-compliant patients (for example those who do not attend appointments) are understood to be contributory factors influencing general dentists' decisions to participate in Medicaid and CHIP (as well as low remuneration) [92–94]. As part of this review however, we found that US-based literature yielded limited mechanistic-rich or broader health systems-related data pertaining to GDP engagement in government programmes there.

In England, the issue of the NHS GDS contract and its impact on patient access to care has long garnered the attention of health services researchers, the media, and politicians, most notably following the introduction of the 'new' target-based, bundled care contract in 2006. Reports of long queues to 'register' with NHS dental practices [95], increased hospital attendances due to unmet oral health needs [96], 'DIY dentistry' [97] and the emergence of 'dental deserts' [98], especially in rural and coastal areas have pushed the issue to the top of the political agenda. This review builds upon the findings of several UK-focussed non-realist reviews, many of which highlight issues relating to GDP recruitment and retention or job satisfaction. In their 2023 scoping review exploring workforce challenges, Evans et al. found several factors affecting recruitment and retention of GDPs in the NHS [9]. Like our review, a frequently cited factor was the NHS England contract which was described as 'fundamentally flawed' and responsible for driving dentists 'out of the profession' due to targets, high workloads and burnout. Other reported factors aligning with our findings included suboptimal remuneration and limited opportunities for career progression in primary care. In contrast to our review, other non-health systems specific factors were identified, namely practice rurality and poor transportation links. Similarly, in their 2024 literature review examining factors contributing to job dissatisfaction among UK GDPs, Holloway and Chesnutt also identified many of the same factors highlighted in our review, including restrictive contracts and associated time pressures [20]. In contrast to these reviews and wider literature investigating dentists' perceptions, this realist review addresses an absence of knowledge surrounding the influence of factors at health systems level on GDP behaviour and engagement.

Although theirs was not a review or primary research, in their 2012 analysis, Brocklehurst and Tickle utilised 'systems thinking' as a means of developing an oral health workforce planning tool which considered the interactions, delays and feedbacks that influence the balance between the various components of the health system [16]. Building upon earlier work by Masnick and McDonnell [15], they examined the complex interactions between factors on the demand and supply side of care in the NHS and suggested that the net flow of dentists in the system was dependent on a myriad of factors including the right legislative environment and contractual arrangements, financial support and incentives, skill mix utilisation and market forces driven by people expressing a need for care.

4.3. Policy and practice implications

The CMOCs and final programme theory provide the basis for a series of systems-level actions that could inform meaningful change when it comes to developing and implementing new policies, strategies or service reforms, leveraging GDP engagement and increasing participation in publicly funded services.

4.3.1. Engagement, transparency and consensus on services

One of the main findings to emerge from this review is perceived lack of control among GDPs and apparent absence of consensus and trust between them and health systems governors. From a policy perspective, there is need for debate and agreement about what universal oral healthcare is, and how this translates into the design of state-funded services, including who is best placed to deliver those services. Contemporaenous epidemiological data will be needed to inform evidence based decision making. This debate will be informed by conversations already underway at a global level, buoyed by the WHO Global Oral Health Action Plan, and in the wake of the COVID-19 pandemic when the importance of oral health as an essential aspsect of health came to the forefront [99]. Crucially, engagement with and open dialogue between stakeholders, including policymakers, health system actors, the dental profession and service users, with the aim of finding and aligning common, realistic goals should be viewed as a priority. Inviting GDPs to have a seat at the discussion table, and affording opportunities for their views to be heard will be key in this endeavour. Conversely, transparent communication regarding policy direction and intent, including the challenges of planning and resourcing services has the potential to develop relationships that are built on mutual understanding and trust.

The role and value of meaningful engagement with dentists in informing the direction of oral health policy, systems design and contract reform has been demonstrated [100,101]. Following the publication of the UK Houses of Commons Health Committee Report on dental services (2008), work began in 2010 on the Dental Contract Reform (DCR) programme which saw new NHS contracts being piloted across England. Under these prototype arrangements, GDPs were remunerated via a blend of capitation and activity-based payments with increased incentives for prevention and the promotion of skill mix utilisation within teams [102]. In contrast to changes implemented in 2006, the DCR programme sought the design of new contracts with GDP support and engagement [103]. New arrangements garnered mixed reactions and support from GDPs, with some citing difficulties in achieving targets and changing patient behaviour [104]. The DCR programme in England ceased in 2022 as it was deemed not to have met its objectives, including increasing patient access [105].

4.3.2. Optimal investment, fostering autonomy and job satisfaction

Central to any debate around how services are designed and delivered will be how funding and resources are allocated, ensuring value for tax payers' money, while facilitating optimal population oral health outcomes and fair reimbursement for services provided. Funding

envelopes remain constrained globally, therefore in tandem with discussions on UHC for oral health, there is a need for increased investment in services where feasible. Notwithstanding the challenges associated with funding and resource allocation, a key focus in any service design or operation should be the creation of working environments which promote GDPs' (and wider team members') sense of professionalism, altruism, clinical and entrepreneurial autonomy, and which facilitate the practice of high quality, contemporary care, where prevention is at the forefront and appropriately rewarded [106]. A move away from contracts where outputs and outcomes are measured in individual items of dental treatment to those which focus on holistic care and quality outcomes could be explored. This is of particular importance at a time when the oral healthcare market is diversifying, the demand for lucrative 'non-routine' care, including cosmetic dentistry and facial aesthetics is growing, and early career dentists face substantial debts to repay [87, 107]. Dentists have greater choice than ever in terms of how they chose to utilise their skills, therefore the challenge for policymakers and health systems managers will be how best to accommodate and increase the appeal of routine primary oral healthcare in this changing landscape.

4.3.3. Flexibility and career development

At local and regional levels, affording health service managers greater flexibility in how resources are allocated and services are operationalised to best suit population needs while also taking into account the skills and views of GDPs and their teams, has the potential to further nuture a culture of shared decision making and trust, and engender a greater sense of professional value among practitioners. Where opportunities for skills development and career progression can be encorporated into contractual frameworks, these should also be explored. Evidence suggests that early career dentists in particular, value variety and posts which facilitate further skills development and career escalation [48,108]. Across England, a number of 'flexible' commissioning exemplars see block or previously unspent NHS contract funding allocated to GDPs to provide bespoke care packages tailored to local need [109,110]. In Greater Manchester where health planning and spending is devolved locally, a scheme to increase access to care for paediatric dental patients has proved popular with GDPs who receive additional NHS funding as well as training and support from specialists as part of this initiative [111,112]. Similarly, the development of a level-2 (enhanced skills) complexity training programme in paediatric dentistry has garnered significant interest among GDPs in the Yorkshire and Humber region. Under this programme GDPs receive additional hands-on, accredited training by consultants in paediatric dentistry following which they can receive a sessional rate of pay to deliver enhanced NHS paediatric care in their own practices [113,114].

5. Conclusion

This realist review of GDPs' participation in publicly funded, contracted primary oral healthcare services identified several important health systems contexts. These include emphasis on treatment rather than prevention, low priority for oral healthcare, funding and resourcing constraints, high external oversight and managerialism, and change implementation or contract operation with minimal frontline clinician consensus. At operational level, contracts can restrict GDP decision-making and ability to deliver high quality, contemporary and holistic patient care. Key underlying mechanisms were feelings of ceded clinical and entrepreneurial control, mistrust of those governing health services, feeling undervalued, stress and low morale, leading to demotivation and disengagement with the system. These contextual factors, drawn from a robust evidence base, are a good place to start to leverage health system change including improved GDP engagement, and increase participation in publicly funded systems, which ultimately is a component of providing universal access to quality primary oral healthcare for patients.

CRediT authorship contribution statement

Paul Leavy: Writing – review & editing, Writing – original draft, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Sophie Mulcahy Symmons:** Methodology, Investigation, Data curation. **David Mockler:** Methodology, Data curation. **Pádraic Fleming:** Supervision, Methodology, Conceptualization. **Blánaid Daly:** Writing – review & editing, Validation, Supervision, Methodology. **John Ford:** Writing – review & editing, Supervision, Methodology, Formal analysis. **Sara Burke:** Writing – review & editing, Supervision, Methodology, Formal analysis, Conceptualization.

Declaration of competing interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Supplementary materials

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