A Vision for Population Health Management to Support Integrated Care

SMART D8 – Optimising Data to Integrate Health and Social Care

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Outline

Definition and AIMS

Core Building Blocks

Tools to target those in need, population segmentation and Risk stratification

Population Health Maturity Matrix

Developments in the Irish context

Key Success Factors

Key Learnings

Population Health Management (PHM)

The concept of aggregating population data with data from multiple care and service settings, the analysis of that data into a single, actionable patient record, using the insights gained to identify their specific health care needs and to develop a tailored response to them through

- use of data analytics, artificial intelligence and digital technologies,

- by stratifying populations according to risk of deterioration in health.

This allows faster access to, and greater accuracy of, diagnostic tests and use of personalised treatment plans.

Aims of PHM

Source: (NHS England, Public Health England, & NHS Digital, 2016)
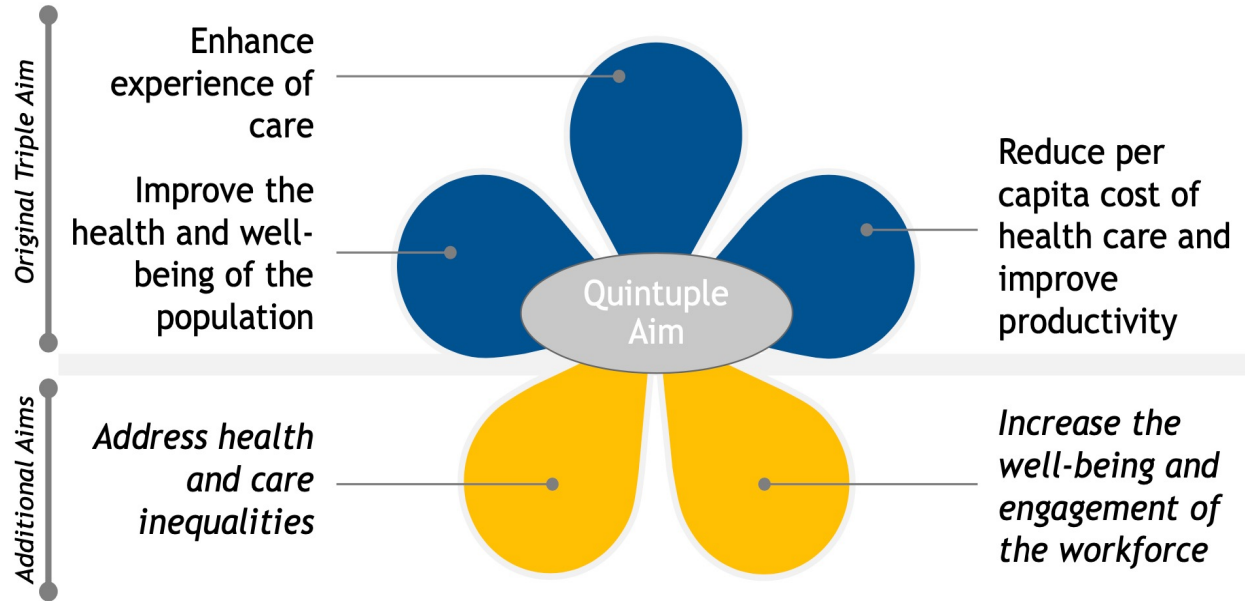
Core building blocks for successful implementation of PHM

Source: PHM flatpack: PHE and NHS Digital 2016

infrastructure (the basic building blocks which must be in place)

intelligence (opportunities to improve care quality, efficiency and equity)

intervention (care models focusing on proactive interventions to prevent illness, hospitalisation and address inequalities).

Policy shift towards integrated care (Slaintecare) and geographically based systems :

- **individual level** PHM can help personalise care according to need

- **neighbourhood level** care pathways and interventions can be considered - suggested population 50K (approximates to CHN)

- **place level** PHM techniques should inform integrated care design - suggested population 250-500k (approximates to CHO)

- **system level** can inform strategic planning of large scale prevention or tertiary services - suggested population 1 million (approximates to RHA).

Core Building Blocks – Infrastructure

Elements

- shared and effective leadership

- defining the population in question-population profiling

- having an agreed information governance structure

  - transparency,

  - adequacy of what data is shared,

  - data sharing agreement in place

- basic elements of digital and data infrastructure in place

- capacity and capability within the system - current and future

Core Building Blocks – Intelligence

Elements

- Understand population health need including unmet need

  - Population Health Profile

  - Workshop across relevant partnerships to critically review the data in the context of the system - System Level Workshop

  - Prioritisation of Need - Ideally 3-5 priority areas

  - Opportunity analysis can be undertaken by Public Health Departments to determine which areas of focus might best meet the current organisational and population requirements

- Use of tools and techniques to align need with effective interventions.

Core Building Blocks – Interventions

Elements

- Identifying effective, evidence-based interventions and implementing them

  - Design care models, interventions and implementation plans based on evidence to target priority patient groups

    - Not necessarily about making wholescale changes services adapted or tweaked e.g., social prescribing

    - Multiple interventions may be needed at different levels

      - System level e.g. needs assessments, predictive modelling and impactability tools can highlight population level need or gaps in care

      - Individual level analysis e.g. where individuals who are identified as being at high risk but not receiving effective interventions

- Match up effective evidence- based interventions with the gaps in need.

Population Segmentation

Macro level integrated care models. **Bridges to Health. (Source: Lynn et al.,2007)**

Segment	Description	IOM/AHRQ Goals for Healthcare
1	Healthy	Staying healthy
2	Maternal and Infant Health	Staying healthy
3	Acutely ill	Getting well
4	Chronic conditions, normal function	Living with illness or disability
5	Stable but serious disability	Living with illness or disability
6	Short period of decline before dying (mostly cancer)	Coping with illness at the end of life
7	Limited reserve and exacerbations (organ failure)	Coping with illness at the end of life
8	Long period of decline from frailty with or without dementia	Coping with illness at the end of life

Risk stratification

Meso level integrated care models

Focus on specific sub populations - uses segmentation to choose e.g.

ValCronic-CARS pilot program in Spain - stratification of patients with chronic diseases in three risk levels:

- High risk (level 3), patients with more complex and frequent comorbidity;

- Medium risk (level 2), low complexity with respect to their comorbidity; and

- Low risk (level 1), chronic patients in early stages.

Detection through CARS via Tablet /PC/ Smartphone to EPR – confirmed by doctor triggers a training programme for the patient and caregiver. Matrix of 16 actions adapted to patient need depending on risk level.

Risk stratification (2)

Micro level integrated care models

These require high risk patients to be identified.

A district health board in New Zealand is including an automated risk score in its e-summary health record, which is available to all system providers across care settings.

The risk algorithm stratifies patients into two groups:

- patients at very high risk, who receive intensive care management,

- and those at risk who are assigned a care coordinator from their local practice.

Requires primary care providers to have up-to-date access to linked data sets in which patients are identified.

Before – after evaluation (6 months) Emergency care presentations ↓ 45% ,
Acute bed days ↓ 35%

Population Health Maturity Matrix

	Emerging	Developing	Maturing ICS	Thriving ICS
Infrastructure	• Limited use of local data. Reliance on national data to undertake analysis for planning and commissioning activities.	• Some linking of traditional data flows between primary and secondary care. • Information governance arrangements in place between commissioners and primary and secondary care providers	• Linked primary, secondary, community, mental health care data available for direct care and care redesign, with plans to link wider data sources, including social care and other wider determinants • ICS wide Information Governance arrangements which support analysis of linked data for care design including wider determinants	• Full flows of data from all health and social care sources available for direct care and care planning, including demonstrable efforts to link patient level information on wider determinants (housing, unemployment, income etc). • System wide information governance arrangements which allow for analysis of de-identified patient level data for care design purposes and smooth re-identification within ICPs and PCNs for proactive case finding and management.
Intelligence	• Disparate analytical teams spread across the system mainly undertaking traditional commissioning and reporting activities • Limited intelligence tools to help with understanding population health demands.	• Traditional reporting, intelligence systems and analytical outputs acting at organisation level with limited clinical engagement. • Use of analytical teams and support units to provide population health analytical insight, but not in a systematic and consistent way.	• Starting to use local linked data to segment and stratify population to understand needs of different patient groups and risk factors. The costs of different cohorts are understood now and in the future.	• Well developed cross ICS analytical function with skills in predictive techniques that enables actionable insights to be regularly delivered to PCNs and Place networked or federated analytical teams. • Analysis which shows current and future costs of different cohorts, key risk factors (across health and wider social needs) and those patients who are at greatest risk of a deterioration in health and care.
Intervention	• Largely reactive health and care system delivered by providers where there is minimal collaboration.	• Basic population segmentation in place to understand needs of key groups with early insight into resource use.	• Forums and working arrangements being established between primary and secondary care, social care, and public heath teams - and with third sector involvement - to design proactive care models for different patient groups based on patient level analysis.	• Clearly defined care models in place for key population groups across vertically and horizontally integrated teams. • A range of anticipatory care interventions have been designed and financial incentives put in place to support implementation through PCN MDTs.

Developments in the Irish context

- DOH – PBRA, Workforce Planning Project

  - the WTE's needed and training required for pop. based planning

  - ESRI - the acute cost per segment and the per capita cost on a multi annual basis

  - Irish Government Economic Service – continuing costs

  - Pilot testing of the resource allocation will be directed initially to hospital groups and CHOs

- HSE

  - E-health Ireland has been assigned to build and operate the IHI Register of unique health identifiers on the basis of personal data. It will form basis for Electronic Health Record

  - Chronic Disease Management Programme (CDM)

  - ICPOP

Key success factors for PHM

- Agree a definition and a strategy

- Define goals and measurement

- Stratify the population

- Select a risk stratification algorithm using accessible datasets

- Define and design tailored interventions and

- Measure success using appropriate indicators.

Three domains, people (suitably qualitied staff), the process (statistical tools) and technology are needed.

Feedback loops or continuous improvement cycles to capture learning.

Key Learnings

Building trust - creation of TRE is key – independent third party for EPR register

- Developing relationships between data holders, NGOs, statutory service providers and academic researchers have been critically important factors

- Strict controls around access

Population segmentation tools - tension between simplicity and precision in use

- Better definition of the content of segmentation analysis and alignment with intervention steps,

- Demonstrate its added value, in particular its economic viability,

Use of **risk stratification** to identify 'at risk' patients before they deteriorate

Implementation- well-supported, funded programmes given sufficient time to develop are most likely to demonstrate benefit.