Trinity College Dublin
Coláiste na Tríonóide, Baile Átha Cliath
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The Impact of Driving Restrictions on People with Epilepsy in Ireland

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Submitted for publication on January 20, 2025

Course code: CM8806-202324

Trinity College Dublin

School of Medicine

M.D. Thesis

Acknowledgment

Special thank you to Professor Kumlesh Dev for supporting my MD throughout the past 3 years and also for giving me invaluable training in performing research and scientific writing during my M.Sc. in Neuroscience. Thank you to Professor Norman Delanty in Beaumont Hospital for guiding and helping me to create this project along with Peter Murphy from Epilepsy Ireland. Thank you the my colleagues in Beaumont, especially the Advanced Nurse Practitioners, who were invaluable in patient recruitment.

In addition, thank you to Professor Colin P. Doherty and Professor Román Romero-Ortuño for their support in St. James's Hospital.

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____Dr. Stephen P. Klaus____ __ 31-01-2024___

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Preface

Index of abbreviations

PWE	People with epilepsy
RSA	Road Safety Authority
ANP	Advanced nurse practitioner
EEG	Electroencephalogram
ILAE	International League Against Epilepsy
BH	Beaumont Hospital
SJH	St. James's Hospital
DMV	Department of Motor Vehicles
RTA	Road Traffic Accident
MRI	Magnetic Resonance Imaging
NCHD	Non-consultant hospital doctor (resident)

Scientific abstract

Driving restrictions have a significant impact on patients with epilepsy and their families. This is documented in international studies but underreported in an Irish context. The goal of this study was to examine this impact on an Irish-based tertiary hospital cohort. Patients were recruited through the Beaumont Hospital neurology service after having been informed of a driving restriction due to an epileptic seizure. Interviews were conducted by phone, using a standardized proforma.

Our analysis included 23 patients interviewed (female 65%, mean age: 45.8 years). Forty-eight percent of patients (n=11) had received a driving restriction for the first time, following a new diagnosis of epilepsy. 96% of patients (n=22) identified a car as their primary mode of transport prior to driving restriction, with one patient (n=1) using public transport. During restriction, 60% (n=14) continued to be dependent on use of a personal car driven by a friend or family member. 13% of patients (n=3) switched from primary personal car use to public transport. 83% percent (n=19) reported some access to public transport. 35% percent (n=8) of patients reported that their transportation options were limited by cost, while 55% percent (n=11) reported being negatively affected financially with 17% percent (n=3) were forced to give up their job. 13% (n=3) reported a negative impact on the doctor-patient relationship, with one patient seeking a second opinion. 9% of patients, (n=2) reported driving during the period of restriction. Quality of life and subjective happiness scores were compared across subgroups, although significance was not observed.

A personal car is the primary mode of transport in this cohort both before and after driving restriction. The majority of patients adhered to the law and did not report a breakdown in the relationship with their doctor. Access and cost of public transport, reliance on family and financial loss are significant factors affecting patients.

Lay Abstract

Epilepsy is a common condition affecting 1% of people or approximately 50,000 people in Ireland. People are required to stop driving after having a seizure. Previous research internationally has shown that this strongly impacts quality of life, independence, along with causing problems with employment and social interaction. This is however underreported in Ireland. We aimed to investigate this among a group of patients attending an large Irish hospital.

We interviewed 23 patients currently not driving because of a seizure and examined the personal, societal, and financial impact on them. This cohort reported low quality of life, changes in mode of transport, loss of employment and financial loss.

The findings suggest that driving restrictions were negatively impactful in this cohort and this is likely representative of many Irish patients with epilepsy. The work aims to inform both patients and doctors, and aid in advocacy efforts.

Automated readability index: 12.18

Output – Presentations and Publications

1. **Beaumont Hospital – Journal Club 2021**
    - *"Epilepsy and Driving in Ireland"*
    - Attended by Beaumont Hospital Neurology Staff including consultants and NCHD's
2. **RCPI Traffic Medicine Research Webinar 2021**
    - *"An early analysis of an ongoing project examining the impact of driving restrictions on patients with epilepsy"*
    - https://courses.rcpi.ie/product?catalog=Traffic-Medicine-Research-Webinar-2021
3. **ILAE International Epilepsy Conference 2021 – August 28 – Sept 1st**
    - *"An early analysis of an ongoing project examining the impact of driving restrictions on patients with epilepsy"*
    - https://onlinelibrary.wiley.com/doi/10.1111/epi.17079
4. **RCPI Traffic Medicine Research Webinar 2022 – Thursday May 5th**
    - *"Examining the impact of driving restriction on patients with epilepsy in Ireland"*
    - https://courses.rcpi.ie/product?catalog=Traffic-Medicine-Research-Webinar-2022
5. **ILAE North American Epilepsy Conference 2022 – May 5th – 8th Online**
6. **Irish Neurological Association Meeting 2022 – Platform Presentation**
7. **ILAE International Epilepsy Conference 2023 – Poster & Presentation**
    - *"An updated examination of transport use during driving restriction in patients with epilepsy in Ireland"* 1047
    - *"Examining the financial impact of driving restriction on patients with epilepsy in Ireland"* 1174
    - https://www.ilae.org/files/dmfile/iec2023-abstractbook.pdf

8. **St. James's Hospital – Epilepsy Department meeting 2023**

I. Introduction

A. Background

1. Overview of Epilepsy

Epilepsy is a chronic disorder of the brain with a myriad of aetiologies and clinical syndromes. It is characterized by recurrent seizures, episodes of disturbed brain function due to synchronized abnormal neuronal discharges. The WHO estimates the prevalence of epilepsy worldwide is approximately 50 million people with an incidence of 5 million people annually. Epilepsy is almost 3 times more likely to be diagnosed in a lower income country, a fact attributed predominately to neuroinvasive infections including neurocysticercosis (WHO, 2023). Lifetime risk of developing epilepsy is estimated at 3% or 1 in every 25th person (Hesdorffer et al., 2011).

The prevalence of epilepsy in Ireland is in keeping with worldwide data revealing that 1% of the adult population is affected. This was estimated to be 31,000 people in 2010 (Linehan et al., 2010) with the most frequent causes including mesial temporal sclerosis, tumour, trauma, stroke, and cerebral developmental abnormalities (Delaney et al., 2020).

The modern definition of epilepsy as defined by the International League Against Epilepsy (ILAE) official report of 2014 is:

"*(1) At least two unprovoked (or reflex) seizures occurring >24 h apart;*

(2) one unprovoked (or reflex) seizure and a probability of further seizures similar to the general recurrence risk (at least 60%) after two unprovoked seizures, occurring over the next 10 years;

(3) diagnosis of an epilepsy syndrome" (Fisher et al., 2014).

People with epilepsy (PWE) are diagnosed following review of the patient's clinical history, the seizure semiology & with the aid of diagnostic tests including electroencephalography (EEG), magnetic resonance imaging (MRI) of the brain and increasing, a genetic profile.

The varied nature of seizures and the diverse manifestations of the disorder contribute to the difficulties seen in diagnosis and management. Harry Lee Parker, in his seminal work, "*Clinical Studies in Neurology"*, described two distinct forms of epilepsy, one being of a more benign nature, controlled with anti-seizure medication, and not requiring frequent medical intervention. Representing the other half of PWE, those with a more "*malignant*" phenotype, refractory to intervention and suffering from recurrent seizures throughout their lifetime (Parker, 1956).

As we discuss driving among people with epilepsy (PWE), those suffering from both forms of epilepsy are restricted from driving. The difference being those with better control of their epilepsy frequently have their driving privileges reinstated and will return to the road.

2. Mobility in Chronic Health Conditions including Epilepsy

The ability to move about freely has a direct impact on health, personal welfare, and social integration. Community engagement is defined by personal mobility and allows for sustaining family ties, social engagement, educational pursuits and recreation. For those with chronic health conditions, maintaining reasonable mobility is essential to effectively manage their disease. Restricting mobility in patients with chronic disease creates an inequity in healthcare delivery and negatively impacts personal autonomy.

With regards to epilepsy specifically, preserving mobility is imbued with additional layers of complexity. Seizures alter an individual's capacity for vehicular operation, and therefore creates a public safety risk which must be mitigated. A person with a diagnosis of epilepsy, especially those diagnosed in adulthood, are often forced to tackle the consequences of the condition of two fronts. Firstly, managing the disorder and the potential adverse effects of anti-seizure medication (ASM), but also the newly acquired disorder of mobility which often results in a PWE needing to change aspects of their employment and personal life.

As this thesis aims to illustrate, the many arms impacting patients receiving a driving restriction extend far beyond transportation. As PWE, and all those with chronic disease, have an increased burden of healthcare requirement, the ability to attend appointments is either reduced substantially, leading to virtual appointments, or patients become dependent on friends or family to ensure attendance. The inability to drive is known to cause social withdrawal, increased dependence on others, and reduced self-esteem (Harden et al., 2007). Reduced social interaction means PWE are not attending parties, birthdays and family gatherings. A reduction in self-esteem likely further restricts people's desire to participate in society. This highlights the essential need for initiatives, both private and governmental, that improve access to transportation options for PWE. In many instances, these plans fall short of their intended goal and despite important efforts, the impact of lost personal freedom is substantial.

3. The Historical Context of Driving Restrictions for PWE

When the understanding of epilepsy as a clinical syndrome was first developing, an effective set of medications to treat seizures did not yet exist. The lack of available treatments, combined with the unpredictable nature of seizures, led to an overly cautious attitude towards PWE. This stance limited opportunities for not only recreational activities including cycling, swimming and horseback riding but also the prospect of employment and marriage.

The proliferation of automobiles created a novel and pressing need to adequately address health conditions which impact driver safety. This resulted in the initial formulation of driving restrictions for those with episodes of loss of consciousness, either due to a seizure or otherwise. However, these restrictions were largely inconsistent and instituted sporadically without a regulatory framework. Not until many decades later did an evidence-based approach began to inform policy, integrating clinical data on seizure control and recurrence to develop more equitable guidelines for driving with epilepsy.

Furthermore, the approach to licensing drivers with epilepsy has historically been heterogeneous, with countries adopting varied standards. For the vast majority of PWE, they were almost certainly subjected to a lifetime prohibition from driving. The transition into modern healthcare brought an individualized assessment of driving capabilities. This patient-centred approach evaluates several factors, including the categorization of seizure types—ranging from focal aware to generalized tonic-clonic seizures—the temporal pattern of seizure occurrence, the predictive reliability of auras, and overall seizure control and is designed to allow clinicians to stratify risk when implementing and rescinding driving restrictions.

The current landscape sees countries with instituted guidelines allowing for conditional driving privileges for people with epilepsy. The regulations are predicated on a demonstrable period of seizure freedom and the risk of recurrence.

4. The Development of Driving Law Incorporating Medical Fitness in Ireland

The concept of medical fitness to drive in Irish law essentially began with the publication of the Road Traffic Act of 1961. Notably, this document does not contain any mention of seizure, epilepsy, or loss of consciousness. On the section entitled: "*Disqualification on grounds of health*," the breadth of the subject is covered in two passages.

(1) "This section applies to a person suffering from any disease or physical or mental disability declared by the Minister by regulations to be a disease or disability such that a sufferer therefrom shall be disqualified for holding any driving licence whatsoever."

(2) "A person to whom this section applies shall be disqualified for holding any driving licence whatsoever during the period during which he is suffering from the relevant disease or disability." (ISB, 1961).

From this is can be assumed that sufferers of epilepsy were not given license to drive. Furthermore, as epilepsy is a chronic illness, this disqualification amounted to a lifetime ban. Although epilepsy is varied among individuals, this regulation made no allowance for the diverse phenotypes exhibited in PWE and how their driving may be affected.

By the 1990s, there was a shift to a more structured and equitable approach. The Road Traffic Act of 1999 legislated provisions on driving licenses in the context of medical fitness and for the first time a section on "Health and Fitness" was explicitly outlined (ISB, 1999).

In 2011, the publication of the first 'Sláinte agus Tiomáint', the Irish medical fitness to drive guidelines were a milestone in Irish road safety (Mudiwa, 2013). They provided a blueprint for assessing the impact of a spectrum of medical conditions on driving ability and were developed with input from medical specialists in conjunction with the National Office for Traffic Medicine (RSA, 2022).

The regulations delineate specific criteria for individuals not only with epilepsy, but also a range of neurologic conditions including stroke, brain tumours and syncope. The duration of driving restriction varies based on the underlying condition ranging from 30 days following a stroke to two years for some patients with cerebral tumours (RSA, 2022).

These requirements are published online on the RSA's website with the newest edition available as of April 2022 (RSA, 2022). The guidelines provide a framework for safely evaluating clinical scenarios with respect to driving for clinicians not only working in epilepsy, but also in emergency departments, internal medicine, and general practice. Importantly, the guidelines are also available to the general public and therefore require an appropriate level of accessibility and readability.

Modern guidelines also make a significant differentiation between types of drivers while weighing an abundance of caution on professional drivers (Group 2) in comparison to personal car users (Group 1). This signifies the extra weight placed on those either involved in the transport of others (including lorry drivers & bus drivers), or those who may be driving large vehicles which carry a greater chance of harm during an accident.

The development of driving laws in Ireland governing medical fitness has been a journey from initially not incorporating health related fitness, to then more undefined policies without any allowance for individual considerations, and finally to precise, evidence-based criteria. This defines a public health strategy and a cultural shift towards inclusion, aiming to improve road safety while maintaining fairness in an individual's right to drive.

B. Significance of the Study

Although the study was designed to examine epilepsy patients in a Dublin-based tertiary hospital cohort, the expectation is this group is representative of PWE in Ireland and beyond. Beaumont hospital caters to approximately 10% of the epilepsy population in Ireland, and sees patients living both locally around the North Dublin suburb, as well as a significant number of patients based more rurally in surrounding areas including Co. Meath. As Beaumont is the national referral centre for both neurology and neurosurgery, they attract patients from every corner of the republic. Examining the impact of driving restrictions on this group of PWE aims to highlight the experiences of the broader patient community throughout Ireland and internationally, particular areas where access to public transport is more restrictive.

A major goal of this work is to also improve understanding and empathy among clinicians. Although an improved appreciated of the patient impact should not affect the length of a driving restriction or be used as evidence to not implement one when indicated, it will highlight to clinicians that the impact of this imposed restriction reaches far beyond not having access to a personal car. This will hopefully act as a prompt for physician's to delve into the potential impact on employment, child care and the ability to attend future appointments.

Furthermore, the study findings are expected to support the advocacy of Epilepsy Ireland (EI), a large Dublin based non-profit organisation. EI has a significant position within the Irish epilepsy sphere and promotes equitable healthcare policies and the provision of support services for PWE. They also provide useful and accessible information for patients, including a simplified version of the driving restrictions more appropriate for the intended audience. Patients frequently cite information obtained from EI during clinical interactions.

Specifically, this study's findings will support Epilepsy Ireland's campaign to secure access to the Free Travel Scheme for those affected by driving restrictions. Free Travel in Ireland is currently only available for people older than 65 years old and those receiving disability allowance for which PWE typically do not qualify. This access has previously not received broad support within government despites EI's petitions and proposals. Approval would represent a significant step in reducing the transportation barriers encountered during periods when driving is not possible.

With regards to driving not only in Ireland but throughout the world, it is important to recognise that driving is a privilege and not an inherent right. Therefore the implementation of driving restrictions, carried out in the name of public safety, must be viewed through this lens. PWE are at times quite aggrieved by the lack of the ability to drive due to these restrictions. However, when driving is recognised as a privilege, which is granted by the government to those who follow the rules of driving, safely maintain their vehicle, and abide by road regulations, then medical fitness to drive becomes another pillar of road use which must be appreciated and abided by. It is key to explain this fact to patients and physicians alike, which may assist in helping all members of society better understand why driving can be restricted along with reminding people the responsibility the comes with driving a motor vehicle.

The following sections will first explore Irish driving regulation and compare this across the international spectrum. Following this, the literature review will dissect some of the impacts of driving restrictions previously identified in Ireland and abroad. Finally, our findings will elucidate the effect of driving restriction on the day-to-day lives of people with epilepsy in our cohort, incorporating both quantitative and qualitative findings.

II. Literature Review

A. Epilepsy and Driving Regulations

1. Epilepsy-related driving restrictions in Ireland

The Medical Fitness to Drive Guidelines mandate a cessation of driving following a seizure and are largely guided by European Union directives. They emphasize the significance of seizure events including the effect on function and consciousness, medication adherence, and the circumstances surrounding each seizure in determining driving eligibility. A substantial portion of the Irish populace with medical conditions, including those with epilepsy, face driving restrictions. Although an exact figure is not known, in an audit of patients attending 5 consecutive epilepsy clinics in St. James's Hospital, 61% of patients were not eligible to drive based on clinically reported seizure frequency (Klaus, 2023). Conservatively, it may be assumed that approximately half of the patients attending a typically clinic are currently restricted from driving.

As mentioned previously, drivers are first evaluated based on the type of licence they have or wish to use. Group 1 license holders (private car users) with a diagnosis of epilepsy are required to refrain from driving for one year following the date of last seizure. For those with a single unprovoked seizure, and no other risk factors for epilepsy i.e.: an abnormal MRI brain or EEG, they are restricted from driving for 6 months.

For Group 2 license holders, who operate commercial vehicles including public buses and lorries (large trucks), the law demands a more stringent ten-year period free from seizures without the use of anti-seizure medication. For the first unprovoked seizure, group 2 drivers are required to stop driving for 5 years without the use of an ASM. Therefore, for group 2 drivers, an unprovoked seizure is a career ending event.

The type of seizure, the timing, and potential provoking factors are also considered. Beginning with provoked seizures, neurologists are afforded broad use of their judgement in determining when an individual may return to drive. Factors which are considering provoking include: during pregnancy, convulsive syncope, in the first week following a head injury, and within 24 hours of a stroke or intracranial surgery. Importantly, and often discussed in epilepsy clinics, alcohol and/or drug misuse are not considering provoking factors, even if seizures are clearly happening in the context of alcohol or benzodiazepine withdrawal (RSA, 2022).

Further differentiation occurs with seizures occurring only from sleep versus those during waking hours, the presence of an aura preceding the seizure, and whether the seizure is associated with a loss of awareness. Patients with an established pattern, documented as one year or greater, of nocturnal seizures and / or focal aware seizures without loss of awareness are entitled to drive with completion of the appropriate documentation.

Accessible online through the NDLS website, the guidelines are a dense document consisting of 134 pages, including 30 pages on neurological disorders. To increase accessibility, sections on epilepsy, seizures, and stroke are available as printable leaflets. The document contains a large amount of medical jargon and the details governing PWE are often discussed and debated among clinicians tasked with providing an expert opinion. A review of the epilepsy section reveals a readability aimed at someone in the upper years of high school or college with an API of 12.25. A Flesch Reading Ease score of 37.16 indicates a difficult to read text most suitable for someone in college.

The responsibility for understanding and adhering to these driving regulations lies with the patient and is communicated by healthcare professionals. In instances where a patient fails to comply with the documented driving ban, the physician may be compelled to report this to the authorities under extraordinary circumstances. While this appears to be a rare

occurrence among PWE in Ireland, data is not available to evaluate this sufficiently. This highlights the need for adequate clinical documentation of driving status in the patient's clinical notes. Again, in (Klaus, 2023), a retrospective look at clinical notes revealed driving discussion was not documented in 54% of patients.

Returning to driving after a period of seizure freedom is possible once patients and their consultant complete the D501 Medical Report Form, submit it to the National Driving Licence Service (NDLS), and their insurance company is informed, potentially leading to increased insurance premiums. (See appendix)

PWE, and members of the public acting on their behalf, often cite the guidelines when discussing driving restrictions with their neurologist. Differences in their interpretation are inevitable, especially when driving is concerned. However, the publication of guidelines used by both those implementing and receiving driving restrictions is essential for transparency and maintaining a trustful doctor-patient relationship.

Despite the frequency in which driving decisions are made in a clinical context, there is a notable gap in the literature regarding the effects of driving restrictions within Irish neurology. In clinical settings such as Beaumont Hospital's outpatient department, driving restrictions are routinely addressed and managed as part of standard epilepsy care. Yet, investigation and quantification of this impact remains imperative to understanding and addressing the needs of PWE.

2. A comparison of driving restrictions globally

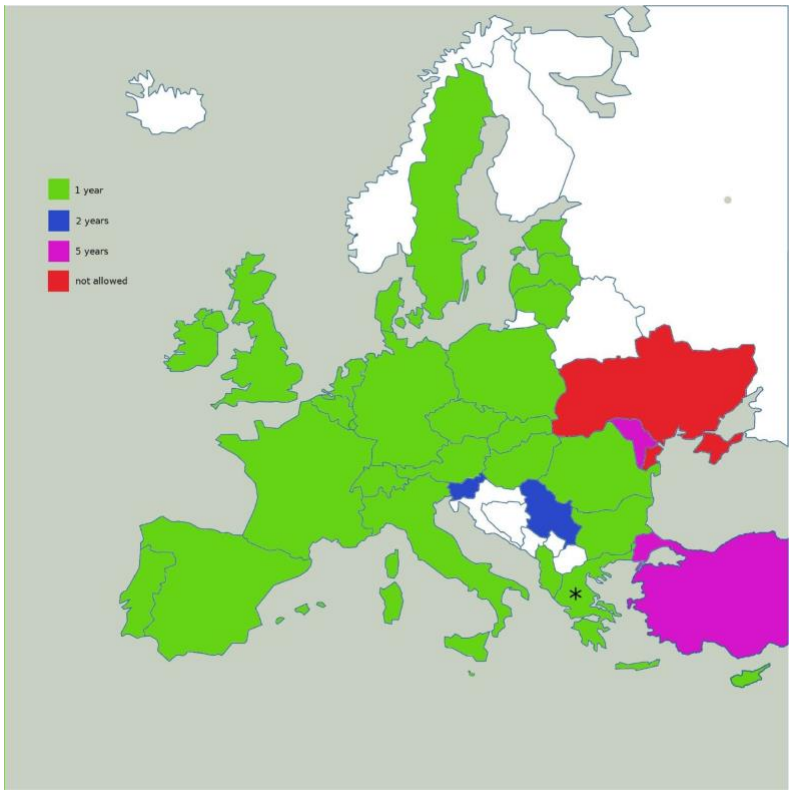
Within the global landscape of driving laws related to epilepsy, there exists cultural and societal differences in how regions legislate and enforce regulations. The following section

will compare guidelines highlighting different approaches in the attempt to find an balance between individual freedom and personal safety.

The standard across the EU is a period of driving restriction lasting one year. In the UK, guidelines are largely in line with Ireland, and individuals must be seizure-free for one year. (GOV.UK, 2023). German regulations are similar, also requiring a one-year seizure-free period, but with some flexibility offered to clinicians exercising their best judgement. The outlier in the EU is Turkey, requiring five years of seizure freedom and emblematic of a more conversative approach (Möller et al., 2023). Japan's approach is also relatively conservative and requires individuals to be seizure-free for two years before they can be considered for a driving license (Inoue, 2004).

The following figure highlights the length of time a person with epilepsy must stop driving following a seizure across Europe.

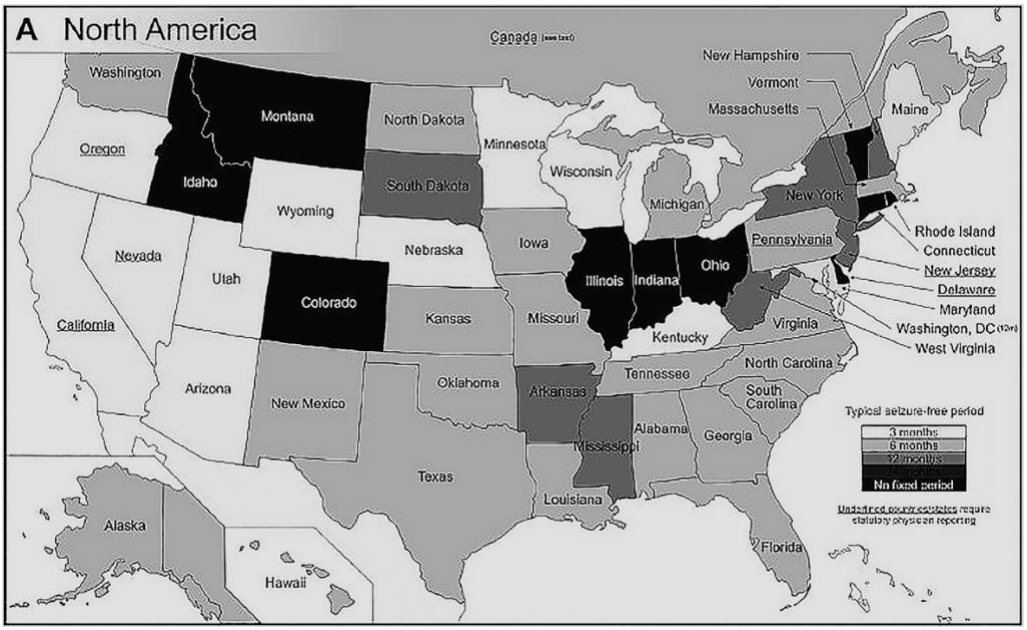
Figure II-1 . "Recommendations for Group 1 license holders (private motor cars) with epilepsy" (Möller et al., 2023)



The United States exhibits more variability as guidelines are legislated at the state level (Krauss et al., 2001). The duration of mandated driving cessation ranges from 3 months to one year and in some states, physicians are required by law to notify the local driving license authority (typically the DMV) when implementing a driving restriction due to a seizure. To highlight some interstate variability, California demands a three-month seizure-free period and requires the physician to submit a declaration on behalf of the patient. Some states, such as Colorado and Connecticut, do not mandate a fixed period. On the opposite end of the spectrum, Arkansas and Mississippi require 12 months (NREG, 2024). Although several states, including New Jersey and Pennsylvania, mandate physician reporting, an improvement in public safety in these states has not been observed and may even be counterproductive to care delivery (Lee et al., 2002).

Figure II-2: Epilepsy Related Driving Restrictions in the USA

(Joshi et al., 2019)



Although this finding may be more apparent in a global context, within the US there also appears to be a political and/or cultural divide in how driving with epilepsy is regulated. Virtually all southern states have at least a 6 month period of driving restriction with the remaining states of the former confederacy requiring 12 months of seizure freedom. For predominately right-wing political systems in power in these states, who are often thought of as prioritizing individual freedoms, their guidelines are weighted towards public safety and driving restrictions for PWE.

While all these regions share the common outlook of improving public safety through restrictions based on seizure activity, the nuances of the laws reflect cultural differences. For instance, the varying seizure-free periods required—ranging from three months in California and to two years in Japan—demonstrate different assessments of risk and different levels of emphasis on individual freedom versus public safety. Incorporating this into the broader

context, particularly within the Irish framework as previously discussed, Ireland's approach is among the median in varying international standards.

Contrasting the content of guidelines, Ireland and US have notable differences. Where the period of driving restriction in some US states is only three months, almost all states explicitly mention civil and/or criminal liability, along with the previously mentioned mandatory physician reporting. It appears the culture of driving restriction in Ireland places significant faith in the patient, with more emphasis placed on personal responsibility as opposed to potential legal consequences. Of course, Irish drivers who do not follow their physicians advice are at risk of judiciary ramifications, and several high profile cases have resulted in jail time (Healy, 2014; NicArdghail, 2018).

B. Safety Concerns and Risk Assessment

1. Reviewing evidence of the risks associated with driving and epilepsy

An important factor in determining risk is that seizures are inherently unpredictable. A feature of the condition which is relatively novel compared to other factors which might medically prohibit someone from driving such as a limb amputation, visual impairment or dementia. Therefore, a clinician determining whether a PWE may safely drive must weigh factors in the clinical history which determine seizure risk. In a metanalysis by (Berg & Shinnar, 1991), the likelihood of a second seizure in a person presenting with their first unprovoked seizure was found to be 51%.

Driving with epilepsy appears to pose significant risk, as seizures can result in sudden loss of consciousness or impaired motor control. Despite the commonly held belief that epilepsy and driving is inherently dangerous, attempts to answer this question definitively have not brought expected findings.

In a study by (Taylor et al., 1996), which utilized questionnaires to determine the relative rate of RTA's in an epilepsy population in the UK, an increase in accidents among an epilepsy cohort of 16,958 people was not observed. However, the authors did report among those who had an accident, the severity was greater with a 40% increased risk of serious injury and twofold increase in non-driver fatalities. Importantly, the authors of this paper conducted their work following a change in driving law in the UK which reduced the duration of observed seizure freedom prior to license reinstatement from two years to one.

In (Drazkowski et al., 2003), the authors again attempted to determine the relative risk of driving with a diagnosis of epilepsy. The authors performed an analysis in the three years before and after Arizona state regulations were changed from a one year driving restriction to three months. An increased rate of accidents attributed to seizures was not observed. (Sheth et al., 2004) found fatal accidents attributed to alcohol (156 times as likely) and other medical conditions such as cardiovascular disease and diabetes (26 times more likely) compared to fatalities secondary to a seizure. 0.2% of over 44,000 US road traffic fatalities listed seizure as the primary cause.

In an attempt to provide clear evidence of the risk of driving with epilepsy, (Naik et al., 2015), published a systematic review based on the American Academy of Neurology (ANN) driving guidelines. Despite the widely accepted approach that driving with epilepsy carries inherent risk, the findings of this review suggest a more nuanced situation. Of the seven studies reviewed, two exhibited a trend toward reduced rate of road traffic accidents (RTA), with a relative risk of 0.86 & 1.00 respectively. While three studies indicated an increased rate of accidents, the method of reporting accidents appears to have played a role in adequately defining the cause of accidents as the only study with statistical significance (RR of 7.01 (95% CI 2.18–26.13), was performed by reviewing emergency department records (Lings, 2001).

2. Evaluation of safety measures and risk assessment tools

An important consideration among clinicians working in epilepsy and the goal of driving restriction is to protect individual patients as well as road users. Not only do clinicians inform patients of driving restriction, but they also reinstitute driving privileges. In chapter 2, "*Neurological Disorders,"* the regulations governing driving with epilepsy are presented in detail. As highlighted, a PWE must refrain from driving for a year from the date of the last seizure. When their licence is reinstated, it must be reviewed yearly for five years. The following features are defined in the guidelines as a person having a good prognosis*: "No relevant structural abnormality of the brain on imaging, No definite epileptiform activity on EEG, Clinical evaluation of the neurologist, Seizure risk considered to be 2% or less per annum for Group 2 licensing and 20% or less per annum for ordinary driving licensing*."

Therefore, to allow patients back to driving, clinicians are advised to allow no greater than 20% per year risk of seizure for group 1 drivers or less than 2% per annum for group 2 drivers (RSA, 2022). While the percentages provided for confirming risk are firm, the data used to determine this risk is not concrete nor readily available for those clinicians tasked with interpreting and implementing the guidelines.

It is essential to understand that clinicians working in epilepsy do not have robust tools to determine seizure risk in this context, they are relying on clinical experience and reasonable judgement. Although caution is typically the mantra among doctors and nurses this may lead to a lack of uniformity among clinicians and patients. While tools to predict seizure recurrence following surgery and medication withdrawal exist, available algorithms for diagnostic use with a usable model for the purposes outlined are notably lacking (Jehi, 2021).

C. Psychological Effect

1. Impact on mental health and well-being

The impact of driving restrictions on the mental health of PWE is substantial and underrepresented within academia, particularly in Ireland. Driving symbolizes freedom, independence and self-reliance, the loss of which may trigger frustration, anxiety, and even depression (Stinchcombe et al., 2021).

Understanding the emotional toll that driving restrictions can have on the mental health of PWE is essential for developing targeted interventions that address not only the logistical challenges but also the emotional well-being of those affected (Harden et al., 2007).

The issue of driving is often the primary concern for patients' post-epilepsy diagnosis and has been identified as a barrier to employment, contributing to economic and psychological distress (Pirker et al., 2021). In (Gilliam et al., 1997), 81 consecutive patients with moderate to severe epilepsy, and frequent seizures, were asked to rank concerns by level of importance. "*Concerns about driving*" was most frequently cited (64%), followed by "*independence*" (54%), "*employment*" (36%), and "*social embarrassment*" (36%). Driving restrictions can significantly impede the mobility of individuals, particularly affecting those in rural Ireland (Gallagher et al., 2011). The psychosocial impact of these restrictions is profound; international research, to be discussed further has highlighted the correlation between driving restriction and decreased quality of life and self-esteem.

2. Social isolation and quality of life

Social isolation, regardless of whether directly causing by a driving restriction, negatively impacts quality of life and has been associated with mental health issues such as depression and anxiety, along with adverse effects on physical health (Kanbay et al., 2023).

In (Arcot Jayagopal et al., 2018), the authors performed an anonymous questionnaire among 71 PWE consisting of two main groups based at the University of Nebraska Medical Center.

Those with refractory epilepsy and those not meeting the criteria for refractory or "*ambulatory*." Quality of life was reduced in 80% and 78% of patients in each group respectively. Less than half of PWE in both groups reported the ability to access public transportation, a feature likely most notably felt within the United States where car use is ubiquitous. To prevent social isolation and maintain a degree of engagement with society, PWE are thus relying on others, with dependence for mobility noted in 90% of patients.

The ability to drive is closely tied to autonomy and social participation. When driving privileges are restricted due to epilepsy-related concerns, PWE may face challenges in maintaining social connections. Limitations on transportation options can result in reduced access to social activities, events, and interactions, increasing the risk of social isolation (Friman & Olsson, 2020).

3. Stigma and discrimination

The overwhelming majority of patients in (Arcot Jayagopal et al., 2018) felt that driving restrictions carried a social stigma. (Malik et al., 2022) found among a survey of 186 PWE that stigma and discrimination was significantly more pronounced and predicts depression, anxiety and reduced quality of life.

Stigma in epilepsy is also driven by news and popular culture. In (Nagamori et al., 2017), investigators found evidence of fluctuating stigma towards PWE over time and attributed this to media reports highlighting motor vehicle accidents secondary to seizures.

D. Studies in Ireland

Previous work highlighting this issue is not well documented. A PubMed search incorporating the terms "*epilepsy*" AND "*driving*" AND "*Ireland*" presents 42 total results. Among these, only 9 were confirmed to involve the concepts of epilepsy and driving. Among those few, only

(Sullivan & Buckley, 2013) attempted to answer this clinical question in an Irish epilepsy patient cohort. While working in the occupational health department in Limerick Hospital, the authors created an online survey for patients concerning "*community mobility, personal impact of driving cessation, previous driving practices, epilepsy and demographics*."

Patients were contacted directly from a list provided by an epilepsy charity. 95 eligible patients responded to the online 50 question survey lasting approximately 15 minutes. The researchers found that PWE with epilepsy were impacted across a host of parameters including, new transportation methods and a resulting restriction in mobility, with 88% (n=81) and 86% (n=80) reporting reduced ability to go places and increased time required respectively. Additionally, 79.6% (n=74) reported always being reliant on others for travel. 60.8% of patients reported giving up an activity with 34.1% total (53.% of males & 25.9% of females) also reporting a negative impact on romantic relationships. In this study, respondents also noted disagreements with the regulations, and bemoaned the lack of free travel provided to them during the period of restriction.

This study aimed to build on previous work both in Ireland and internationally. A review of the literature revealed a considerable gap in this issue within an Irish cohort, both in study breadth and in time since this was previously investigated. The methodology outlined in the subsequent section builds from the most effective elements of previous studies, while adapted for the Beaumont Hospital patient cohort.

III. Methodology

A. Research Questions and Objectives

1. Main research questions

The aim of this study was to examine how people with epilepsy are affected by driving restrictions. It is well documented that PWE are affected by driving restrictions, and previous work has indicated that this effect is predominately negative, therefore we aimed to investigate this in an Irish context. The leading hypotheses at the outset of this project was primary based around the idea that PWE have both a reduced quality of life secondary to driving restrictions and exhibit profound change in their behaviour during the period of restriction. We also recognised that this is underreported and underrecognized. To expand on this question, a series of research objectives were formulated.

2. Study Objectives

i. To examine the degree of personal impact on patients and their families caused by driving restrictions. This will include patients' reported impact of the restriction, perceived social stigma, potential breakdown of personal relationships.

ii. To measure quality of life using validated questionnaires and compare subgroups of patients.

iii. To examine alternative transport means utilized by patients during driving restriction including the use of public transportation and patient's family members.

iv. To explore patient's views on the potential availability of access to the Free Travel Pass scheme allowing unlimited transport use without cost not currently available for PWE.

v. To identify and compare the number of Group 1 and Group 2 drivers within the patient cohort.

vi. To identify patients working as taxi drivers, determine how they interpret the law, and how they have been affected by driving restrictions.

vii. To examine the doctor-patient relationship after the implementation of driving restriction. Specifically, patients' views on the medical staff informing them of restriction and whether second opinion and/or alternative care was sought.

B. Early Study Development & Ethics

1. Initial Conceptual Framework

The project was originally conceived in Beaumont Hospital Dublin (BH) and born out of a clinical question frequently encountered by the epilepsy staff. The research plan was created by Dr. Klaus and Prof. Delanty following meetings in BH and the RCSI. At the onset of the project, a grant proposal was submitted to the RSA to fund the salary of a full-time researcher. This grant was ultimately not awarded however the proposal laid the groundwork for both the ethics application in BH along with the M.D. proposal.

2. Grant Award from Epilepsy Ireland

After the initial study preparation, a grant application was submitted to Epilepsy Ireland and €15,000 was awarded to the research team. A small portion of the grant was used for costs including printing, and stamps. No portion of the grant was used as a salary for any researchers and the remaining funds are held in the accounts of FutureNeuro in the RCSI.

3. Ethical Approval

Ethical approval was sought from the BH ethics department and approval was granted as study 20/29. Dr. Klaus first introduced colleagues in the department through a presentation at the epilepsy journal club, a weekly meeting attended by the neurology service including NCHDs, consultants, ANPs. Staff members, including clinicians and advanced nurse practitioners (ANPs) were asked for their help in recruiting patients. Throughout the duration of the prospective recruitment, the lead co-investigator, Dr. Stephen Klaus, was working in the department as a registrar in neurology.

4. Study design

The study was designed as prospective and all patients were recruited at the time of, or soon after, the onset of driving restrictions. Interviews were initially planned to be conducted in person using hospital space however due to the Covid-19 pandemic, patients were no longer attending the hospital in person, except in emergencies, and it was quickly realized that interviews would all be conducted virtually. Due to this, consent was also obtained virtually and required either the use of email in the majority of patients, or mail in a small subset.

C. Participants

1. Inclusion and exclusion criteria

The inclusion criteria included: older that 18 years of age, having previously driven a car (either a group 1 or group 2 driver), and having received a driving restriction secondary to seizure in the past year, therefore not currently driving. There were no explicit exclusion criteria and we recruited both men and women if the inclusion criteria were met.

2. Recruitment process

The recruitment of patients through the Beaumont Hospital epilepsy cohort was straightforward in initial design. Patients would be approached during clinical counters either routinely in the outpatient's clinic or during an assessment in the epilepsy monitoring unit (EMU), the ward, or potentially in the emergency department. This included patients who presented with seizure and were planned for discharge directly home.

Staff support was requested and, in many ways, crucial for this study. The research group was not able to utilize a database for identifying patients, so recruitment was based primarily on referrals from the clinical team which included consultants, NCHD's and epilepsy ANPs. Recruitment took place in several hospital locations including the outpatient's department (OPD), the ward with inpatients, and through the nurse-led advice line. When patients were

informed of a necessary driving restriction secondary to a seizure, they were asked if they would like to participate in a research project investigating the impact that this restriction would have. Once verbal consent was obtained, the patient was approached directly by the lead co-investigator, and the patient was given a patient information leaflet and a consent form. The form was returned either in person, by post or by email and once received, an interview was scheduled.

D. Data Collection

1. Types of data

Virtually all data was generated directly from the interview. Demographic data along with a brief clinical history was recorded prior to the interview. Due to the Covid-19 pandemic, most patient interactions, beginning at the recruitment phase, were virtual and conducted by phone, without a video link. The exception were patients recruited directly from the ward or the emergency department, however this represented a minority of cases. Therefore, all patient interviews were also conducted by phone, without video. The interview lasted approximately 30 minutes and was used a standardized proforma. (See appendix) At the onset of the interview, demographic information was confirmed and included address (to determine their proximity to Dublin), current employment, marital status, and children.

2. Instruments used for assessment

The interview proforma was formatted to include three main sections, 1. Personal, 2. Societal, 3. Financial. The personal section aimed to directly look at the patient's quality of life and happiness during the period of driving restriction. This included the 16-point quality of life scale, the 4-point subjective happiness scale, and the QOLIE-10p, a modified quality of life in epilepsy score – the QOLIE-10p was added during the research period and therefore only conducted on 12 patients. (See appendix)

Subjective Happiness Scale

The Subjective Happiness Scale (SHS), created by psychologist Sonja Lyubomirsky, is a brief tool for evaluating subjective well-being. The questionnaire contains four statements that aim to measure self-perceived happiness. Participants respond to each question using a seven-point scale, where higher scores correspond to a higher degree of subjective well-being. In this study, total scores for tallied for each PWE and potentially ranged from the lowest possible score 4 to the highest of 28. The SHS's usefulness has been demonstrated across several areas of psychological research and therapeutic contexts and acts as a reliable metric for measuring well-being (Lyubomirsky & Lepper, 1999).

Quality of Life Scale

The Quality of Life Scale (QOLS), created by psychologist John Flanagan in the 1970s, represents another tool in the arsenal for researchers wanting to assess subjective well-being. The 16-point scale includes questions ranging from financial security, personal safety, quality of relationships, occupation, to more emotional or cerebral based questions including personal understanding, personal expression and intellectual development (Flanagan, 1978). Utilized in many studies, including patients with chronic illness, mental health morbidity, and among the elderly, the QOLS's validity and reliability is also well established (Burckhardt & Anderson, 2003).

QOLIE 10-P

The 2nd version of the Quality of Life in Epilepsy (QOLIE-10p) was the final validated questionnaire used in this study. It provides several measures to determine overall QOL for PWE including energy levels, mood, employment, and medication side effects. Originating from the more extensive QOLIE-31, the QOLIE-10p was chosen for this study primarily due to time constraints and the desire to not allow patients to experience fatigue during the interview. This questionnaire also contains a specific question on driving, which was particularly informative in this cohort.

Joyce Cramer is the lead developer of the QOLIE 30 and QOLIE 10p and her work has determined that the QOLIE-10p is an effective measurement tool and importantly, comparable to the longer version of the survey. In 246 patients, the authors demonstrated a high correlation between the QOLIE-10 and QOLIE-31 scores (Cramer et al., 2000).

E. Data Analysis

1. Statistical methods

The majority of data in this study is presented in descriptive terms as many responses were binary and not compared directly. To determine a statistical difference between sub-groups in the Quality of Life Scale (QOLS) and the Subjective Happiness Scale (SHS), a series of steps were undertaken.

Firstly, all data was collected on paper and then input and collated in Microsoft Excel. The data was coded and stored on a password protected computer based in the hospital in accordance with Beaumont Ethics and GDPR guidelines. The data sets was subsequently imported into RStudio and statistical calculations were performed with the appropriate R stats package. This included determining the sample size, mean and standard deviations of each group. To determine statistical power, the Cohen's d test was first performed to determine effect size and then inputted into the power calculation. The threshold for significance was considered at 0.80.

The Shapiro-Wilk test was used to determine distribution of the scores for each sub-group. In normally distributed data sets, the independent t-test was used. Groups directly compared using these methods included gender, history of previous driving restriction, access to public transport and reported negative financial impact of driving restrictions. Beyond this, the

remaining findings in this study were analysed descriptively, without additional statistical methods.

2. Qualitative analysis

In an important section of this work, a qualitative approach was utilised. The patients were invited to speak openly and the conversation was not directed in any manner beyond asking the following question: "*Can you please describe in your own words how, if at all, you or your family have been affected by the driving restriction?"* The responses were not audio recorded due to ethical concerns however notes were taken, with importance weighed on key words or phrases which were then tallied for each patient.

IV. Results

A. Demographic Characteristics of Participants

In total, 23 patients recruited from BH consented to an interview. The average age among these patients was 45.8 years. The vast majority, 21 patients, had received a one-year driving restriction, while the remaining two were under a six-month provisional restriction, awaiting further evaluation in a neurology clinic. Over 90% of the participants were Irish. In terms of driving experience, all were (Group 1) personal car drivers, including one individual who previously worked as a taxi driver, also categorized as group 1. No group 2 drivers were identified. The mean duration from the onset of the driving restriction to the time of interview was 51 days, with a range extending from 5 days to 240 days. For 11 patients, this was their first driving restriction secondary to a seizure.

Table 1. Patient Demographic and Background information

Total Number of Patients	N=23
Mean Age (y)	45.8

Gender	Female 65% / Male 34.7%
Ethnicity	Over 90% Irish
Driver License Category	All Group 1 (personal car users)
Taxi Drivers	One patient formally driving a taxi
Method of Data collection	Telephone interviews
Mean duration of restriction at interview	51 days (range 5-240d)
First time restriction from driving	11 participants

B. Effect on Quality of Life

1. Quality of Life in Epilepsy Score (QOLS)

All patient interviews included the QOLS with total scores tallied for each patient (n=23).

Figure IV-1. Comparing QOLS across patient subgroups

	Gender		Access to public transport		Negative financial impact		New diagnosis vs established epilepsy	
	Male	Female	Yes	No	Yes	No	New	Established
Total patients	8	15	19	4	14	9	7	16
Mean QOL score	85.1	81.3	80.8	91	80.7	85.6	83.9	82.1
p-value	p = 0.75		p = 0.07		p = 0.20		p = 0.71	

Although a trend was observed to higher QOL scores among patients reported no access to public transport, this finding was not significant. We observed a trend of mean lower scores among patients who reported a financial impact of driving restrictions.

2. Subjective Happiness Score (SHS)

Figure IV-2. Comparing SHS across patient subgroups

	Gender		Access to public transport		Negative financial impact		New diagnosis vs established epilepsy	
	Male	Female	Yes	No	Yes	No	New	Established
Total patients	8	15	19	4	14	9	7	17
Mean SHS score	20.4	19.5	18.9	24	18.3	21.1	20.7	19.4
p-value	p = 0.75		p = 0.11		p = 0.15		p = 0.63	

Statistical significance between subgroups was not observed and again higher mean scores were observed with patients reporting no access to public transport and lower with patient's who reported a negative financial impact.

3. QOLIE-10p

The QOLIE-10p was incorporated during the study period and was used in 12 patients. Patients in this group reported low mood between a good bit of the time and some of the time, with energy levels also within this range. Among domains potentially bothering patients, work limitations and the physical effects of antiepileptic drugs were most least impactful. Social limitations and memory were identified as more bothersome comparably. With regards to driving, patients reported that epilepsy had caused trouble either "*a great deal*" or "*a lot*."

Overall quality of life was 2.6 indicating between pretty good and good and bad about equal. However when questioned about the overall distress related their epilepsy quality of life, this was most closely aligned with "*a lot*."

Table 2. A summary of the findings of the QOLIE-10p

Total number of patients	N=12
Energy levels	3.7 (mean scores – range 1-5)
Feeling downhearted and low	3.9
Driving Impact	1.3
Bothered by: Work Limitations	2.2
Social Limitations	3.0
Memory difficulty	3.0
Physical effect of medication	2.1
Psychological effect of medication	2.5
Fear of seizure (in the next 4 weeks)	2.5
Overall Quality of Life	2.6
Distress secondary to QOL	3.7
Most important factor (ranked)	Overall quality of life (9 of 12 patients)
Least important factor (ranked)	Worry about seizure (4 of 12 patients)

- Lower scores indicate more concern or increased frequency of listed impacts

C. Social Impact

1. Impact of Driving Restrictions on Daily Life

When examining primary reasons for travel, 44% required transport for work-related purposes, with the other group of 44% cited personal reasons. Driving primarily for one's

children was reported by 13%. With regards to access to public transportation, 17% reported no access, 57% had access with limitations, and 26% reported being able to reliably use public transport. During the period of driving restriction, personal car use, while being driven by someone else, remained the primary mode of transportation for 61% of the cohort. Public transportation was used regularly by only 17% of the participants. Other modes of transportation less utilized included walking and taxis, with 9% of the patients, and cycling, at 4%.

Figure IV-1: Primary Reason Reported for Use of Transport

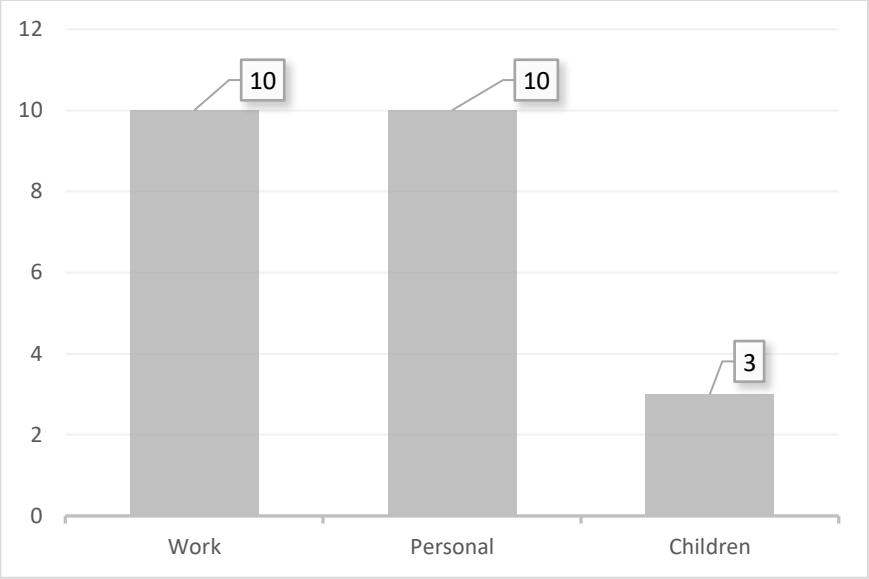


Figure IV-2: Patient Reported Access to Public Transport

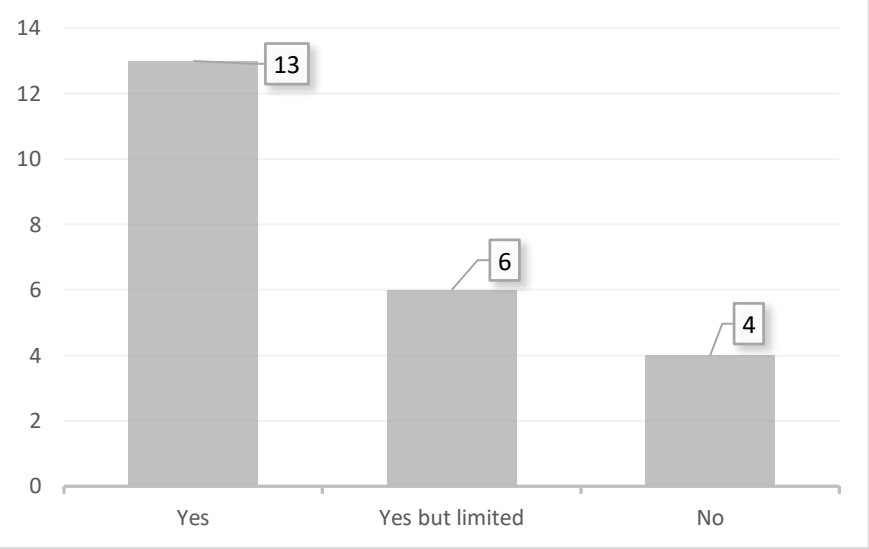


Figure IV-3: Primary Method of Transport Prior to Onset of Driving Restriction

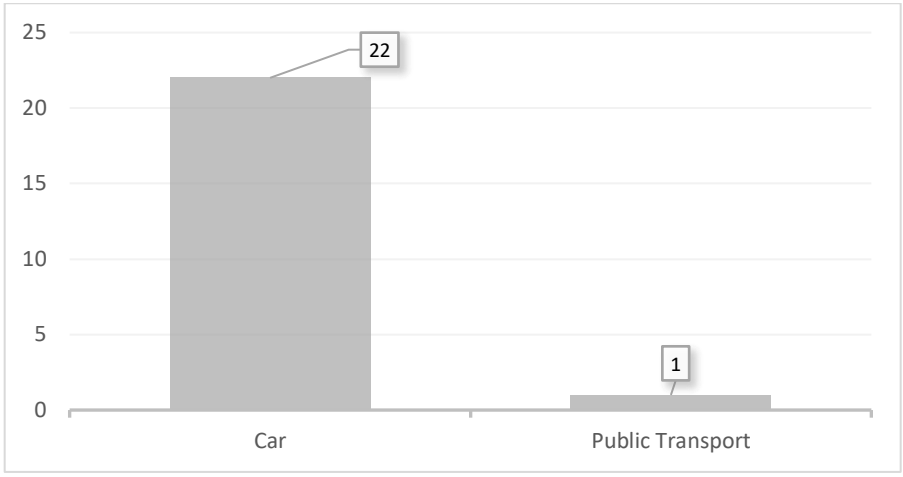
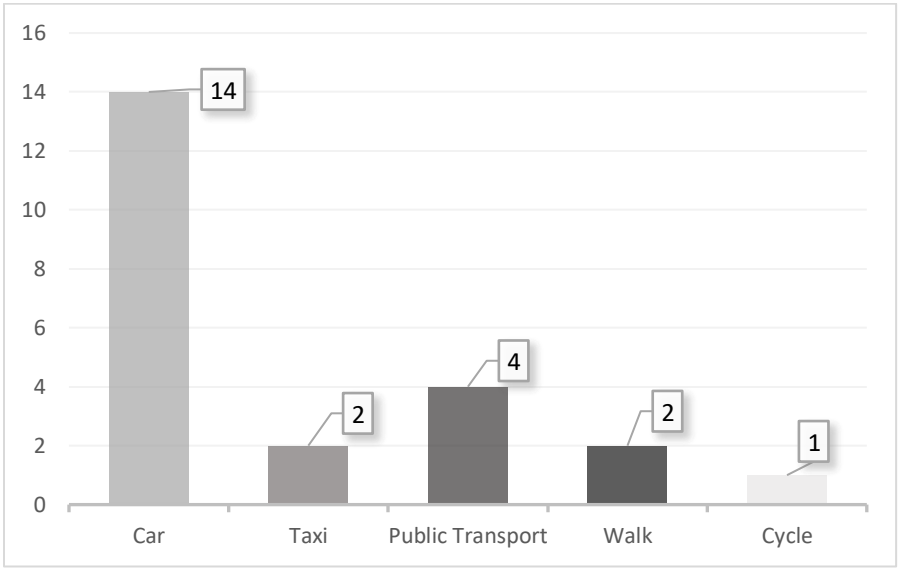


Figure IV-4: Method of Transport During Driving Restriction

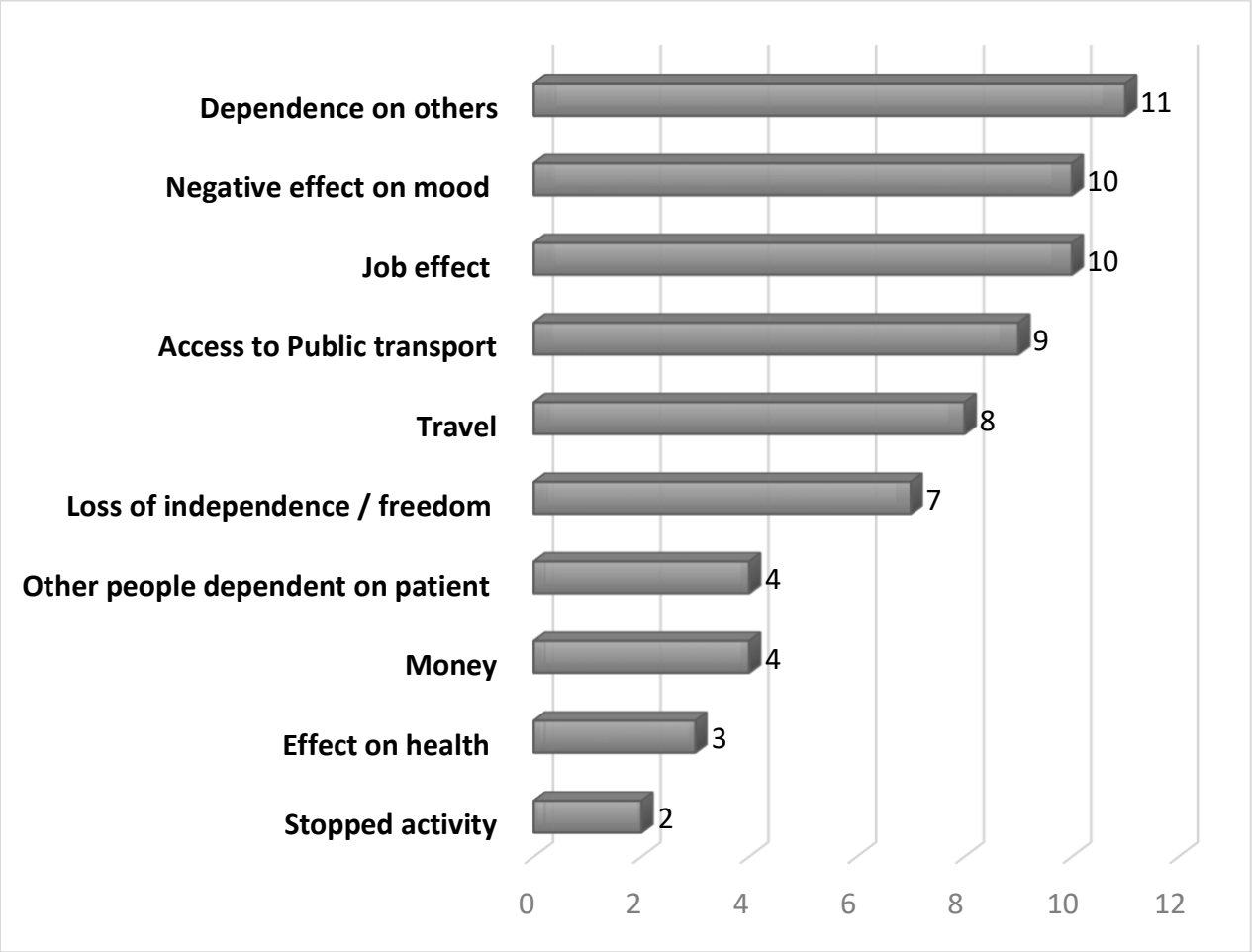


- Y-axis is number of patients in figures IV 1-4.

2. Patient led interview Section

In the patient-led interview section of the study, the patient was invited to engage in open discourse about the effects of driving restrictions on their lives. The most frequently mentioned words or phrases were *"dependence on others",* "*negative effect on mood,"* "*job effect*," and the lack of "*access to public transportation*."

Figure IV-5: Self-Described impact of driving restrictions (frequency of word / phrase usage)



3. Changes in behaviour during driving restriction

When asked about driving during the period of restriction, 9% (n=2), reported instances of driving acknowledging they had not followed their clinicians advice nor adhered to the law. Both of these patients reported a single instance and were adamant that they were now obeying the driving restriction. When queried about the impact of driving restrictions on the doctor-patient relationship, a majority of 74% (n=17) perceived no change in their relationship with their healthcare provider. However, 17% (n=4) reported a negative effect, and a minority of 9% (n=2) experienced a positive impact on the doctor-patient relationship because of the driving restriction discussions. Only one patient, representing 4%, sought a second medical

opinion from another neurologist. This patient confirmed that on discussion with another clinician, there was not a change made to their planned driving restriction of one year.

4. Free Travel

Patients were asked two questions in regard to free travel. Do they currently have a free travel pass? And do they believe they would benefit from free travel? The majority of patients, 75%, were not previously awarded a free travel pass, with 70% of patients reported that they would benefit from one.

Figure IV-6: Summary of Changes in Behaviour

	Yes	**No**
Currently hold free travel pass?	6 (25%)	17 (75%)
Would benefit from free travel?	16 (70%)	7 (30%)
Negative impact on doctor-patient relationship?	4 (17%)	19 (83%)
Driving during period of restriction	2 (9%)	21 (91%)

D. Financial Impact

61% (n=14) of patients reported a negative financial impact due to the driving restrictions. Additionally, 35% (n=8) of the patients reported that alternative travel options were financially restrictive, often due to the increased reliance and cost of public transportation and taxis, particularly when public transport services were insufficient. 17% (n=4) of the

patients experienced job loss due to lack of the ability to drive. Among patients who were willing to quantify financial loss, the mean reported decrease in income was €162.50 per month with a range of €20 to €600 per month.

Figure IV-7. Rate of Patient Reported Negative Financial Impact

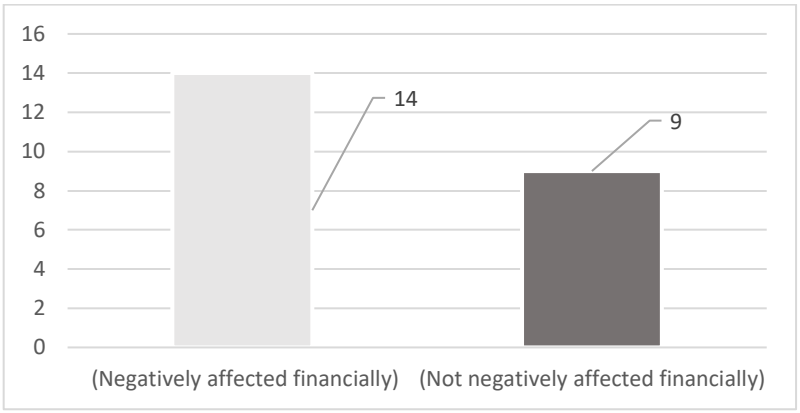


Figure IV-8. Rate of Patient Reported Cost Limitations of Travel During Driving Restrictions

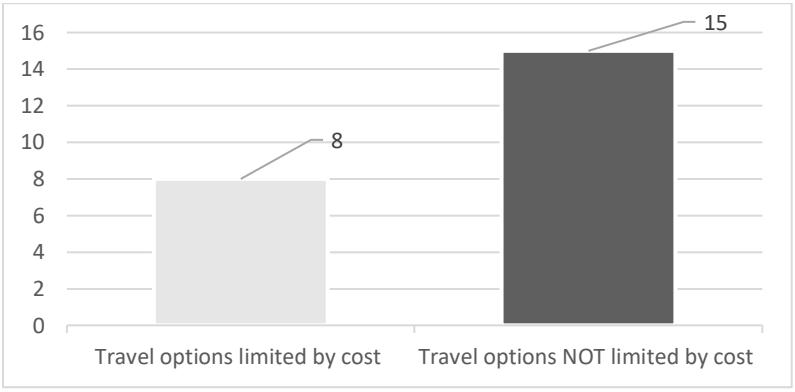
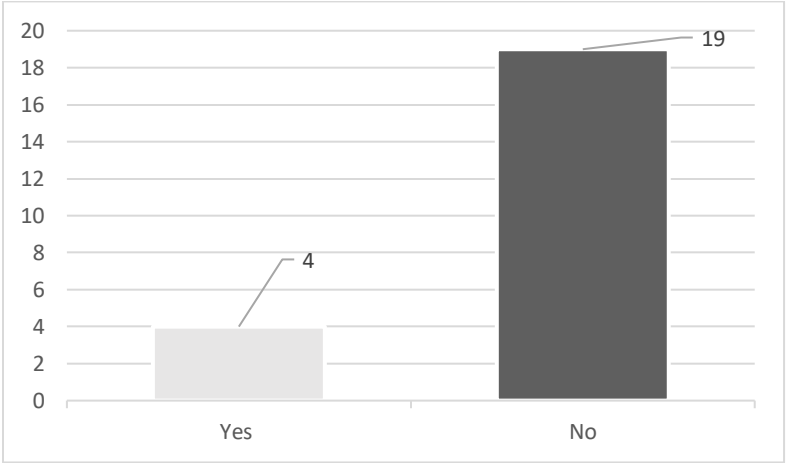


Figure IV-9. Rate of Patient Reported Loss of Employment Secondary to Driving Restrictions



V. Discussion

A. Interpretation of Results

1. Patient Demographics

The study's demographic of 23 middle-aged, predominantly Irish patients, has revealed important findings in an adult epilepsy population across many parameters. The mean age of 45.8 years indicates that this cohort were well into adulthood with professional and personal responsibilities including homeownership, career development and child rearing. The inability to drive has clearly not only affected mobility but created a major disruption to their lives and those around them.

An initial objective at the onset of this study was to determine the rate of Group 1 and Group 2 drivers among the epilepsy population cohort. Unfortunately, no Group 2 drivers were recruited during the study. In fact, as far as the lead researchers are aware, no patients restricted from driving during the study were forced to give up a Group 2 licence, perhaps an

indication of the rarity of the circumstances. Therefore, it was impossible to determine how many Group 2 drivers were attending the BH epilepsy service and unfortunately left a stated goal at the onset of this study unanswered. Our research team was historically aware of one patient, prior to the onset of the study, who had returned to driving professional after a 5 year restriction, and there were reportedly several others. However this information is not routinely recorded and therefore the rate of professional drivers with epilepsy is not known.

Similarly, an accurate assessment of the number of taxi drivers in the Beaumont Hospital cohort was not possible. Currently, a license to drive a taxi is considered a Group 1 licence and their licensure is the responsibility of An Garda Síochána (the police). Although we had one patient present as a taxi driver, he was subject to the standard one-year driving restriction, and clearly lost his primary form of employment, however plans to return to driving and operating a taxi was not explored further. It should be noted that specific criteria for taxi drivers within the guidelines is sparce.

Approximately half of patients, (n=11) received a driving restriction for the first time, with the other half having already experienced at least of year of the inability to drive. It was hypothesized that those who had been repeatedly subjected to driving restrictions may have exhibited lower QOLS or SHS score due to the persistent disruption to their transport options and the fact that this cohort clearly suffered from repeated seizures, however this finding was not observed.

2. Quality of Life and Subjective Happiness Scores

While significance was not observed in the analysis of subgroups, the trends in reported negative financial impact may have been more pronounced with a larger sample size. A lower mean SHS score in patients reporting access to public transport was the opposite of the expected finding. This may be explained by the small sample, a feature of this group not

related to public transport access, or simply a non-significant finding. Again in the QOLS, a trend towards a lower mean score with patients reporting a negative financial impact was also observed potentially indicating a relationship.

While statistical differences were not observed between the sub-groups, the tools proved to be usable and accessible in this population, even though they were conducted over the phone. From a proof of concept perspective to continue this work, the scales were valuable. Further analysis with a larger sample size may also allow for analysis of individual subsets of the scales in more detail.

The QOLIE-10p also proved to be a useful metric in this cohort. It was easily conducted over the phone and did not add more than 2-3 minutes to the total interview time. Importantly, and not surprisingly, the lowest scores were noted when discussed the impact of driving, validating that this cohort were all impacted by driving restrictions.

3. Societal, Healthcare and Policy Implications

This study gleaned some important and previously highlighted societal data on Irish PWE including their primary mode of transport, the dependence on others and their access and use of public transport options. While perhaps not a surprising finding, our patients were overwhelming car users who relied on motor vehicle transport for life engagement.

A clearly underrepresented group of individuals in Ireland are the friends and families of PWE who are now tasked with providing transport. This was previously not identified amongst an Irish cohort and may warrant policy discussion regarding a carer's or transport allowance for these individuals.

Importantly, two patients in this group reported driving during the restriction. One patient reported that this was a necessity due to their children requiring transport, adding to the

dangers associated with driving and seizure and highlighting that PWE may increase risk for not only themselves and other road users, but also passengers in their own vehicle.

Although a small relative number of people reported driving, it is felt that this is underrepresented. Any amount of driving during restriction accentuates the need for continued education for PWE and public health campaigns reminding people of their personal responsibility. That being said, PWE, like others who do not have the right to drive a car legally, will continue to drive, even with the potential for severe repercussions however the governing and policing of roads is beyond the scope of this study.

Despite some in our cohort reporting driving during the period of restriction, this is low when compared to existing literature. For instance, (Sullivan & Buckley, 2013) found that 22.1% of patients drove illegally and (Arcot Jayagopal et al., 2018), reported 34% of patients. The method of data collection likely explains this finding as both of the above mentioned studies used an anonymous questionnaire. Our interview strategy, employing individual one-to-one interviews with a member of the clinical team, almost certainly led to reduced reporting.

The desire for one patient to seek a second opinion can be explained through two avenues. Firstly, this patient may have had a poor experience with their clinician, either through the manner of how the driving restriction was delivered, a disagreement on the interpretation of the law, or potentially exacerbating a previously unresolved rift present in the relationship. In a public hospital like BH, patients are often seen by a different clinician at each appointment, and due to the large and ever expanding cohort of PWE attending the hospital, individual attention and time for exhibiting the appropriate level of empathy is not always realised. Secondly, the patient in this case sought a second opinion with the expectation of a different outcome regarding their driving restriction. Thankfully, and importantly, the duration of driving restriction was not adjusted, potentially indicating a consensus among clinicians.

Although a small proportion of patients reported a negative impact on the doctor-patient relationship, the majority reported no change and/or a positive impact. This is important finding and likely indicates that doctors are delivering driving restrictions well, that patients understand the law and do not consider this a personal affront. Despite receiving bad news, PWE are willing to continue with their current clinician service and trust they can best manage their epilepsy. Additionally, it may also indicate patient's respect for physicians as messengers of driving related guidelines, and not directly imposing a driving restriction.

4. Patient-led Interview Section

The findings in this section were consistent with previously studies and showed that without prompting, patients will return to the most frequently encountered obstacles including dependence on others, effect on employment, negative effect on mood and the lack of suitable public transportation.

5. Considerations for Future Work

Balancing public safety concerns with the rights of PWE remains an ongoing debate. The need for continued research, public education, and advocacy efforts are essential to ensure that driving restrictions align with current medical knowledge and promote inclusion.

Attending a public health care setting in Ireland is fraught with unique challenges. Firstly, access remains an ongoing issue, with persistent crises in terms of bed numbers and those awaiting hospital admission, surgery, and lifesaving treatments. Due to the demand on epilepsy services in Beaumont Hospital, appointments are separated by a minimum of 6 months. The rotating nature of junior doctor training also directly impacts continuity of care. The lack of a personalised nature to healthcare delivery likely has a negative impact on

patients, and may prevent understanding of their diagnosis, medication regimens, and importantly for this study, how to correctly interpret driving guidelines.

An effort to create informed and reasonable driving guidelines is clear when examining the Irish epilepsy landscape. The working group tasked with writing and updating guidelines is filled with experts in their field including neurologists, epileptologists, public health specialists and policy makers. Ongoing research in this field is presented yearly at the Traffic Medicine Webinar, where Dr. Klaus has had the pleasure of presenting on two occasions, and frequently invites speakers from both Ireland and internationally.

Where patients in Ireland are located likely has an impact and how driving restrictions are received and followed. Ireland has a significant rural population, where public transport is virtually non-existent or extremely difficult to access, particularly for someone who may not be able to walk long distances. Several patients in this study, when asked about access to public transport, reported yes but limited however added that this meant walking 20 minutes down a narrow road without a footpath to a bus stop. This is a quite subjective reporting of access to public transport and for many PWE, this would likely mean not being able to leave the house via bus or train.

Anecdotally, it has been discussed among clinicians that those living in rural communities are so dependent on personal car use, they may not adhere to driving restrictions compared to those with at least some alternative means of transport. A potential direction for further study would be to conduct interviews with patients based out of a rural hospital, such as Limerick, and compare findings with a Dublin based population.

The work of patient advocacy groups can influence the experiences of PWE. At the onset of this study it was envisioned that data from this work would contribute to EI's lobbying of government officials to allow for free travel. We specifically asked questions on the use of and

potential benefit of free travel at the recommendation of EI. An exciting piece of news to emerge at the conclusion of this study is that the government in Ireland has recently announced that PWE who have been restricted from driving will be eligible for free travel. This was formally announced in May 2024 by the Minister of Social Protection, Heather Humphreys and Peter Murphy, the CEO of Epilepsy Ireland. The ongoing work in St. James's Hospital aims to interview the first patients who may have availed of this new provision.

Another related avenue of research in this field is looking at the impact of staff working in epilepsy and how they are affected by the implementation of driving restrictions. A potential question set for this cohort may include determining knowledge of driving restrictions and where to find the guidelines, comfort around implementing driving restrictions and experiences with disruption in the doctor-patient relationship. It is foreseen that this work will be carried out in St. James's Hospital within the next year.

B. Limitations of the Study

1. Sample Size

This study aimed to enrol 50 participants however several factors prevented this goal. The COVID-19 pandemic was particularly poor timing in this regard. The lack of face-to-face interaction reduced patient encounters substantially. Furthermore, a necessary increased work load required of clinicians essentially eliminated all time for academic pursuits beyond direct clinical responsibilities.

Although the cohort of patients attending Beaumont is large, the single centre recruitment contains bias as patients in Ireland typically attend a particular hospital based on their address or catchment. While this group likely accurately represents North Dublin, with both city and rural living people, it did not provide a representation of those living in true rural Ireland.

2. Selection Bias

The study design created inherent bias which was appreciated in several ways. Only patients who were initially contacted by another member of the team were invited to participate. This required a high level of engagement from other staff working in the epilepsy department. In an environment with frequent turnover and a subset of doctors only working in the department at 3-4 month intervals, it was impossible to keep all staff actively engaged in recruitment. Therefore, many patients were likely missed during the recruitment period.

Additionally, only patients who were willing to engage were interviewed and those people may have been motivated to participate because they were particularly aggrieved with their current driving situation. Finally, patients during the Covid-19 pandemic were predominantly contacted virtually, and consent forms were returned via email, or in rare cases through the post. Elderly patients, who were required to complete a consent and return it in a timely manner, also were likely prevented from taking part.

The research was also conducted while the lead co-investigator, Dr. Klaus, was a member of the Beaumont Hospital neurology team. Career advancement and contract necessities dictated that the time of employment in Beaumont was not able to continue beyond a specific time frame. In addition, the fact that the interviewer was also part of the clinical team created a potential conflict of interest which may have been felt by some patients. They may have been more likely to report a negative impact, and less likely to report driving during restriction. Furthermore, some patients likely did not want to participate because they were worried about having to report driving, and that this would have a negative impact on their ability to receive care through the hospital.

3. Statistical Power

The ability to effectively compare mean scores in the subgroups was limited by sample size. In a power calculation performed with the following parameters, effect size: 0.276, number of each group 12, and a level of significance of 0.05, the power is 0.099. In other words, the chance of a type II error is large, and conclusions drawn from this should be considered in this context. To appropriately compare sub-groups in the manner described above with statistical significance, we would need approximately 200 patients in each group. Therefore, the effectiveness of these scales used in further studies will be used in two scenarios. One, as a tool measuring subjective changes longitudinally, or two, comparing healthy controls.

VI. Conclusion

This work has been initiated at St. James's Hospital and remains active. The patient recruitment strategy has evolved: individuals are now directly approached at the clinic and provided with preliminary consent by the clinical staff. This method aims to streamline the recruitment process and enhance patient participation rates.

As described above, patients will now be directly asked about free travel including whether they have heard about this new policy development and whether they plan to request a free travel pass. This will be the first study group from which we have obtained this information and will provide important data to EI as well as government. The hope is that the majority of patients will report that they will avail of free travel when it becomes available, and inform government that this policy is well received and useful for PWE.

The nature of data collection in this study had clear advantages and limitations. Without an interview section with open ended responses, an important aspect of this study would have been lost. Particularly as patients appeared to benefit from the opportunity to share their qualms to a listening audience without interruption. An obvious limitation, and one almost

certainly underreported, is the response regarding driving during the period of restriction. As compared to international work, we found a markedly low number of patients reporting driving during restriction, a future study utilising anonymous online questionnaires would likely reveal a more accurate reflection of adherence.

Overall, the impact of driving restrictions in people with epilepsy is substantial and Irish patients remain underrepresented in international literature. We hope the publication of these findings, together with data from the St. James's Hospital cohort, will make an important contribution to the field.

A. Closing Remarks

Thank you for taking the time to read and engage with this work. I hope that I was able to provide important context for the development of driving restrictions for people with epilepsy, and medical fitness to drive generally, and to help understand how driving, law, autonomy, and the ability to interact with society and health are inexorably linked.

My sincere thanks must also be again sent to my colleagues working in Beaumont Hospital, without you this project would never have been possible.

Driving and epilepsy is a topic I have grown sincerely fond of since I first envisioned this project and I plan to continue this work throughout my career. I look forward to your feedback and recommendations on how I can continue this most effectively.

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Appendix

A. Interview Proforma

Confidential Patient Information
(If found please contact Dr. Stephen Klaus, Beaumont Hospital)
Stephenklaus@stjames.ie

Interview Proforma **Date: _____**

Examining the Personal, Societal and Financial Impact of Driving Restriction on Epilepsy Patients

Patient Number for coding:

Interview site: Beaumont Hospital / SVUH / SJH / Phone / Other: _____

Interviewer: Stephen Klaus

Date of Driving Restriction: _____

Initial planned duration: _____

Duration thus far: _____

1st driving restriction: Yes / No / Not sure

Reason: (circle)

1st seizure

OR

Established diagnosis of epilepsy or person with epilepsy PWE

OR

Awaiting consultant review

Do you currently or have you ever driven professionally?

Part One: Personal

1.1. Subjective Happiness Scale:

1. In general, I consider myself:

   1 2 3 4 5 6 7

   (Not a very happy person) (A very happy person)

2. Compared with most of my peers, I consider myself:

   1 2 3 4 5 6 7

   (Less happy) (More happy)

3. Some people are generally very happy. They enjoy life regardless of what is going on, getting the most out of everything. To what extent does this characterization describe you?

   1 2 3 4 5 6 7

   (Not at all) (A great deal)

4. Some people are generally not very happy. Although they are not depressed, they never seem as happy as they might be. To what extent does this characterization describe you?

   1 2 3 4 5 6 7

   (Not at all) (A great deal)

   - Question 4 is counted opposite – (7=1 and 1=7)

   Total Score:

1.2. Quality of Life Scale (QOLS)

1	2	3	4	5	6	7
Terrible	**Unhappy**	**Mostly dissatisfied**	**Mixed**	**Mostly satisfied**	**Pleased**	**Delighted**

1. Material well-being and financial security?
2. Healthy and personal safety?
3. Relationships with parents siblings and other relatives
4. Having and raising children
5. Relationship with spouse / significant other
6. Relationships with friends
7. Activities related to helping or encouraging others
8. Activities related to local or national government
9. Intellectual development
10. Personal understanding
11. Occupational role
12. Creativity and personal expression
13. Socializing
14. Passive and observational recreational activities
15. Active and participatory recreational activities
16. Independence

1	2	3	4	5	6	7
Terrible	**Unhappy**	**Mostly dissatisfied**	**Mixed**	**Mostly satisfied**	**Pleased**	**Delighted**

Total Score:

1.3. Can you please describe in your own words how, if at all, you or your family have been affected by the driving restriction?

1.4. Has the relationship with your doctor been affected, either positively or negatively?

1.5. Have you considered getting a second opinion or attended another service?

1.6. Have you driven during the period of driving restriction?

Part Two: Societal Impact

2.1. Use of transport

(a) Primary Transport before Driving restriction: (circle)

Personal Car / Taxi / Public Transport / Bicycle / Walk

(b) Primary Transport Post-driving restriction: (circle)

Personal Car (family / friends) / Taxi / Public Transport / Bicycle / Walk

Is public transport accessible to you? (circle)

Yes / Yes but limited / No

If not, why? _____

(c) Primary Transport Use

Work / Personal (errands etc.) / Parents / children / Extended family

(d) Estimated cost per month for transportation

(e) Is this more OR less than when you were driving?

(f) Have you ever had a free travel pass awarded to you?

If yes: Over 65 / Disability / Other

(g) Would you benefit from a Free Travel Pass?

Yes / No / Not sure

(h) Are your transportation options currently limited by cost?

Yes / No / Not sure

Part Three: Financial Impact

(a) Have you been affected financially by the driving restriction?

(b) Were you forced to give up your job?

(c) Did you lose your primary source of income?

(d) Are you the sole earner in your household?

(e) Did you insurance premiums increase?

(f) Can you estimate financial loss?

Thank you for your time

B. Scales and questionnaires

1. Quality of Life Scale (QOLS)

QUALITY OF LIFE SCALE (QOL)

Please read each item and circle the number that best describes how satisfied you are at this time. Please answer each item even if you do not currently participate in an activity or have a relationship. You can be satisfied or dissatisfied with not doing the activity or having the relationship.

	Delighted	Pleased	Mostly Satisfied	Mixed	Mostly Dissatisfied	Unhappy	Terrible
1. Material comforts home, food, conveniences, financial security	7	6	5	4	3	2	1
2. Health - being physically fit and vigorous	7	6	5	4	3	2	1
3. Relationships with parents, siblings & other relatives- communicating, visiting, helping	7	6	5	4	3	2	1
4. Having and rearing children	7	6	5	4	3	2	1
5. Close relationships with spouse or significant other	7	6	5	4	3	2	1
6. Close friends	7	6	5	4	3	2	1
7. Helping and encouraging others, volunteering, giving advice	7	6	5	4	3	2	1
8. Participating in organizations and public affairs	7	6	5	4	3	2	1
9. Learning- attending school, improving understanding, getting additional knowledge	7	6	5	4	3	2	1
10. Understanding yourself - knowing your assets and limitations - knowing what life is about	7	6	5	4	3	2	1
11. Work - job or in home	7	6	5	4	3	2	1
12. Expressing yourself creatively	7	6	5	4	3	2	1
13. Socializing - meeting other people, doing things, parties, etc	7	6	5	4	3	2	1
14. Reading, listening to music, or observing entertainment	7	6	5	4	3	2	1
15. Participating in active recreation	7	6	5	4	3	2	1
16. Independence, doing for yourself	7	6	5	4	3	2	1

2. Subjective Happiness Scale

For each of the following statements and/or questions, please circle the point on the scale that you feel is most appropriate in describing you.

1. In general, I consider myself:
not a very happy person 1 2 3 4 5 6 7 a very happy person

2. Compared with most of my peers, I consider myself:
less happy 1 2 3 4 5 6 7 more happy

3. Some people are generally very happy. They enjoy life regardless of what is going on, getting the most out of everything. To what extent does this characterization describe you?
not at all 1 2 3 4 5 6 7 a great deal

4. Some people are generally not very happy. Although they are not depressed, they never seem as happy as they might be. To what extent does this characterization describe you?
not at all 1 2 3 4 5 6 7 a great deal

3. QOLIE-10p

Patient Weighted Quality Of Life In Epilepsy:
QOLIE-10-P (Version 2.0, US English)

Patient's Name:	Today's Date:
	⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋ D M Y

If you experienced a simple or complex partial seizure within the previous four hours, or a generalized tonic-clonic seizure within the previous 24 hours, please delay completing this questionnaire

INSTRUCTIONS:

This questionnaire asks about your health and daily activities. **Answer each question** by circling the appropriate number (1, 2, 3…).

If you are unsure about how to answer a question, please give the best answer you can and write a comment or explanation in the margin. Please feel free to ask someone to help you if you have difficulty reading or completing the form.

Part A.

These questions are about how you have been FEELING during the past 4 weeks. For each question, please give the one answer that comes closest to the way you have been feeling.

How much of the time during the past 4 weeks…

(Circle one number on each line)

	All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	None of the time
1. Did you have a lot of energy?	**1**	**2**	**3**	**4**	**5**	**6**
2. Have you felt downhearted and low?	**1**	**2**	**3**	**4**	**5**	**6**

How much of the time during the past 4 weeks your epilepsy or antiepileptic drugs have caused trouble with…

(Circle one number)

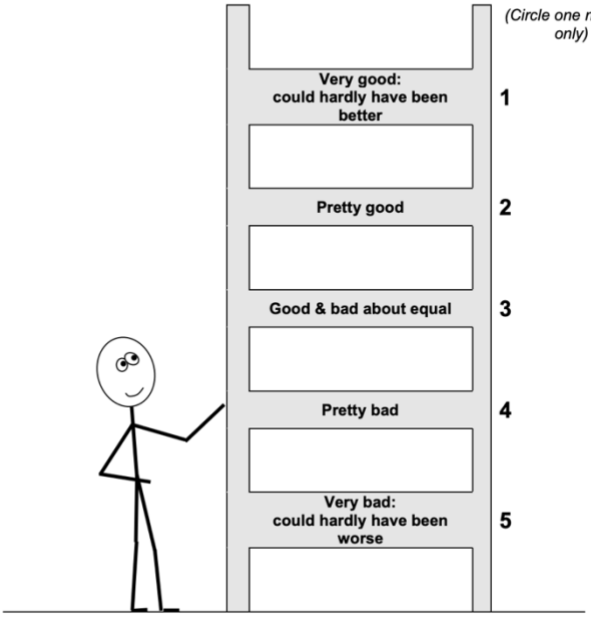
	A great deal	A lot	Somewhat	Only a little	Not at all
3. Driving (or other transportation)	1	2	3	4	5

During the past 4 weeks…

	Not at all bothersome				Extremely bothersome
4. How much do your work limitations bother you?	1	2	3	4	5
5. How much do your social limitations bother you?	1	2	3	4	5
6. How much do your memory difficulties bother you?	1	2	3	4	5
7. How much do physical effects of antiepileptic drugs bother you?	1	2	3	4	5
8. How much do psychological effects of antiepileptic drugs bother you?	1	2	3	4	5

	Very afraid	Somewhat afraid	Not very afraid	Not afraid at all
9. How afraid are you of having a seizure during the next 4 weeks?	1	2	3	4

10. How has your **QUALITY OF LIFE** been during the **past 4 weeks** (that is, how have things been going for you)?



Part B.

*Reviewing all the questions you have answered in Part A, consider the overall impact of these problems on your quality of life **in the past 4 weeks.***

(Circle one number)

	Not at all	Somewhat	Moderately	A lot	Very much
11. How much does the state of your epilepsy-related quality of life **distress** you overall?	1	2	3	4	5

Part C.

*Considering **ALL** the questions you have answered, please **indicate the areas** related to your epilepsy that are most **IMPORTANT** to you **NOW.***

12. *Number the following topics from '1' to '7' with '1' corresponding to the most important topic and '7' to the least important one. Please use each number only once.*

___ **A.** Energy (tiredness)

___ **B.** Emotions (mood)

___ **C.** Daily activities (work, driving, social)

___ **D.** Mental activity (thinking, concentrating, memory)

___ **E.** Medication effects (physical, mental)

___ **F.** Worry about fits (impact of fits)

___ **G.** Overall quality of life

C. Driving Regulation and Medical Documentation in Ireland

Neurological Disorders	Group 1 - Entitlement ODL car, motorcycle and tractor	Group 2 Entitlement ODL
Epilepsy[49-54] Epileptic attacks are the most frequent medical cause of collapse at the wheel. **N.B.** If within a 24 hour period more than one epileptic attack occurs, these are treated as a "single event" for the purpose of applying the epilepsy standards. Epilepsy includes all events: major, minor and auras.	**The epilepsy standards apply*** **Not permitted to drive following diagnosis.** Standards require a driver to remain seizure-free for 1 year for a 1-year licence to be issued and to remain seizure-free, with medication as indicated, with further 1-year licences if continuing seizure-free for 5 years with annual review: following this a longer duration licence may be issued by the NDLS if continuing seizure-free and if there is no other relevant medical condition. Driver should notify NDLS.	**The epilepsy standards apply*** **Not permitted to drive following diagnosis.** Standards require a driver to remain seizure-free for 10 years since the last attack without antiepileptic medication. Permitted to drive subsequently provided the driver is: ■ Without anti-epileptic medication for the required period of seizure freedom. ■ Has completed an appropriate medical follow-up. ■ After extensive neurological investigation, has no relevant cerebral pathology established and there is no epileptiform activity on the electroencephalogram (EEG). Driver should notify NDLS.

First unprovoked seizure	**Not permitted to drive initially.** Permitted to drive subsequently 6 months from the date of the seizure unless there are clinical factors or investigation results which, in the opinion of the treating consultant suggest an unacceptably high risk of a further seizure, i.e. 20% or greater per annum. Driver should notify NDLS.	**Not permitted to drive initially.** Permitted to drive subsequently, 5 years from the date of the seizure, provided the licence holder has undergone recent assessment by a neurologist and there are no clinical factors or investigation results (e.g. EEG, brain scan) which indicate that the risk of a further seizure is greater than 2% per annum. They should have taken no antiepileptic medication throughout the 5 year period immediately prior to the granting of the licence. Driver should notify NDLS. If risk of further seizure is greater than 2% per annum Group 2 epilepsy standards apply.

The following features are consistent with a person having a good prognosis:

- No relevant structural abnormality of the brain on imaging;
- No definite epileptiform activity on EEG;
- Clinical evaluation of the neurologist;
- Seizure risk considered to be 2% or less per annum for Group 2 licensing and 20% or less per annum for ordinary driving licensing.

Driving Licence Medical Report Form

NDLS
National Driver Licence Service

Part 1 to be completed by applicant (applicant must sign part 1 in the presence of the Medical Practitioner)

1. Driver Information:

Applicant Name:

PPSN

Date of birth
Day Month Year

Driver number
(if available)

a) My application is for a driving licence/learner permit as a driver of a (see page 2 for vehicle categories). **Group 1** Yes ☐ No ☐

Group 2 Yes ☐ No ☐

b) Has your most recent licence/permit been revoked or have you been advised by a medical professional to cease driving for a period? Yes ☐ No ☐

If yes state reason _____

c) Have you ever had an **epileptic seizure**? Yes ☐ No ☐

If yes give the date of your last seizure ____ / ____ / _____

Unless your case meets the exceptional case criteria allowed for **Group 1 drivers only you must by law be 12 months seizure free** before you can drive/return to driving. (See Part 2 for epilepsy exceptional case criteria)

I declare that to the best of my knowledge the above information is true and I have made the doctor completing this medical report form required under the Road Traffic Acts aware of any medical conditions, drugs and medications that I use.

Signature of applicant _____ Date: ____ / ____ / _____

Part 2 to be completed by a Medical Practitioner on the Irish Medical Council Register (Specialist or General)

1. Applicant name _____ **DOB** ____ / ____ / _____ **meets the relevant medical fitness standard for:**

a) **Group 1 vehicles** Yes ☐ No ☐ for a period of 1 yr ☐ 3 yrs ☐ 10 yrs ☐

b) **Group 2 vehicles** Yes ☐ No ☐ for a period of 1 yr ☐ 3 yrs ☐ 5 yrs ☐

c) The applicant needs to wear corrective lenses while driving Yes ☐ No ☐

d) The applicant has a physical disability requiring adaptations on vehicle to drive Yes ☐ No ☐

e) The applicant has a limb prosthesis/orthesis Yes ☐ No ☐

f) Does the applicant suffer from epilepsy. (If yes please see 2.2a exceptional case criteria overleaf) Yes ☐ No ☐

g) Does the applicant require restrictions to be applied to his / her driving licence / learner permit (Please see overleaf 2.2b) Yes ☐ No ☐

Signature of Medical Practitioner _____ Date: ____ / ____ / _____

Note: This form must be submitted to the NDLS within one month of this date

Stamp of Medical Practitioner whose name is on the Irish Medical Council Register

Medical Practitioner telephone number:
(Specialist or General)

Irish Medical Council Registration Number

January 2022

PART 2 CONTINUED NEXT PAGE

Driving Licence Medical Report Form

Part 2 (continued) to be completed by Medical Practitioner

2.Special licence requirements including exception cases for epilepsy

a)**Epilepsy:** If this does not apply mark - Not Applicable ☐

If your patient has had an epileptic seizure within the last 12 months,
have they been declared fit to drive a group 1 vehicle (See below for vehicle categories)
by a consultant neurologist under the exceptional case criteria for epilepsy shown below: Yes ☐ No ☐

Exceptional case criteria include: First seizure; provoked seizure only in preceding year; seizure not affecting consciousness or driving ability; seizure in preceding year only on medically supervised withdrawal of antiepileptic medication; or seizure exclusively while asleep and the first such sleep seizure was a minimum of 12 months previous

b) **Restricted licence recommendation** If this does not apply mark - Not Applicable ☐

limited to day-time driving (one hour after sunrise and one hour before sunset) Yes ☐ No ☐

limited to journeys within a radius of 30 km from holder's place of residence. Yes ☐ No ☐

limited to journeys with a speed not greater than 80 km/h Yes ☐ No ☐

Signature of Medical Practitioner _____ Date: _____ / _____ / _____

Note: This form must be submitted to the NDLS within one month of this date

Vehicles are classed as Group 1 and Group 2. If you are applying for a vehicle in both Groups, please tick Group 1 and 2. Where an applicant meets the medical criteria for Group 2 vehicles, they will automatically meet the criteria for Group 1 vehicles

Group 1 Vehicles and Licence Category	Group 2 Vehicles and Licence Category
AM	C
A	C1
A1	CE
A2	C1E
B	D
BE	D1
W	DE
	D1E

Making an application for a learner permit or driving licence? Apply online now at ndls.ie

There is no need for you to complete paper forms, make appointments or visit an NDLS centre in person. All you need is your Public Service Card and your verified MyGovID for secure access to an online application at ndls.ie

Your medical report form can be uploaded when you apply online or can be posted after you make your application.

EXPLANATORY NOTES

1. To complete your medical examination you must go to your doctor, have your medical examination and sign this form in the presence of the doctor. When the form is completed by your doctor you must submit it to the National Driver Licence Service with your learner permit/driving licence application **within one month of the date of the medical examination.**
2. For medical fitness standards, vehicles are classed as being in Group 1 or Group 2. This table describes which vehicles are in Group 1 and in Group 2. Further information on each licence category can be found online at ndls.ie and on the licence application form. A higher standard of medical fitness is required of those drivers who hold licences for Group 2 vehicles. Please note that Group standards apply to all categories of vehicles within that Group. Individual categories should not be marked on the table above.
3. A person driving a Group 2 category vehicle must be certified as medically fit at least every five years.
4. Applicants over 75 years of age can only be certified as being fit to drive for either one or three years.
5. Where appropriate the doctor may engage the services of other medical and driving professionals (e.g. consultant, occupational therapist, optometrist, on-road driving assessor) to inform their completion of this form.
6. Please have your Doctor initial any alteration or change made in completing this form. This is important in assessing the validity of the document presented.
7. **For more information on medical fitness standards see Medical Fitness to Drive Guidelines on www.ndls.ie.**