Impact of Changes in Burden of Proof on Recorded Rate of Suicide in Ireland

Report

Submitted to

HUGG

Prepared by

Indecon International Research Economists

Indecon

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Under Irish law, the standard of proof required to return a verdict of suicide by a coroner is 'beyond reasonable doubt'. This report considers the potential impacts of changing the burden of proof for a legal determination of death by suicide in Ireland on the number of suicides reported. It was conducted by Indecon Economic Consultants on behalf of HUGG (Healing Untold Grief Groups) as part of Indecon's *pro bono* programme of work.

The Issue

Under Irish law, the standard of proof required to return a verdict of suicide by a coroner is 'beyond reasonable doubt'. In the UK, the standard of proof was lowered in 2018 and is based on a balance of probabilities. The 'beyond reasonable doubt' burden of proof to determine suicide arguably impacts numerous items in the nexus of data and prevention. Besides likely reducing the overall estimated number of suicides, it may shift the focus of risk factors, the order of importance of mortality among groups (e.g., young males' preventable accidental death), widen the confidence interval of prediction, or slow the rate of recognising official statistics and trends. The use of the 'beyond reasonable doubt' standard can be linked to the previous criminalisation of suicide. The act of suicide was decriminalised in Ireland in 1993, though the standard in Ireland used by coroners to determine cause of death has not.

Studies on Suicide Classification

It is important to consider the comparison between the various other empirical studies and our results. While very few previous studies exist in the area, England, Wales, and Canada recently changed their burdens, but clear impacts or trends do not emerge. A number in countries such as the UK, Australia, New Zealand, Canada and the USA considered trade-offs and policy implications of suicide determinations. The focus of a significant body of work focused on drug poisoning, but these studies only shed light on the difficulties of classification and policy implications and did not estimate any impact of the change per se. In Ireland, the IPSDS found about 31% of probable suicide deaths did not satisfy the beyond a reasonable doubt standard.

Indecon's Findings

This report provides estimates of the potential impact of a change in the burden of proof empirically using a difference-in-difference (DiD) approach which exploits the quasi-experimental nature of the change in policy in England and Wales from 'beyond reasonable doubt' to 'balance of probability' versus Ireland, where no such change occurred.

While we used a range of data and estimates, central estimates using aggregate rates were that there was a change of 2-2.5 deaths classified as suicides per 100k population as a result of the change in the burden of proof in England and Wales. Given rates of about 10-12 in England and Wales, these estimates suggest a 20-25% increase in the number of reported suicides, which, given about 500 deaths per year in Ireland, would be about 100-125 suicide deaths increase by change in the classification. This is consistent with the findings of the IPSDS reported above.

1 Introduction

1.1 Introduction

This report considers the potential impacts of changing the burden of proof for a legal determination of death by suicide in Ireland. It was conducted by Indecon Economic Consultants on behalf of HUGG (Healing Untold Grief Groups) as part of Indecon's *pro bono* programme of work.

1.2 About HUGG

HUGG is an Irish-registered charity whose vision is to provide hope and healing for anyone bereaved by suicide. They do this by:

- Providing information, telephone support and local peer support groups led by volunteers with lived experience.
- Engaging with suicide research, to better inform public policy and improve bereavement services.
- Collaborating with professionals and organisations in the bereavement sector to advance best practice.
- Raising public awareness about suicide bereavement and be a voice for those bereaved by suicide.
- Advocating for change in how state institutions engage and support with those bereaved by suicide.

This report reviews origins of the burden of proof standard, considers evidence and pathways of impact, and then estimates the potential impact empirically using a difference-in-difference (DiD) approach which exploits the quasi-experimental nature of the change in policy in England and Wales versus Ireland.

1.3 Background and Context

The burden of proof to determine suicide arguably impacts numerous items in the nexus of data and prevention. Besides likely reducing the overall estimated number of suicides, it may shift the focus of risk factors, the order of importance of mortality among groups (e.g., young males' preventable accidental death), widen the confidence interval of prediction, or slow the rate of recognising official statistics and trends.

The nature of the burden-of-proof standard as an issue in suicide prevention and policy is complex, but the potential negative impacts of underestimating suicides, in aggregate or for particular sub-populations, are significant. Suicide awareness and prevention groups have highlighted this issue. For example, Samaritans state, "Trustworthy data about suicide is essential for understanding the scale of suicide, identifying those most at risk and evaluating the effectiveness of interventions to prevent suicide."[1] They list as an action point, "Revision to standard of proof used by coroners in the Republic of Ireland to 'the balance of probabilities'."

[1] Samaritans (2023), "Understanding Suicide Statistics for the UK and Republic of Ireland", page 10.

Overly high burdens of proof can result in the number of suicides being underestimated, reducing the accuracy of suicide statistics. In the UK, the standard of proof required for a suicide conclusion is 'the balance of probabilities', whereas in the Republic of Ireland it is 'beyond reasonable doubt'.[2] Besides the differences in the standard of proof for a coroner, there are also differences in the reporting official statistics of suicide between the UK nations and Ireland.

The burden-of-proof differences across countries also impacts difficulty of international comparisons. A very general problem exists in determining suicide versus accidental/unintentional death, but legal differences between countries make comparisons more challenging. Nonetheless, OECD countries such as Ireland, Australia, New Zealand, Canada, and the USA, share English common law principles of jurisprudence for burden of proof, namely, the civil standard (preponderance of the evidence) or criminal standard (beyond a reasonable doubt). The beyond-a-reasonable-doubt standard has its origins in legal doctrine related to criminal law, and that suicide, was considered (in the past) to be a form of self-homicide. Moreover, legal doctrine is intertwined with religious and moral-philosophical doctrine which previously created the beyond-a-reasonable-doubt standard.

Currently, Ireland and New Zealand retain the beyond-a-reasonable-doubt standard, while Australia, Canada and the USA maintain a preponderance-of-the-evidence standard. Canada changed their standard in 2009 from the criminal standard to the civil standard. England and Wales recently changed their standard by way of Maughn (2018); Maughn subsequently applied throughout the UK.

Charitable organisations such as HUGG, Samaritans, and others have been advocating for a lowering of the burden of proof to preponderance of the evidence. A proposition of charitable agencies and stakeholders is that lowering the burden of proof in Ireland would have a positive policy benefit to raise 'official' rate in a country and focus policy and minds and funding, and further promote better comparability of data across countries, better comparability over time within the country (e.g., potentially reducing lags to obtain official counts), and thus have a positive impact overall on reducing suicide rates. While this is a debate *per se*, it is notable that research suggests universal/broad-based national campaigns on awareness and prevention have been successful in reducing suicide rates.[3]

Nonetheless, the implications in costs and benefits of a change in the burden of proof should be considered carefully. Families of the deceased and insurance providers may have competing economic interests in the burden-of-proof standard which applies, while aspects of grief and bereavement may be exacerbated by one verdict versus another (e.g., intentional vs. accidental).

Given the importance of suicide globally and in Ireland; the differences across countries and the policy levers of the burden of proof; and the potential trade-offs and different interests/points of view in adapting one burden vs another, it is important to conduct careful study of the problem and use any existing evidence or comparisons across countries to inform decisions. Difficulty in making policy-relevant conclusions and interpreting statistics across time and space requires careful use of non-experimental and/or quasi-experimental econometric methods. While this paper is far from a full cost-benefit analysis, the main purpose is to review and understand the antecedents of the standard and then empirically estimate the potential impacts of a change.

A key aspect of the paper is to exploit the change in the burden of proof from the criminal to civil standard in England and Wales while no change occurred in Ireland.[4] This represents a classic set-up

[2] *Op Cit,* page 11.

[3] Ishimo M-C, et al. (2021), "Universal interventions for suicide prevention in high-income Organisation for Economic Co-operation and Development (OECD) member countries: a systematic review" *Injury Prevention* ;**27**:184–193. doi:10.1136/injuryprev-2020-043975

[4] We also compare to NI using the same method, but NI-RoI did not satisfy the parallel trends assumption.

of the difference-in-differences (DiD) model. The method is used where one group or area receives a 'treatment' (policy change), while the other does not (no policy change). If the assumptions of the model are met, most importantly parallel trends (the time trends in outcomes must be similar before the policy), then causal inference can be made.

We use both aggregate suicide registrations/rate data by sex and year, and data classified by ICD category by age, sex, and year, and consider the estimated impacts of the policy change on both deaths and undetermined causes. Data were obtained from public national statistical agencies.

1.4 Structure of this Report

The remainder of the paper is organised as follows:

- Section 2 provides some international comparisons on suicide rates;
- Section 3 sets out the legal and historical origins of the 'beyond reasonable doubt' standard;
- Section 4 reviews reports which study the impact of different classifications of suicide deaths;
- Section 5 presents the econometric analysis; while
- Section 6 provides a discussion of the conclusions of the report.

1.5 Acknowledgements

Indecon would like to acknowledge the co-operation, assistance and inputs provided by a number of people in completing this study. In particular, we would like to thank Fiona Tuomey of HUGG, and Eve Griffin; Paul Corcoran; and Prof Ella Arensman (National Suicide Research Foundation). **The usual disclaimer applies and the analysis and findings in this independent report are the sole responsibility of Indecon.**

2 Background & Context

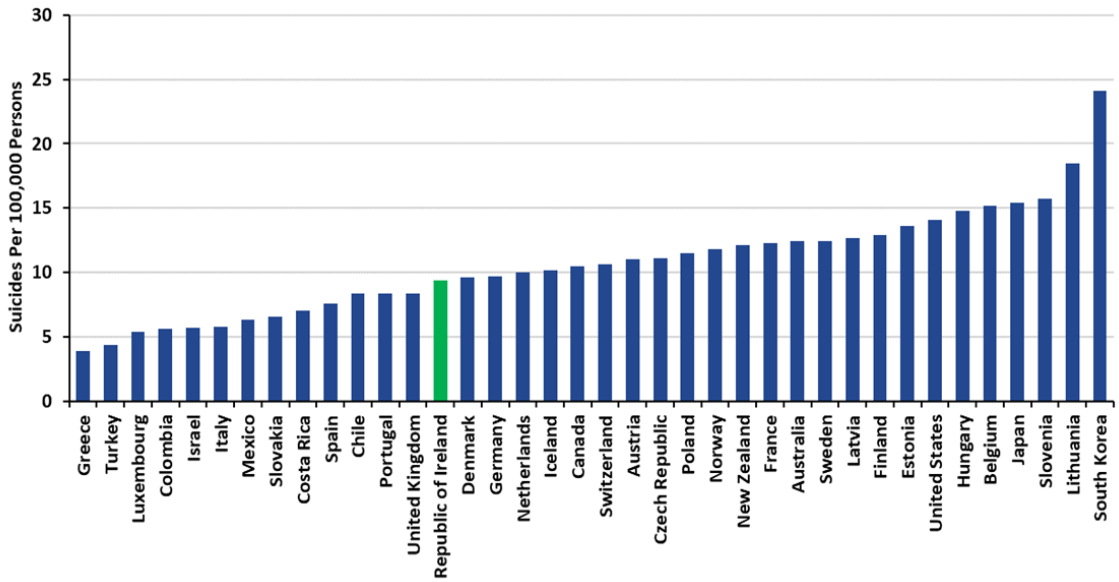
2.1 Introduction

This section presents some background on the rate of suicide in total in Ireland relative to international peers.

2.2 Suicide Rates Internationally

Suicide is a significant and important social and mental health and social issue across the globe. According to the World Health Organization (WHO), over 700,000 suicides occur annually in the world.[5] Besides the scale of suicide, impacts differ among groups, with a higher prevalence among lower income groups and countries, males, and young adult age groups. In OECD countries, suicide represented 1% of all-cause mortality in 2021. The next graph shows the overall rate of suicide per 100,000 persons, and shows that Ireland's rate is close to international averages. Moreover, Ireland's rate is well below the rates of the highest countries, which are over 15% Lithuania and South Korea, while still well about the lowest countries Greece and Turkey, which are below 5%. Ireland's rate is just above the UKs.

Figure 2.1: Overall Rate of Suicide per 100,000 Persons



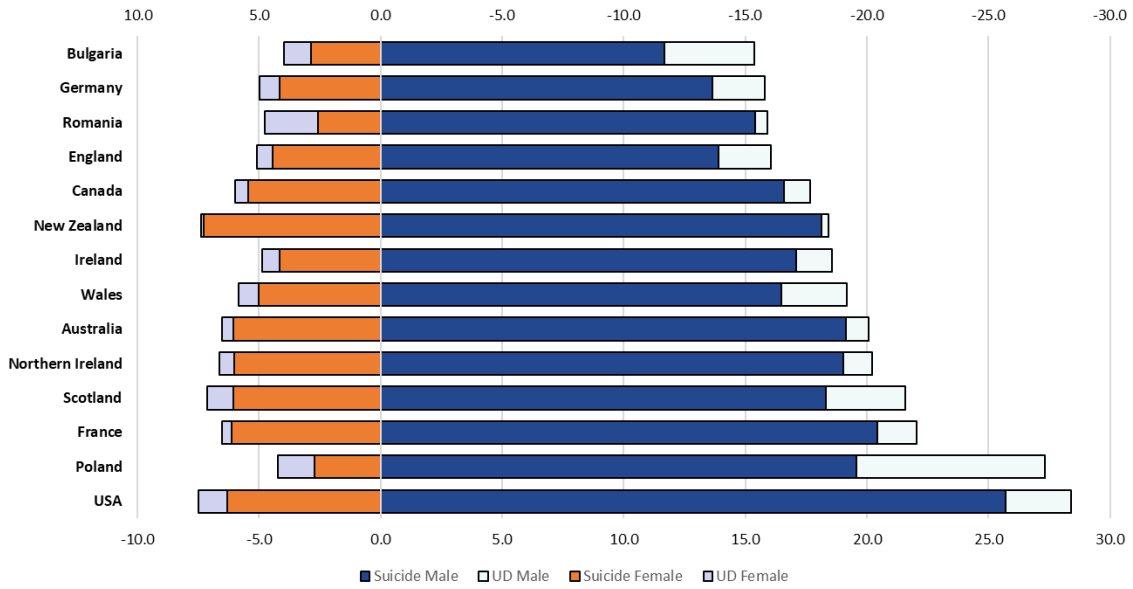
Source: OECD

There are stark contrasts in suicide rates by gender, with males universally having circa double the rates compared to women. These rates are again influenced by age. In Ireland, suicide represents

[5] See https://www.who.int/news-room/fact-sheets/detail/suicide.

nearly half (43%) of the deaths for young males 20-24 in 2020.[6] Besides these rates, there appear to be country specific effects of high death rates. It is also believed that there may be trade-offs between undetermined deaths and suicides. An analysis of this data for selected OECD countries is found below. Based on the graphic below, for example, Poland might have a trade-off for males, while the evidence for the USA and Ireland looks more ambiguous.

Figure 2.2: Suicide and Unexplained Deaths by Gender

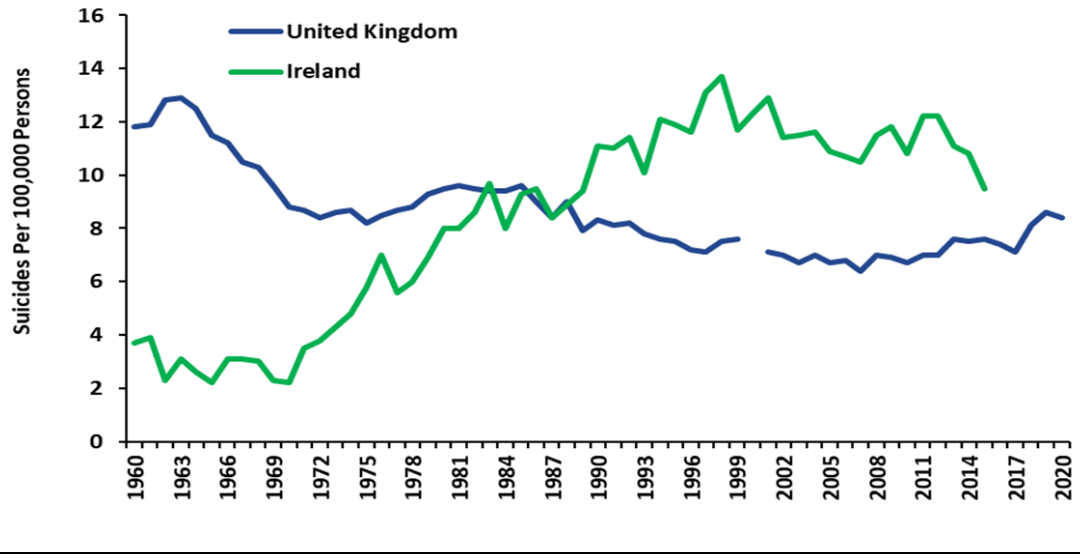


Source: Various

International comparisons can also be made over time, though are subject to changes in how data is collected and other factors. Ireland's suicide rates have increased from 3.7 per 100k persons in 1960 to 9.4 per 100k in 2018. The UK has seen a relative decline in suicide rates.

[6] Irish Times, https://www.irishtimes.com/ireland/social-affairs/2023/11/14/suicide-most-common-cause-of-death-among-people-aged-15-to-34/ "Seán O'Connor, "There were 74 deaths of males aged 20 to 24 years in 2020, and 43.2 per cent of these were due to suicide. This was the highest proportion of deaths due to suicide by age cohort for males."

Figure 2.3: Irish and UK Suicide Rates – 1960-2020



Source: Indecon

2.3 Discussion

While suicide deaths overall may seem small relative to certain mortality causes such as cancer and heart disease, a suicide is often perceived as a wholly preventable death, and the impacts are often greater when using other metrics such as total life years lost, since suicide impacts among certain groups such as young people, who are less likely to have other significant co-morbidities. Considering subgroups of the population which are not likely to experience mortality associated with old age and major diseases (e.g., cancer, heart disease), gives a starker picture. In Ireland, suicide is one of the most common causes of death for people aged 15-34.

Besides the various social and economic costs, suicide's impact on society is perhaps easily undervalued due to mental health and other impacts on the bereaved. Half of adults in Ireland have known someone who has died by suicide and 13% have experienced the loss of someone close to them.[7] Furthermore, almost half of those who participated in our survey had experienced multiple losses to suicide. Generally speaking, those closest to the person who has died will experience the most profound impacts, as evidenced in this report, with two-thirds of participants reporting to have lost a family member.

While prevention of any major mental health and social issue such as suicide is challenging, evidence suggests a variety of approaches can have significant impacts. Extensive literature exists, but a variety of types of interventions are known, such as national awareness campaigns. Large (2018) [8] reviews

[7] O'Connell S, Tuomey F, O'Brien C, Daly C, Ruane-McAteer E, Khan A, McDonnell L, Arensman E, Andriessen K, Grennan A, Griffin E (2022). AfterWords: A survey of people bereaved by suicide in Ireland. Cork and Dublin: National Suicide Research Foundation and HUGG.

[8] Large MM. The role of prediction in suicide prevention. Dialogues Clin Neurosci. 2018 Sep;20(3):197-205. doi: 10.31887/DCNS.2018.20.3/mlarge. PMID: 30581289; PMCID: PMC6296389.

the literature and classifies interventions by the scale of intervention group, but importantly considers risk factors. Large (2018) usefully classifies interventions as "universal" (targeting whole populations), "selective" (targeting higher-risk groups), and "indicated" (protecting individuals).[9] Large (2018) discusses various issues with the different approaches and some key conclusions on improving prevention include identifying risk-factors, problems with underestimating deaths, and 'false positives' in prediction.

[9] Large MM. The role of prediction in suicide prevention. Dialogues Clin Neurosci. 2018 Sep;20(3):197-205. doi: 10.31887/DCNS.2018.20.3/mlarge. PMID: 30581289; PMCID: PMC6296389. ; page 1.

3 Legal Review

3.1 Introduction

Debating the policy of a burden-of-proof standard for suicide requires an understanding of the origins and evolution of the standard. The beyond-a-reasonable-doubt standard for suicide has its roots in criminal law. A brief review of why suicide was considered a crime *and* the basis of the standard of proof is thus needed.

3.2 Pre-Modern Origin of Burden of Proof

Rooney (2023) reviews the origins of the legal doctrine for Britain (including Ireland)[10] and finds that suicide was considered a crime as early as the 13th Century—the idea being that suicide was against God/religious beliefs but also against the King, to whom the person was a subject. An additional key fact was that a felon in medieval Britain, upon conviction, would have all his property including his land confiscated by the King, while someone who died by suicide would only have goods and property confiscated. This led to the circumstance that if sentenced to death for say, murder, one could avoid having their land also confiscated via suicide. Kings and Lords recognising this perverse incentive, and potential loss of confiscated land, naturally changed the law.

Besides the economic incentives of confiscation, for the poor with no assets or land, ecclesiastical and social 'honour/dishonour' incentives were strong in the Middle Ages. It was not until 1823 that the "Burial of Suicide act forbade the practice of burying those who had committed suicide at a crossroads with a stake through their heart."[11] Curiously, Rooney (2023) reviews that in the mid-19th Century, that difference between the legal and religious beliefs (since the act changed the law but beliefs still remained) led Coroners and juries to typically determine suicide to be the result of temporary insanity. This led to the vast underestimation of the number of suicide deaths versus deaths by self-inflicted harm due to temporary insanity, with Rooney (2023) citing "…Dr Strahan noting that it was impossible that 98% of successful suicides were ruled temporarily insane, while only 4% of attempts at suicide were deemed to be so."[12] This is perhaps the earliest reference where public health practitioners were raising questions about the burden of proof and standards to determine suicide and its impact on statistics.

Clear articulation of the principle in English law is most commonly attributed to Blackstone and his 10:1 principle stating, "It is better that ten guilty persons escape than that one innocent suffer ", *Commentaries on the Laws of England* (1760s).[13] *Commentaries* goes into details comparing practices of trial by ordeal or battle versus juries and illustrating some of the preposterous implications such as in some capital cases, where only a "miracle" would allow for acquittal.[14]

There is debate as to whether the standard of beyond a reasonable doubt was to the better protection of king or commoner, with the interaction of ecclesiastical versus civil obligation also being

[10] https://theucdlawreview.com/2023/04/01/grave-consequences-the-societal-rationale-behind-the-medicalisation-and-secularisation-of-suicide-as-reflected-in-the-burial-of-those-who-died-by-suicide-in-ireland-and-england-in-the-19th-centu/.
[11] Op cit,
[12] Op Cit, Rooney (2023), citing, SAK Strahan, 'Suicide and Insanity: A Physiological and Sociological Study' (1894) 40 Journal of Mental Science 433, pg 436.
[13] https://en.wikisource.org/wiki/Commentaries_on_the_Laws_of_England
[14] Blackstone, Commentaries, (PUBLIC WRONGS. BOOK IV. Ch. 27); available at

the crux of the matter, for jurors had both a civil duty and a religious duty not to convict an innocent person. As Whiteman writes, “the Juryman who finds any other person guilty, is liable to the Vengeance of God upon his Family and Trade, Body and Soul, in this world and that to come." and "[i]n every case of doubt, where one's salvation is in peril, one must always take the safer way…”[15] Whiteman argues it was in reaction to these religious fears that "reasonable doubt" was introduced in the late 18th century to English common law, thereby allowing jurors to convict more easily. Therefore, the original use of the "reasonable doubt" standard was opposite to its modern use of limiting a juror's ability to convict.”

3.3 Modern Law

The World Health Organisation’s (WHO) International Classification of Diseases, Injuries, and Causes of Death (ICD) is used in most countries, including Ireland, to classify cause of death on official death certificates.[16] The WHO ICD standard for classification of suicide is:

> “For the act of killing oneself to be classed as suicide, it must be deliberately initiated and performed by the person concerned in the full knowledge, or expectation, of its fatal outcome.”[17]

It follows that some evidence of the state of mind of the deceased must indicate both their initiation and awareness, of the fatal outcome of their at. The standard of proof in Ireland for this evidence has historically been “beyond a reasonable doubt”. The same standard of proof had been used in England and Wales until recently, when common law changed it to “preponderance of the evidence” (or more likely than not).

The legal standard of proof for making a finding of suicide appears to be rooted in the fact that historically, suicide was considered a criminal act in many countries. These laws have widely been repealed over the past century, and today, suicide remains a criminal act under the law in fewer than 20 countries. Most of these are in Africa, Asia, and the Middle East.[18]

Developments of the law underpinning the standard of proof for Ireland and other countries are discussed below.

3.4 Ireland

The Coroners Act

The Coroners Act 1962 (Rev 2022) governs the classification and reporting of all deaths, regardless of cause. Any deaths which are unexpected, or the result of unnatural causes must be subject to a coroner’s inquest:

> “17. Subject to the provisions of this Act, where a coroner is informed that the body of a deceased person is lying within his district, it shall be the duty of the coroner to hold an

[15] James Q. Whitman, “What Are the Origins of Reasonable Doubt?”, History News Network, George Mason University, February 25, 2008.
[16] Corcoran, P., and Aernsman, E., (2010), “A Study of the Irish System of Recording Suicide Deaths”, accessed on 3.1.24 at https://nsrf.ie/wp-content/uploads/journals/10/IrishSystem_RecordingSuicideDeaths.pdf
[17] World Health Organisation, 1998, “Primary Prevention of mental, neurological, and psychosocial disorders”, Geneva. Accessed on 3.1.2024 at: https://iris.who.int/bitstream/handle/10665/42043/924154516X_eng.pdf?sequence=1
[18] See https://www.theguardian.com/global-development/2021/sep/09/suicide-still-treated-as-a-in-at-least-20-countries-report-finds; https://time.com/6290858/malaysia-suicide-decriminalization-mental-health/

> inquest in relation to the death of that person if he is of opinion that the death may have occurred in a violent or unnatural manner, or unexpectedly and from unknown causes or in a place or in circumstances which, under provisions in that behalf contained in any other enactment, require that an inquest should be held."

The purpose of an inquest is as follows:

> "18A. (1) The purpose of an inquest shall be to establish— (a) the identity of the person in relation to whose death the inquest is being held, (b) how, when and where the death occurred, and (c) to the extent that the coroner holding the inquest considers it necessary, the circumstances in which the death occurred, and to make findings in respect of those matters (in this Act referred to as 'findings') and return a verdict."

The Coroners Act does not define the level of proof or enumerate the evidence required for a classification of suicide, but leaves it to the coroner and/or a jury to make that determination. It is important to note that suicide, along with homicide, was also classified as a criminal offense under Irish law until the 1993 Amendment to the Coroners Act was passed.[19] Additionally, the standard of proof in any civil proceeding in Ireland is "on balance of probabilities". Thus, the prosecution of a defendant on trial for murder or manslaughter would be required to prove culpability beyond a reasonable doubt, while the plaintiff in a civil trial for medical negligence would be required to prove liability on balance of probabilities, i.e., more likely than not.

Central Statistics Office

The classification of suicide also impacts the Central Statistics Office. In most inquest cases, the CSO issues a Form 104 to the Divisional Inspector of the Gardaí where the death occurred. This process is initiated when there is not enough information on the Coroners Certificate to assign a cause of death code.[20] The form is completed by the Garda who attended the scene of death, indicating additional information regarding facts and circumstances of the scene, including the Garda's own opinion as to whether the death was the result of an accident, homicide, suicide, or undetermined.[21] This information is taken into account when the CSO assigns a statistical code to the death, which is based on the WHO ICD guidelines briefly described above.[22]

Department of Justice, Equality, and Law Reform

In 2000, the Department of Justice, Equality, and Law Reform published a Working Group Review of the Coroner Service.[23] The review encompassed all aspects of the service, so its findings and recommendations are not limited to the specific category of suicides; however, overarching principles and legal issues are applicable to suicides as well as other causes of death. Three key areas for reform identified by the Working Group are: legal, support services, and service delivery restructuring. Our discussion here is limited to the legal issues.

The following overall legal issues noted in the report are:

- Lack of codification of statutory and common law governing the coroner service;
- Inadequacies in the Act re specification of coroner procedures;

[19] Coroners Act, 1962 (irishstatutebook.ie)

[20] CSO Background Notes to Suicide Statistics, 2020, accessed on 3.1.24 at: Background Notes - CSO - Central Statistics Office

[21] Ibid.

[22] Ibid.

[23] DJELR (2000), "Review of the Coroner Service", Report of the Working Group, accessed at: https://www.drugsandalcohol.ie/5396/1/Dept_JELR_ReviewCoronerService.pdf

- Difficulties re jurisdictional powers, impinging on core task of coroners;
- Lack of a user-friendly review system; and
- Constitutional issues re compellability of witnesses and citation to the High Court in relation to contempt.[24]

The Working Group recommended drafting of a new legislative Act to incorporate their recommendations as follows:[25]

- Introduce Coroner's Rules based on regulations, with "best practice" guidelines developed by coroners, including areas where coroner discretion is indicated;
- Changes to jurisdictional powers to ensure coroners can investigate circumstances surrounding a death (not confined to establishing proximal or medical cause of death);
- Introduce new review system where Attorney General retains power to order an inquest but will do so with benefit of recommendations from a specially-constituted Review Board; and
- Availability to the coroner of a consultative case-stated procedure.

Recommendations by the Working Group specific to inquests and suicide include:

49. The jurisdiction of the coroner should include the investigation not only of the medical cause of death but also the investigation of the circumstances surrounding the death. This should be expressed in positive terms in the new Coroners Act.
50. Coroners should continue to be disallowed from considering matters for the purpose of apportioning civil or criminal liability.
51. Given clarification on coroner jurisdiction, suicide verdicts should be returned whenever it has been established beyond a reasonable doubt that a person has taken their own life.
52. Verdicts should reflect both the results of the investigations as to the medical cause of death and the circumstances surrounding a death. Guidelines regarding the reaching and wording of verdicts in general, should be the subject of Coroners Rules.
53. The practice whereby coroners or juries can make general recommendations to prevent further fatalities should be continued.

In its discussion of the recommendations listed above, the Working Group considered the implications of the coroners' role in investigating and establishing cause of death:

> "Since the coroner is disallowed from establishing criminal or civil liability, it has to be said that there are some dangers in prolonging or extending the brief in relation to establishing the cause of death. There is a balance needed between the continuum where at one extreme, a coroner may only register the proximate medical cause of death and at the other, carries out what amounts to a full judicial investigation as if liability were to be determined. In securing that balance, the Group are unanimous in their view that it is not appropriate to confine the investigation to the proximate medical cause of death as some interpretation of the legislation has indicated. This view does not, the Group believes, take into sufficient account the core reason for having a coroner system in the first place. Coroner jurisdiction should extend not only to establishing the medical cause of death but also to investigating the surrounding circumstances of death. The Group also felt that unlike the present wording

[24] Ibid. at p. 4
[25] Ibid.

> in the Act, the duties and powers of a coroner at an inquest should be stated in positive terms along the following lines: *The inquest has a duty to establish the following: the identity of the deceased, when and where the death took place, the medical cause of death and the surrounding circumstances of death: in establishing this, the coroner is not permitted to allow any consideration of these matters which apportions civil or criminal liability*."[26]

The Working Group further noted that:

> "…verdicts such as suicide are problematic in that they can be considered to go beyond the proximate cause of death..." and that "there was general agreement in the Group that if it was proved beyond reasonable doubt that a person took their own life, then a verdict of suicide should be recorded. Suicide verdicts should be returned as appropriate and the Group believes that this is in the interests of society generally, including relatives. Of paramount importance, however, was the sensitive handling of such cases by coroners and the need for support services to deal with bereaved families."[27]

Proposed Coroners Rules are included in Appendix H of the Working Group Report. Those recommendations relevant to this discussion on legal issues around suicide include the following:

> 7.1 WHAT VERDICTS ARE AVAILABLE TO THE CORONER?
>
> - Accidental death
> - Death by misadventure (e.g., heroin overdose)
> - Medical accident/misadventure (this imparts no blame or wrongdoing on behalf of the doctor and would be used, e.g., where complications arose from a medical procedure or administration of drugs
> - Suicide: In declaring a verdict of suicide there are three essential things to look for:
>   - Deceased took his/her own life without any third party involvement;
>   - The person was intent on taking their life; and
>   - There is proof beyond a reasonable doubt that injuries sustained are self-inflicted and the deceased has such intention.
> - Unlawful killing (must be proven beyond a reasonable doubt)
> - In accordance with the findings of a criminal court, Section 25, usually "murder" or "manslaughter" (These verdicts are not based on findings at the coroner's inquest but rather at criminal proceedings.)

3.5 England and Wales

The Coroners and Justice Act 2009 is the primary legislation underpinning coroners' responsibilities and proceedings in the England and Wales. Similarly to the Irish Coroners Act 1962 (Rev 2022), this requires reporting of all deaths, and the investigation of facts and circumstances surrounding deaths by unnatural, unexpected, and/or violent means. It allows coroners to provide a "short form

[26] Ibid. at p. 62
[27] Ibid.

conclusion" (i.e., single word) and/or a "narrative conclusion" as to cause of death. It is relevant to note that suicide was decriminalised in 1961 under section 1 of the Suicide Act 1961.[28]

Coroners (Inquests) Rules 2013 (SI 2013/1616) governs the format of recording inquest results, at which Note (iii) indicates that the standard of proof for narrative conclusions is "on balance of probabilities", which is the standard used in civil proceedings; and the standard of proof for short form conclusions of "unlawful killing" or "suicide" is the criminal standard, i.e., "beyond a reasonable doubt".

The coroner must decide whether the short form or narrative conclusion is appropriate[29] and this is based on the relative sufficiency and veracity of available evidence.[30] The coroner, where evidence is clear and convincing, uses the short form cause of death; and where evidence is sufficient for a jury to make a determination, the coroner may use the narrative form cause of death to describe circumstances surrounding the death. Additionally, the coroner must not leave a jury to make determinations where there is insufficient evidence to make a determination.

The standard of proof required was altered in 2020, however, when a case was brought to the Supreme Court challenging the results of an inquest involving a young man who was found dead in his prison cell with a bed sheet tied around his neck and attached to the bedframe. Application of the criminal standard, "beyond a reasonable doubt", was challenged on the basis of the fact that a coroner's inquest is not a criminal proceeding. There were some factual issues surrounding the deceased's state of mind and whether the requisite intent of fatal harm was proven. In the end, the court determined that the civil standard of "balance of probabilities" was appropriate, and reasoned that the original purpose for the higher standard of proof (beyond a reasonable doubt) was linked to the fact that suicide had been classified as a crime in past, and is no longer a valid support for use of the higher standard.[31] Since this ruling, the standard of proof for suicide in a coroner's inquest is "balance of probabilities".

3.6 Australia

Coroners Acts legislated in each of the states and territories govern the coronial system in Australia. Although there are differences among these Acts, it can be said that, in Australia, suicide is reportable to the coroner because it is an unnatural or unexpected cause of death.[32] A 2018 article by Jowett et al. provides a thorough analysis of the Australian legal system underpinning suicide determinations.[33] The authors examined legislation and case law throughout Australia relating to the determination of suicide, as well as government committee notes and studies. They found that "none of the Coroners Acts requires coroners to make an explicit determination of suicide or of a deceased's intent" and

[28] Suicide Act 1961 (legislation.gov.uk) accessed on 3.1.2024
[29] https://www.judiciary.uk/guidance-and-resources/chief-coroners-guidance-no-17-conclusions-short-form-and-narrative/ accessed on 3.1.2024
[30] Microsoft Word - LAW SHEET No.2 GALBRAITH PLUS.doc (judiciary.uk) accessed on 3.1.2024
[31] R (on the application of Maughan) (AP) (Appellant) v Her Majesty's Senior Coroner for Oxfordshire (Respondent) - The Supreme Court accessed on 3.1.2024
[32] Coroners Act 1997 (ACT); Coroners Act 2009 (NSW); Coroners Act 1993 (NT); Coroners Act 2003 (Qld); Coroners Act 2003 (SA); Coroners Act 1995 (Tas); Coroners Act 2008 (Vic); Coroners Act 1996 (WA)
[33] Stephanie Jowett, Belinda Carpenter and Gordon Tait, 'Determining a Suicide under Australian Law' (2018) 41(2) University of New South Wales Law Journal accessed on 3/1/2024 at: https://www.unswlawjournal.unsw.edu.au/wp-content/uploads/2018/04/UNSWLJ_41_2_JOWETT-CARPENTER-AND-TAIT_advance.pdf

that even the word 'suicide' is scarcely used in the Acts.[34] The Acts require coroners to find a 'cause of death' but it is left to the coroner to decide upon the relevance of 'how' a person died.[35]

The authors indicate that Australian case law also differs among jurisdictions relating to the admissibility of evidence in establishing cause of death and intent; therefore it is possible that a death classified as suicide in one state may not be so classified in another.[36] Jowett et al. (2018) discuss one possible definitional framework for suicide containing the following elements:

1. Voluntary or deliberate act of the deceased;
2. Intent behind the act was to end their own life; and
3. Conscious understanding, at the moment of engagement, that the act would necessarily result in death.

Each of these elements might be clearly present in many cases, although there are significant areas for doubt under each. For example, there is room for dispute as to the directness of the action in a case where a decedent may have induced police to shoot him.[37] Similarly, there is room for doubt in cases where the cause of death could have been by accident, e.g., drowning, drug overdose, falls, etc.[38] Finally, a requirement for "conscious understanding" could pose difficulties in determining suicide in cases involving anyone who legally "lacks capacity" such as a child, mentally ill person, or someone under the influence of chemical substances.[39]

When making determinations, coroners in Australia apply the civil standard of proof, i.e., balance of probabilities, but with the added *Briginshaw* principle, which derives from case law and indicates that the balance of probabilities must be coupled with "reasonable satisfaction" considering the "seriousness of the allegation made, the inherent unlikelihood of an occurrence of a given description, or the gravity of consequences flowing from a particular finding."[40] Jowett et al. (2018) note that this principle may lead to inconsistent findings among various coroners because of their perceptions, personal experience, and societal biases about the unlikely nature of suicide, or of the "gravity of consequences" thereof.[41]

The authors concluded that "coroners are minimally aided on the specifics of a suicide determination" by legislation. Practical matters of determination (e.g., intent, cause of death, etc.) and case law are inconsistent and sometimes difficult to apply. Final recommendations by Jowett et al. (2018) are:

1. Clear legal definition of suicide should be provided in Coroners Acts;
2. Application of the *Briginshaw* principle or other legal presumptions should be clarified and communicated to coroners; and
3. All inquests should be made available online and easily searchable as suicide findings are neither transparent nor accessible.[42]

[34] Ibid. at p 359
[35] Ibid. at p. 359, fn 33
[36] Ibid. at p. 361
[37] Ibid. at p. 364, fn 81
[38] Ibid. at p. 364
[39] Ibid.
[40] Ibid. at p. 370 and fn 137
[41] Ibid. at pp. 377-378
[42] Ibid. at p. 379

3.7 New Zealand

The Coroners Act 2006[43] governs the New Zealand coronial system and is broadly similar in content to coroners acts in the countries discussed above. Deaths of violent, unnatural, or unexpected nature must be reported and are subject to an inquest. There is no statutory definition of suicide or mention of evidence needed to make a determination of suicide. It only mentions suicide specifically as it relates to information protected from publication.

Suicide reporting is made by the Ministry for Health and Chief Coroner. The standard of proof for determination of suicide in New Zealand is "beyond a reasonable doubt".[44] As with Ireland and other countries discussed above, a coroner's inquest must be held when death is a result of sudden, violent, unnatural, or undetermined cause.[45] As discussed above, evidentiary issues surrounding intent require application of the facts to the law, and circumstances/cause of death can be complex and/or unclear.

In 2019, Jenkin et al. conducted a thematic study of New Zealand coroners' experiences in investigating suspected suicides.[46] They identified strengths and challenges of the NZ coronial system, and indicated that the "inquisitorial nature of the coronial system and coroners' wide powers of jurisdiction" are key strengths of the system.[47] They also indicated a need for more evidence when making findings of suicide, especially to determine intent and familial factors.[48] Coroners also identified as challenges to their work: poor coronial training, lack of action on foot of their recommendations, and the personal impact of working with suicides.[49]

3.8 Conclusion

In conclusion to the legal review, the legal origins of the beyond-a-reasonable-doubt standard have to do with the prior legal doctrine seeing suicide as a crime. Under this view there were both moral/ecclesiastical and economic impacts from determination of suicide, such as dishonourable burial or confiscation of property. The importance or applicability of the standard could be seen in two lights: the Blackstone view or the Whiteman view. Under the Blackstone view, the appropriateness of the application of the higher standard for suicide is to protect the innocent from either social/ecclesiastic condemnation and economic confiscation; under the Whiteman view, application of the higher standard to suicide is to provide a level of moral comfort to jurors or Coroners to be willing to make such determinations. The two views offer insight into why statutes and Coroners or other stakeholders are reluctant to change, but also perhaps suggest testable predictions as to which way a change might impact determinations, or perhaps a prediction that the expected change is ambiguous. Notably, the UK Supreme Court found that the rationale for the higher standard no longer applied. Using the civil standard with the Blackstone view predominating should yield higher measured rates while the reverse might hold under the Whiteman view (although the two might have cancelling effects).

[43] https://www.legislation.govt.nz/act/public/2006/0038/latest/whole.html#DLM377809
[44] https://www.health.govt.nz/system/files/documents/pages/reporting-suicide-data-2019.pdf
[45] New Zealand Coroners Act (2006)
[46] Jenkin, Gabrielle & Canty, Justin & Ernst, Sam & Collings, Sunny. (2019). Investigating suspected suicides: coroners' experiences. Death Studies. 46. 10.1080/07481187.2019.1699205. Accessed on 3.1.2024 at: https://www.researchgate.net/publication/337099712_Investigating_suspected_suicides_coroners%27_experiences
[47] Ibid.
[48] Ibid.
[49] Ibid.

4 Studies on Suicide Classification

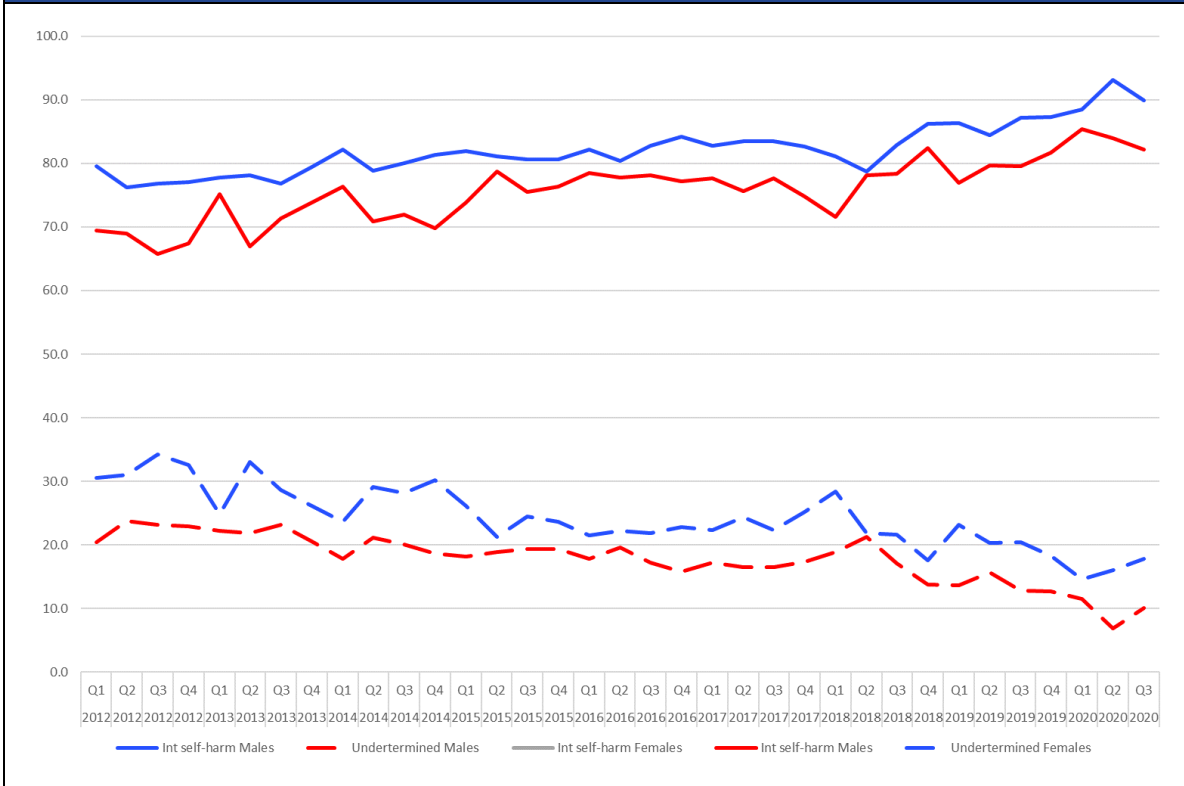
4.1 Introduction

A number of studies have already been conducted aiming to identify the statistical impact of burden of proof. This section reviews some of these studies.

4.2 ONS (England and Wales)

The ONS gave a detailed initial study into the impact of the classification change on suicide statistics in England and Wales. The method was to look at time trends and average rates before and after the change. They also looked at data on undetermined deaths for causes which might be particularly hard to classify. Notably, such trend comparison studies suffer from merely observing changes and correlations, with sufficient specificity to the assumptions that would allow attribution of causality. Overall, they concluded that the changes were broadly consistent with the lower standard of proof, i.e., that this may have increased the measured rates of suicide. Notably, certain official suicide statistics (of England and Wale) already include certain accidental deaths. The report gives substantial presentation of data, but a summary figure which illustrates the trends is shown below.

Figure 4.1: Share of Deaths Registered by Intentional Self-harm and Unintended in England and Wales



Source: Indecon calculations based on ONS Data

The report further finds that accidental deaths by drowning and hanging have been reduced, which poisoning has been substantially increased. The mechanism for the former is arguably that some of these deaths are being reclassified as intentional self-harm. The mechanism for the increase in poisoning is unclear, but ONS in another report notes that in recent years drug poisoning deaths have been increasing rapidly.[50]

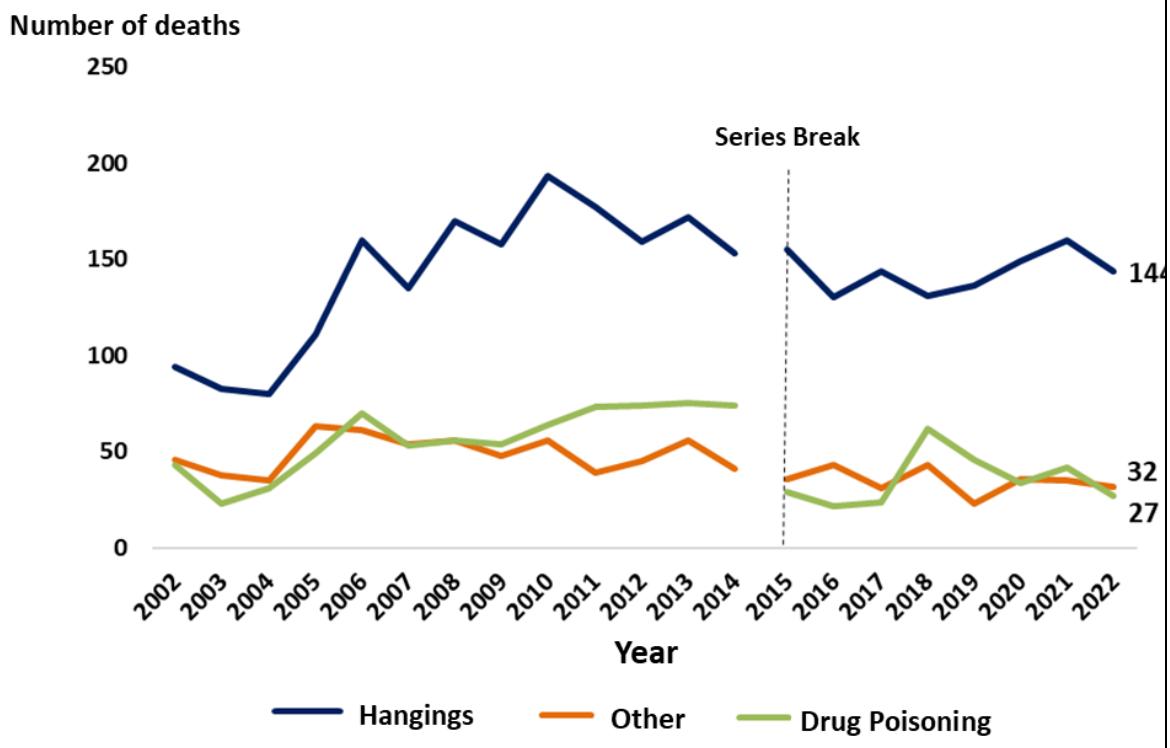
As a final conclusion the ONS finds that the data are consistent with the expectations of changes in the burden of proof making some death registrations changing from being recorded as unintentional versus intentional self-harm and notes that the registrations data already includes certain unintended deaths as suicide. "As such, when interpreting recent suicide death registration statistics, we cannot conclude that the change in the standard of proof is solely responsible for the recent increase in suicide rates. Whenever a change in suicide rates occurs, the reasons are complex and will seldom be because of one factor alone. The Office for National Statistics will continue to monitor over the coming years to further understand the impact of the change in the standard of proof on suicide rates."[51]

4.3 NISRA (Northern Ireland)

The Northern Ireland Statistical Research Agency (NISRA) also recently considered a number of aspects regarding suicide measurement, data and changes.[52] To note, NISRA revised statistics and there was thus a break in the series in 2014-2015. The rates post the break were about 11.5 deaths per 100k, or about 3.5 percentage points lower, and NISRA thus notes the need for caution in comparing rates over time. Despite this, NISRA also notes that the Coroners Service was centralised in 2006, and while rates appear to rise after 2006, while otherwise no clear trend seems evident.

[50]https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/bulletins/deathsrelatedtodrugpoisoninginenglandandwales/2018registrations.
[51] ONS, 2020, op cit, page 17.
[52] NISRA, Final statistics Statistical bulletin Suicide Statistics in Northern Ireland, 2002 – 2022 Published: 13th December 2023.

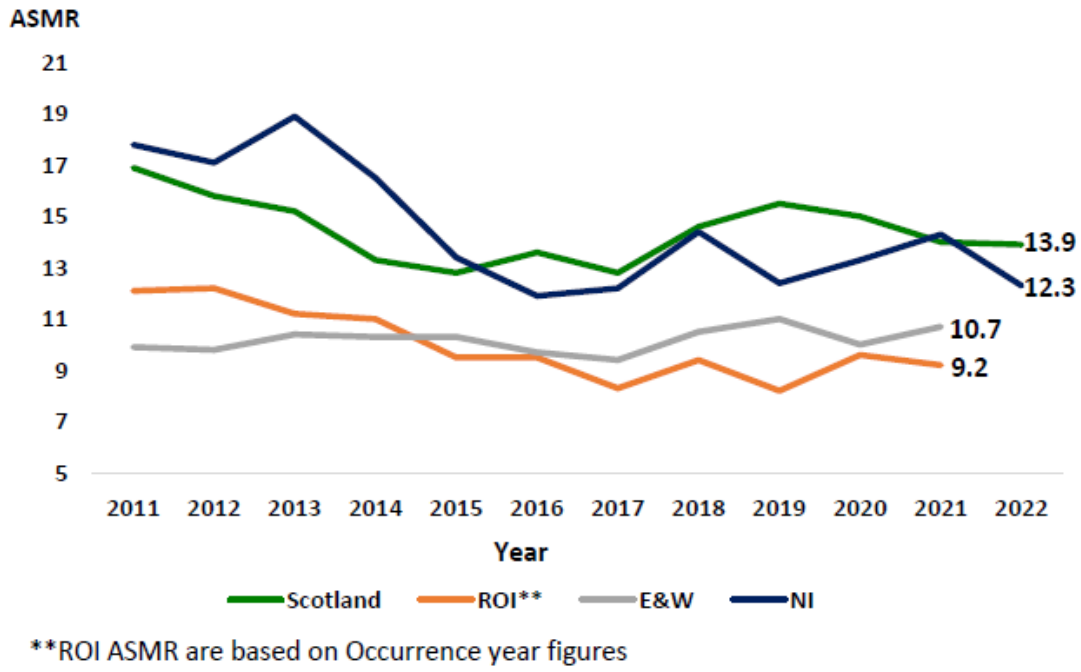
Figure 4.2: Classification of Deaths Registered in Northern Ireland



Source: NISRA (2023)

Notably, the definition of suicide and rates vary between NI and ROI. NISRA also compares the rates in NI based on the ROI definition, which excludes unintended deaths for those over 15 by certain causes such as poisoning and drowning. They find this would lower NI registered suicide rates from 12.3 to 10.1 deaths/100k, still above the 9.2/100k from 2021 cited for the ROI. Notably, the change of the burden of proof in NI was later than in England and Wales, where ONS states July 2018 and NISRA states its applicability to NI was confirmed in November 2018. Casual observation of the trends does not seem to suggest any clear change.

Figure 4.3: Trends on Deaths Registered



Source: NISRA (2023).
ASMR: Age-Standardized Mortality Rate

4.4 Canada

We now briefly review some recent studies in countries with English Common law legal systems. Canada changed their burden of proof for suicide in 2009. Observing rates in Canada over time and taking five years average before and after the change indicates this had seemingly little impact on overall measured death rates (11.16 vs 11.44 deaths per 100k).[53,54]

Skinner et al (2017)[55] considered the Canadian experience and possibilities that suicide rates are still being under reported in Canada despite the change in burden of proof and also with a particular focus on rising drug poisoning death rates in Canada. They use a variety of methods of comparing trends in ratios of unintentional, unintended, and intentional-self-harm ratios for poisonings. They find increasing rates but that unintentional rates seem to rise even relative to suicide rates overall for women (contrary to the expectation that unintentional rates might fall relative to intentional rates after the change in burden of proof). Finally, their data only cover to 2011, so any clear indication of trend impacts from the change in burden might be masked by the rapid rises in poisonings, and the lack of data post the change (only two years). They note that the rates of autopsy fell in Canada, and

[53] Ladouceur, Roger (February 2011). "Suicide among men". Canadian Family Physician. 57 (2): 148. PMC 3038797. PMID 21321162. Cited by Wikipedia: https://en.wikipedia.org/wiki/Suicide_in_Canada.
[54] "Deaths and age-specific mortality rates, by selected grouped causes". January 24, 2022.
[55] Skinner R, McFaull S, Rhodes AE, Bowes M, Rockett IRH. Suicide in Canada: Is Poisoning Misclassification an Issue? Can J Psychiatry. 2016 Jul;61(7):405–12. doi: 10.1177/0706743716639918. Epub 2016 Mar 23. PMCID: PMC4910407.

issues of differences across Provinces with standards to find suicide persist. "It is difficult to ascertain if there have been changes over time in the C/ME assessments, as procedures and standards differ by province. No standard protocol is followed."[56] They conclude, "Canadian poisoning suicide rates declined, in contrast to rising unintentional and undetermined poisoning mortality rates. This trend is similar to that of the United States, supporting the hypothesis that misclassification of poisoning deaths may also be an issue in Canada."[57]

4.5 United States

The work in Canada and experience was partly motivated by experience and work in the United States. Previous authors had found in the United States the large increase in accidental drug poisoning deaths may have masked suicide deaths. The United States represents a more difficult area of consideration and ability to interpret evidence as variations in States, Coroners and Medical Examiners, and legal standards abound, while the Center for Disease Control (CDC) operates national mortality statistics.[58] While the standard of proof in the US is not the criminal standard, a higher burden is often required for suicide determination by examiners, and the CDC has made efforts to give guidance to regularize reporting. Rockett and Caine (2015)[59] considered the context of the rapid rise in drug poisoning and related undetermined and suicide deaths and the issue of potentially underreporting. More recently,[60] Pergolizzi et al. (2021) explore opioid poisoning and intentionality of the facts and implications, stating that the rapid rise of opioid poisoning deaths leaves an open and widening question as to how many of such deaths should actually be classified as suicide. They propose an alternative category of 'passive' as well as 'active' intent as merely classifying as accidental many drug poisoning deaths may be masking certain aspects or importance of the problem and thus potential solutions.

4.6 Irish Probable Suicide Deaths Study

The Irish Probable Suicide Deaths Study (IPSDS) presents information on probable suicide deaths in Ireland, for a four year period from 2015 to 2018..[61] The main goals however did not focus on the change of the burden; they were: "to improve understanding of socio-demographics of suicide, to identify risk factors for probable suicide and to inform the planning, implementation and evaluation of suicide prevention measures in Ireland."[62] The study notes that coroners may be reluctant to determine suicide, and also that this was found to be the case in England and Wales.

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[56] Skinner et al op cit, page 410.
[57] Skinner et al op cit, page 405.
[58] Notably, "the Centers for Disease Control and Prevention use "unintentional injury" in lieu of the term *accident* for surveillance and prevention purposes. However, medical examiners and coroners remain bound by statutes in using "accident" as 1 of 6 manner-of-death entries (homicide, suicide, accident, undetermined, natural causes, and unknown) that alternatively appear on death certificates", Rockett IRH, Caine ED. Self-injury Is the Eighth Leading Cause of Death in the United States: It Is Time to Pay Attention. *JAMA Psychiatry.* 2015;72(11):1069–1070. doi:10.1001/jamapsychiatry.2015.1418
[59] Rockett IR, Caine ED. Self-injury Is the Eighth Leading Cause of Death in the United States: It Is Time to Pay Attention. JAMA Psychiatry. 2015 Nov;72(11):1069-70. doi: 10.1001/jamapsychiatry.2015.1418. PMID: 26374953.
[60] Pergolizzi J, Breve F, Magnusson P, Nalamasu R, LeQuang JAK, Varrassi G. Suicide by Opioid: Exploring the Intentionality of the Act. Cureus. 2021 Sep 18;13(9):e18084. doi: 10.7759/cureus.18084. PMID: 34692299; PMCID: PMC8523441.
[61] Cox, G., Munnelly, A., Rochford, S., & Kavalidou, K. (2022). Irish Probable Suicide Deaths Study (IPSDS) 2015–2018. HSE National Office for Suicide Prevention (NOSP). Dublin.
[62] Cox et al (2022), *op cit*.

The study pooled data on potential and/or likely suicide deaths in Ireland from 2015-2018 and was a 'collaborative project involving the HSE National Office for Suicide Prevention (NOSP), Irish coroners and the Health Research Board (HRB)'. Data and observations were included in the study based on a determination of 'probable suicide', using a variety of criteria, such as history, a note, where 'probable suicide' was defined as "deaths with a coronial suicide verdict *and* deaths that are more likely than not, based on the weight of evidence, to have been a suicide. The study then used an expert panel and analysis of secondary data, taking on board, Coroners', Autopsy, Toxicology, and Garda reports and data available.

The main findings of the study related to change in the burden are summarised below. Suicide numbers based on the current standard of beyond reasonable doubt would only account for 71% of male (probable) suicides, 64% for women and 69% for all persons.

Table 4.1: Classification of Deaths

Suicide Classification	Coroner's Verdict	Men %	Women %	Total %
Beyond reasonable doubt	Suicide or equivalent verdict	71%	64%	**69%**
Balance of probabilities	Undetermined/open verdict	10%	16%	**12%**
	Accident/Misadventure	3%	6%	**3%**
	No formal verdict recorded	16%	15%	**16%**

Source: IPSDS

4.7 Conclusion

This section reviewed a number of studies aimed at identifying the statistical impact of burden of proof. A summary of the key findings of this section are as follows:

- The ONS gave a detailed initial study into the impact of a classification change on suicide statistics in England and Wales and concluded that the changes were broadly consistent with the lower standard of proof, i.e., that this may have increased the measured rates of suicide.
- In Northern Ireland, NISRA compared the definition of suicide in ROI, and conclude that this would lower the NI registered suicide rates from 12.3 to 10.1 deaths/100k.
- Canada changed their burden of proof for suicide in 2009. Observing rates in Canada over time and taking five years average before and after the change indicates this had seemingly little impact on overall measured death rates
- The Irish Probable Suicide Deaths Study conducted a review of cases. Their estimates suggest that 31% of probable suicides are not currently being classified as suicides.

5 Econometric Analysis

5.1 Introduction

In this section we report estimates of the potential impact of a change in the burden of proof empirically using a difference-in-difference (DiD) approach which exploits the quasi-experimental nature of the change in policy in England and Wales versus Ireland.

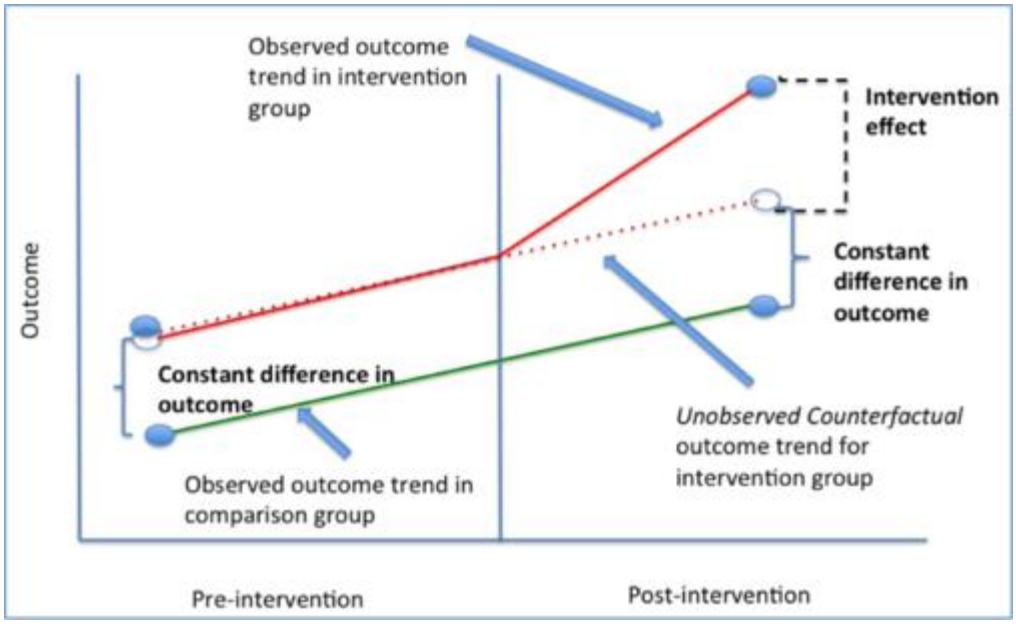
5.2 Methodological Overview

DiD is one of the 'most venerable[63]' workhorses for estimating causal impacts and has spanned economics, law, and public health research. The method's origins are in public health and attributed to Snow, an 1850s London physician studying Cholera.[64] Snow (1849) established evidence of contaminated water sources among poor districts in London and correlated this with Cholera; he then collected data several years later when the contaminated sources were closed.[65] A formal seminal study was Card and Krueger (1994), who studied impacts of changes in minimum wages between adjacent US States.[66] Recently, Dow et al (2020) used DiD methods to estimate the impacts of various policies including the minimum wage on both drug-related deaths and non-drug suicides (where they found such policies reduced non-drug suicides but not drug-related deaths).[67]

The DiD method is often illustrated graphically as shown below.[68]

[63] STATA 18, Reference Manual, "Introduction to difference-in-differences estimation", page 22.
[64] Tulchinsky TH. John Snow, Cholera, the Broad Street Pump; Waterborne Diseases Then and Now. Case Studies in Public Health. 2018:77–99. doi: 10.1016/B978-0-12-804571-8.00017-2. Epub 2018 Mar 30. PMCID: PMC7150208.
[65] Snow, J. 1849. On the Mode of Communication of Cholera. London: Churchill. (Cited in STATA 18 Reference Manual). Snow, 1855. On the Mode of Communication of Cholera. 2nd ed. London: Churchill. (Cited in STATA 18 Reference Manual)
[66] Card, David & Krueger, Alan B, 1994. "Minimum Wages and Employment: A Case Study of the Fast-Food Industry in New Jersey and Pennsylvania," American Economic Review, American Economic Association, vol. 84(4), pages 772-793, September. <https://ideas.repec.org/a/aea/aecrev/v84y1994i4p772-93.html>
[67] Dow WH, Godøy A, Lowenstein C, Reich M. Can Labor Market Policies Reduce Deaths of Despair? J Health Econ. 2020 Dec;74:102372. doi: 10.1016/j.jhealeco.2020.102372. Epub 2020 Sep 13. PMID: 33038779; PMCID: PMC8403492.
[68] Figure: https://www.publichealth.columbia.edu/research/population-health-methods/difference-difference-estimation

Figure 5.1: Graphic Illustration of DiD Method



Source: NISRA (2023)

DiD can be estimated via ordinary least squares (OLS) using fixed effects for countries, time periods and an interaction with time and treatment-group. The model estimated was:

$$SR_{it} = \sum_{i=1}^{N} \alpha_i c_i + \sum_{j=1}^{T} \alpha_j t_j + \delta T + \beta X + \varepsilon$$

Where SR is suicide rate[69] in country i at time, t; α_i are the country fixed effect, c_i; α_j are the time fixed effects, time index (years) t_j. The treatment variable, T, is a dummy variable coded for the treatment *and* country effect; it takes the value of 1 if year was greater than 2018 (Maughn was end July 2018) *and* country was England or Wales, and zero otherwise. This can be seen as the interaction of the time-controls and treatment. Then δ is the treatment effect parameter and ε is a random error. It is possible to add control variables, X, and coefficients β. These can be interactions or dummies for gender, or age category, and these vary by the particular models estimated.

It is important to discuss the assumptions of DiD and how they pertain to our model; the assumptions are:

no-treatment assignment endogeneity – assignment to the treatment group does impact the outcome; this is not an issue, as the mere assignment to treatment was determined for England and Wales Supreme Court decision and the implementation is by coroners and ONS. The Court's decision was independent of the treatment assignment.

[69] In the second set of models the dependent variable is deaths.

parallel trends – this is the most important assumption – there must be similar trends in the treatment and non-treatment groups pre-treatment. This assumption we subject to empirical testing via an F-test that the time-varying fixed effects vary by country. In general, the test is satisfied.

SUTVA: Stable Unit Treatment Values Assumption; consisting of:

a) No interference/spillover effects:[70] We argue that this is unlikely between countries.

b) No hidden variations of treatment/unambiguous definition of treatment: We argue this is satisfied by the clear definitions of the policy change.

5.3 Data

Data for the DiD study were obtained from the Office of National Statistics (ONS), the Central Statistics Office (CSO), and the Northern Ireland Statistics and Research Agency (NISRA), which are the national statistical agencies in England and Wales, Ireland, and Northern Ireland, respectively.[71] Two data sets were obtained each with yearly data; one on aggregate suicide rates and one on deaths by detailed ICD-10 cause, age and gender category. The second set of data was only available for England and Wales and Ireland.

The first dataset and models used aggregate suicide rates by year and sex from ONS. Data on both aggregate suicide rates by sex and year were also obtained from CSO. As this data was not particularly up-to-date, data on total suicides and population predictions from CSO were also obtained, along with data on late registrations over time. We then used historical late registrations and the aggregate data to predict late registrations for the years 2020-2022 for Ireland.[72]

The ONS data was taken from tables 1 and 2 of Suicide Registrations in England and Wales, where registrations are broken down by sex and year from 1981 to 2022. The CSO data was taken from tables VSD32 which provides deaths and rates by gender and year from 2000 to 2022, but where 2022 data is provisional, VDSD33 which provides registrations and late registrations by gender and year to 2020, and also population annual projections. The NISRA data is from Suicides in Northern Ireland, table 4, which gives standardized rates to 2022. Data across countries was then merge-appended to form a panel by sex, country and year.

The second dataset consisted of detailed deaths data based on ICD classification. This data was obtained from ONS[73] and CSO[74] from their websites. This data classifies number of deaths by ICD-10 classification. The usefulness of this second dataset is it enables us to compare official death statistics controlling for potential differences between classification of unintended deaths, as noted by Samaritans.[75] The data are fully disaggregated and coded by 4-digit ICD-10 code. We specifically coded separate group variables for ICD X60–X84 as intentional self-harm and ICD Y10–Y34 as unintended for further analysis.

[70] The potential outcomes for any unit do not vary with the treatments assigned to other units and a subject's potential outcome is not affected by other subjects' exposure to the treatment. See Imbens, Guido W, and Donald B Rubin. 2015. Causal Inference for Statistics, Social, and Biomedical Sciences: An Introduction. Cambridge University Press.
[71] Data was accessed from public online sources and downloaded around end January 2024.
[72] The results and details can be provided in the annex. We did sensitivity testing and in general the DiD results are not sensitive to the assumptions of this modelling. This only applied to the aggregate rate data for Ireland.
[73] 21st Century Mortality dataset, England and Wales, 2000 to 2022 Information Source: Office for National Statistics, Released: 15 December 2023
[74] CSO, table VSA29, Deaths Occurring, 31/10/2023 11:00:00
[75] *Op Cit*.

5.4 Econometric Results

The STATA 18 xtdid command was used for estimation, which forms the country-specific and year-specific dummy, or fixed effects, variables automatically, and usefully provides estimates of the Average Treatment Effect on the Treated (ATET)[76], tests of parallel trends, and graphics, along with adjustment of standard errors for clustering. Results are presented in the table below.

Table 5.1: Summary Results of Econometric Analysis

Sample Countries	Dep Var	Time dummy	Gender	ATET	p-value	Obs	P-Trends F
E&W, RoI, & NI	Suicide rate	yearly	All	2.50	0.001	131	F<F*
E&W, RoI, & NI	Suicide rate	yearly	M/F	2.41	0.001	262	F<F*
E&W, & RoI	Suicide rate	yearly	All	2.44	0.006	110	F<F*
E&W, & RoI	Suicide rate	yearly	M/F	2.55	0.003	220	F<F*
E&W, & RoI	Suicide rate	5-year	M/F	2.59	0.002	220	F<F*
Wales & RoI	Suicide rate	yearly	M/F	2.39	0.012	136	F<F*
RoI & NI (as treated)	Suicide rate	yearly	M/F	0.135	0.978	94	F>F*

Source: Indecon. Ages: All_aggregate

The table presents results from DiD regressions on aggregate annual suicide rates and treatment being the change in proof standard. Various combinations of England and Wales, Northern Ireland and Republic of Ireland models were tested. The tested hypothesis is that there is a +treatment effect of the policy change in E&W—i.e., ATET>0; that the measured rate increases. The full sample including rates by male/female and including NI comprised 262 observations. This model allows interactions between the dummies for country and sex. Including interaction controls does not impact the ATET but does impact the standard errors. The ATET estimate was 2.50 (p-value 0.001) and R^2 of 94%. The estimate of the sample on combined all-population (i.e., male and females aggregated) had 131 observations and the estimate of the ATET was 2.41 (p-value 0.001) with R^2 of 53%. In all the models, the F-statistic is less than the critical value (F<F*), indicating we do not reject the parallel trends null hypothesis.

While NI might be a good comparator for RoI, the two-way DiD between NI and ROI did not satisfy parallel trends. A sensitivity then ran the DiD without NI. DiD comparing only England & Wales and Ireland had 220 observations and yielded an estimated ATET of 2.55 (p-value 0.004) and R^2 of 96%.

Inclusion of interactions with gender did not largely change these estimates and using parallel trends was not sensitive to any of these changes.

[76] The ATET is the common measure of treatment as an average change in the group or jurisdiction receiving the policy change (treatment), in this can change of proof burden.

As a sensitivity, we ran the DiD with five-year block time dummies (as opposed to each individual year) and a linear trend variable (year) which was interacted with sex, thus allowing linear trends to be variable overall and by gender. The overall resulting ATET showed almost no sensitivity to this, with an ATET of 2.59 (p-value 0.002). With a further confirmation via the F-test for parallel trends (F(1,2) 1.33, p-value 0.367) indicating cannot reject parallel trends. The results of the F-test are p-value 0.259, so we cannot reject parallel trends.

As there are detailed differences in classification between England and Wales and Ireland, we considered a model using ICD classified data. The next set of models and results use the disaggregated data by ICD-10 classification, five-year age bands, and gender. Combining over all causes, years and countries (2001-2022 E&W) and (2007-2021 IRL) and age and gender gave over 1.3 million observations. A variety of models using DiD were estimated for deaths by both intentional self-harm and unintended death as per the ICD-10 categories described in the data section. We further looked into separate estimates by narrower age bands and by male and female only. Finally, we considered both intentional self-harm and unintended ICD categories. The results are found in the next table.

Table 5.2: Results by 5-Year Age Categories

Sample Countries	Time dummy	Gender	Ages	ATET	p-value	Obs	P-Trends F
E&W, and RoI ICD X60-X84 (Int self-harm)	yearly	M/F	All_5yr_cats	1.27	0.033	22,129	Prob > F = 0.8271
E&W, and RoI ICD X60-X84 (Int self-harm)	yearly	M/F	15-29	2.015	0.056	3,210	Prob > F = 0.0875
E&W, and RoI ICD X60-X84 (Int self-harm)	yearly	M	15-29	2.744	0.021	1,701	Prob > F = 0.0984
E&W, and RoI ICD X60-X84 (Int self-harm)	yearly	F	15-29	1.505	0.021	1,509	Prob > F = 0.0114
E&W, and RoI ICD Y10-Y34 (undet intent)	yearly	M/F	All_5yr_cats	-0.981	0.001	19,946	Prob > F = 0.0846
E&W, and RoI ICD Y10-Y34 (undet intent)	yearly	M/F	15-34	-0.805	0.012	4,263	Prob > F = 0.9935
E&W, and RoI ICD X60-X84 & Y10-Y34	yearly	M/F	All_5yr_cats	1.144	0.039	42,075	Prob > F = 0.2396

Source: Indecon. Dep Variable: Deaths

The first row of the table is all deaths included with controls for age and sex and the DiD approach to dummy country and year. Only England and Wales, and Ireland are included as these were the only countries with publicly published disaggregated ICD data. The ATET is 1.27 deaths for the ICD-10 intentional self-harm categories, X60-X84 in the first model. The total number of observations is over 22,000. The youngest age categories were excluded. The F-statistic for parallel trends is well below the critical value, so the Prob>F value is near unity indicating strong evidence that the null hypothesis of parallel trends is valid.

The ATET from the ICD models are 'deaths' per ICD-age/gender catetory so to interprete the ATET in relative terms, one must calculate the % change relative to the mean of the categories. So the aggregate model, which was an average of 16.3 deaths across all ages for males and females, had an ATET of 1.27, which is a 7.8% increase in England and Wales. We did not try and convert these into rates per head of population by each category, as this level of population detail over time and age/sex is not available and would have involved attempting to predict age/sex categories over time and matching them to the ICD statistics/categories. The overall scale differences between E&W and RoI do not matter for our DiD, although we convert deaths into a %-change for E&W to make inference about the scale of the effect.

Observing the next rows of the table, we focused on the three younger age categories covering ages 15-29 and estimated models pooling sex and separately for males and females. All the models indicate statistically significant ATETs. Again, in terms of interpreting %-change, the pooled model would indicate 9.8 deaths for both males and females across all ICD-10 self-harm categories for ages 15-29 from 2019 to 2022. Thus, the ATET of 2.015 represents a 20.5% increase in the number of deaths. For the separate models, average deaths for males was 12.8, and so the ATET of 2.74 represents an increase of 21.5%. For females of the same ages and times the average was 6.16 and the ATET was 1.505, indicating an estimated increase of 21.4%. Of note is that for the pooled and male models, parallel trends is weakly accepted (reject at 10% level) but acceptable at 5% level or lower. However, for the female model on younger ages, parallel trends is rejected. We conclude that the importance of the change in burden of proof was proportionally larger for young people, but additional refinement would be required to conclude the impact on young females was indeed larger.

Next, the third to last row of the table contains the results for deaths of undetermined cause, ICD 10 Y10-Y34.[77] The hypothesis is that for E&W and Ireland undetermined deaths are a substitute for suicides statistically and the policy change impacted this. The expectation is a negative and significant impact of the change in burden of proof in E&W; which is what we find. The estimated ATET is -0.981, which is significant as indicated by the p-value near unity. Parallel trends holds at <5% significance. The estimated reduction represented a 34% reduction in undetermined deaths.

We repeated the undetermined DiD for ages 15-34 and pooled sexes; parallel trends holds and the ATET is significant. For younger ages, this was a reduction of -0.805, or about a 25% reduction.

The final row of the table estimates the ATET of the two together, i.e., combined ICD-10 categories of intentional self-harm and undetermined, to see if there is still a significant impact of the policy. Indeed, the estimated ATET is still positive and significant albeit smaller, with an ATET estimate of about 1.44 deaths. The results of the pooled deaths across ICD self-harm and undetermined categories indicated an ATET of 1.144 or a 9.4% increase.

Limitations should be noted. Besides the normal caveats that the method's assumptions may have been satisfied but the results still invalid (e.g., type 1 or 2 error, model form invalid, etc), a key proposition is that the estimated impact for England and Wales is a reasonable predictor for the impact of a potential change for Ireland. This conclusion is nonetheless corroborated by the IPSDS work; it seems reasonable that the actual numbers of verdicts changing might be predicted to be smaller in practice than in the IPSDS. The finding the actual change might be somewhat lower is consistent with the legal review and the IPSDS's stated view that factors such as coroners' reluctance to conclude suicide, or the likelihood that more ambiguous cases may not have been included in the IPSDS.

[77] As noted in Samaritans and previously, it could be important to calculate the impacts of this separately as there are differences is official statistics between ONS and CSO.

6 Discussion and Conclusions

The legal and philosophical origins of the burden of proof as beyond a reasonable doubt and its application to suicide determinations gives useful insight into a number of factors which formed antecedents to our empirical study, such as why legal and other institutions are reluctant to change.

It also is important to consider the comparison between the various other empirical studies and our results. While very few previous studies exist in the area, England, Wales, and Canada recently changed their burdens, but clear impacts or trends do not emerge. A number in countries such as Canada and the USA considered trade-offs and policy implications of suicide determinations for drug poisoning, but these studies only shed light on the difficulties of classification and policy implications.

Of relevance, the IPSDS suggest that only 69% of probable suicides would meet the 'beyond a reasonable doubt' standard. Our estimates were on rates and deaths and the impacts estimated on England and Wales from the change. These ATETs were about 2-2.5 (rates per 100k). Given rates of about 10-12 in England and Wales, and Ireland, these estimates are a 20-25% increase in the rate, which, given about 500 deaths per year, would be about 100-125 deaths increase by change in the classification. The estimates using ICD-10 deaths were slightly more modest, but were generally between 10-20% increase, indicating a predicted change in Ireland of 50-100. There are likely differences across age groups but definitive estimates using DiD on subpopulations by gender and age group yielded mixed results in part because of violation of parallel trends.