Hospital-presenting self-harm and ideation: Comparison of incidence, profile and risk of repetition

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Abstract

Objective: The aim of this study was to describe presentations to hospital as a result self-harm or suicidal ideation and to examine patterns of repetition.

Method: Presentations made to hospital emergency departments in Northern Ireland following self-harm and ideation between April 2012 and March 2017 were recorded by the Northern Ireland Registry of Self-harm. Person-based rates per 100,000 were calculated using national population estimates. Risk of repeat attendance to hospital was examined using Kaplan-Meier analyses.

Results: A total of 62 213 presentations to emergency departments following self-harm or with ideation were recorded. The rate of self-harm was more than twice the rate of hospital-presenting ideation. Rates of ideation were higher among men, and both self-harm and ideation rates peaked for girls aged 15-19 and men aged 20-24 years. The cumulative probability of repeat attendance to hospital was higher following ideation (52% after 12 months), primarily because 12% of ideation presentations were followed by a subsequent self-harm presentation, whereas 4% of self-harm presentations were followed by ideation.

Conclusions: Our findings indicate that hospital presenters with ideation are at high risk of future self-harm. The transition from ideation to suicidal behaviour is important to consider and research could inform effective and early intervention measures.

Keywords: self-harm, suicidal ideation, hospital, emergency department, repetition.

1. Introduction

Suicidal behaviour is a significant cause of morbidity and mortality worldwide (Naghavi, 2019). The continuum of suicidal behaviour ranges from thoughts of self-harm and/ or suicide to engaging in self-harm, both fatal and non-fatal (Goodfellow *et al.*, 2018). Emergency department settings have been identified as important environments for suicide prevention in order to engage with and offer early interventions for those at risk of suicide, and several registries exist which monitor the incidence of self-harm to hospital emergency departments (Carroll *et al.*, 2017, Geulayov *et al.*, 2016, Perry *et al.*, 2012).

In addition to self-harm, individuals who present to hospital with thoughts of self-harm or suicide (self-harm and/ or suicidal ideation) may also be at risk of suicide. In Northern Ireland, there are approximately 3,500 hospital presentations annually as a result of suicidal ideation, where no act of self-harm has occurred (Public Health Agency, 2016). Much of the literature on ideation in acute settings has consisted of studies which screen for ideation among all hospital presenters, estimating that between 6-10% of presentations to hospital are experiencing ideation (Ceniti *et al.*, 2018, Claassen and Larkin, 2018). Few studies have examined the profile of individuals who present to hospital emergency departments as a result of ideation (Hawley *et al.*, 1991, Owens *et al.*, 2017), with most studies on the topic reporting self-harm and ideation presentations as one group (Miller *et al.*, 2017). Therefore is not clear if individuals presenting with ideation are a distinct group to those presenting with self-harm. In addition, there exist no clinical guidelines for the treatment and management of ideation in acute settings.

The aims of this study were to describe presentations to hospital as a direct result of self-harm or ideation in Northern Ireland, and to examine if those presenting with self-harm and ideation are two distinct patient groups.

2. Methods

2.1 Study design and participants

The Northern Ireland Registry of Self-harm records information on presentations to hospital emergency departments as a direct result of self-harm or ideation (self-harm and/or suicidal). Since 2012, the Registry has recorded data from all twelve acute hospitals in Northern Ireland. For this study, all presentations made to hospital during the period April 2012 to March 2017 were included.

Self-harm is defined by the Registry as 'an act with non-fatal outcome in which an individual deliberately initiates a non-habitual behaviour, that without intervention from others will cause self-harm, or deliberately ingests a substance in excess of the prescribed or generally recognised therapeutic dosage, and which is aimed at realising changes that the person desires via the actual or expected physical consequences' (Schmidtke *et al.*, 1996). This is an internationally-recognised definition of self-harm, which is consistent with that used by similar systems in Ireland (Perry *et al.*, 2012) and England (Geulayov *et al.*, 2016).

Presentations as a result of thoughts of self-harm and/ or suicide (hereafter referred to as ideation) are also recorded by the Registry. This is a broader category than suicidal ideation, which is defined as 'Passive thoughts about wanting to be dead or active thoughts about killing oneself, not accompanied by preparatory behaviour' (Posner *et al.*, 2007). Acts of ideation include presentations by persons who have experienced thoughts of self-harm and/or suicide, where no physical act has taken place. These include acts where no physical harm has taken place due to self-interruption and excludes cases where acts were interrupted by others (recorded as self-harm).

2.2 Data items

Presentations to hospital emergency departments are identified and recorded by data registration officers who work independently of the hospitals. The data registration officers receive standardized training and adhere to standard operating procedures and consistent inclusion and exclusion criteria. Case ascertainment for the Registry involve a combination of manually checking presentations to

hospital emergency departments, electronic keyword searches of emergency department notes, and triage coding by hospital staff. Full details of the standard operating procedures of the Registry have previously been described (Corcoran *et al.,* 2016; Griffin *et al.,* 2014). This approach is used in other countries (e.g. Perry *et al.,* 2012) and is a template endorsed by the World Health Organisation (WHO, 2016). The Registry records a range of data items including both demographic and clinical information relating to the presentation, including gender, age, date and hour of presentation to hospital, mental health assessment and recommended next care. Methods of self-harm are recorded according to the World Health Organization's ICD-10 classification system. Alcohol involvement is recorded for both presentations of self-harm and ideation. The involvement of alcohol was recorded in a systematic way by data registration officers, according to standard operating procedures. Alcohol involvement is ascertained through hospital case notes—if it was recorded on registration or by the attending clinician, or if present on toxicology reports. The Registry records if a mental health assessment was conducted in the emergency department at the time of attendance to hospital. It is also recorded if a patient was referred for an assessment at a later time in the general hospital/ offsite, if an assessment at the time of attendance was not possible or not immediately required.

2.3 Ethical approval

Ethical approval for the Northern Ireland Registry of Self-harm has been granted by the Office for Research Ethics in Northern Ireland (ORECNI).

2.4 Statistical analyses

The incidence of hospital-presenting self-harm and ideation for April 2012 to March 2017 was calculated using the sum of the number of Northern Ireland residents who presented to hospital in each year divided by the sum of the annual population estimate and expressed per 100 000. Annual population estimates were obtained from the Northern Ireland Statistics and Research Agency. Exact Poisson 95% Confidence Intervals (CI) were calculated for the rates using Stata version 12.0.

Repetition was defined as re-attendance to a hospital emergency department with self-harm or with ideation. The follow-up time after a presentation to hospital varied depending on when the presentation occurred, as a fixed final data (31 March 2017) was used. Follow-up time ranged from 1 to 1 825 days. Repeat event analyses were used so that all repeat presentations were included in the analyses with each repeat presentation becoming an index presentation. The cumulative probability of repeat presentation following self-harm and ideation was examined using survival analyses. Kaplan-Meier failure curves were plotted to graphically illustrate time between repeat presentations. As it is difficult to ensure that an individual's first presentation to hospital in the study time period was their first ever presentation, survival analyses were replicated confining the dataset to persons whose first observed presentation was made after 1 April 2014 (i.e. no presentations in the period 1 April 2012 to 31 March 2014), presented in supplementary Figure 1. This method of creating an inception cohort has been used previously (Perry *et al.*, 2012).

Analyses were completed using SPSS 24 and Stata version 12.0.

3. Results

During the period 1 April 2012 to 31 March 2017, a total of 62 213 presentations to emergency departments in Northern Ireland following self-harm or with ideation were recorded, involving 28 906 individuals. The majority of these presentations involved self-harm (70%; 43 475). Overall, 22 910 persons presented with self-harm during the study period and 10 473 with ideation. The rate of hospital-presenting self-harm [325 (95% CI: 321-329) per 100 000] was more than twice the rate of hospital-presenting ideation [149 (147-152) per 100 000]. The male and female self-harm rates were almost identical at 327 (322-332) and 324 (318-329) per 100 000, respectively, whereas the male ideation rate was almost twice the female rate [191 (187-195) and 109 (106-112), respectively; Table 1].

		All	Male	Female
Self-harm				
	N	29 939	14 766	15 173
	Rate (95% CI)	325 (321-329)	327 (322-332)	324 (318-329)
Ideation				
	N	13 744	8646	5098
	Rate (95% CI)	149 (147-152)	191 (187-195)	109 (106-112)

Table 1. Annual person-based rates of self-harm and suicidal ideation per 100 000 by gender in Northern Ireland, 2012-2017

Figure 1 illustrates the rates of self-harm and ideation according to age and gender. Despite the overall difference in magnitude, the patterns by age were very similar. Peak rates for women were among 15-19 year-olds, at 1001 per 100 000 for self-harm and 242 per 100 000 for ideation. Peak rates for men were among 20-24 year-olds, at 897 and 425 per 100 000 for self-harm and ideation, respectively. The incidence of self-harm and ideation decreased with increasing age, with evidence of a secondary peak among 35-54 year-olds, particularly for self-harm. For self-harm, the male rate exceeded the female

rate in those aged 20-39 years. For ideation, the male rate exceeded the female rate in all ages, with the exception of 10-14 year-olds.

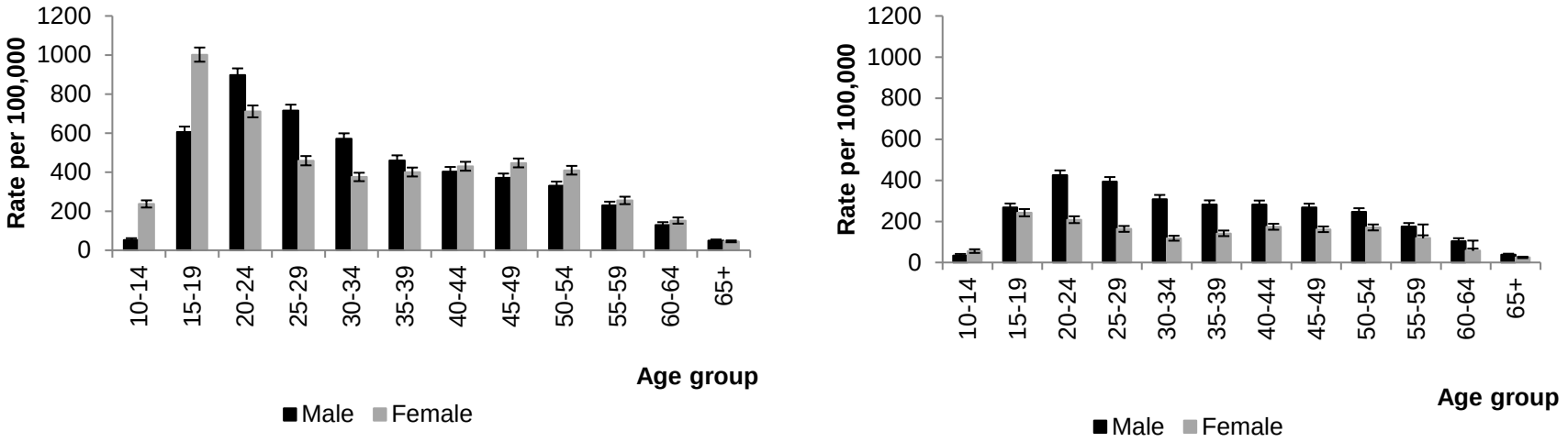


Figure 1. Person-based rate per 100 000 of self-harm (left) and ideation (right) by age group and gender

Self-harm and ideation presentations were similar in terms of time and day of presentation to hospital, with an excess of presentations to hospital on Saturday through Monday. Self-harm and ideation presentations increased during the course of the day, with peaks in the early hours of the morning. Alcohol involvement was marginally higher in presentations due to ideation (52.0% vs. 48.0%). Ideation presentations were less likely to be brought to hospital by ambulance (45.4% vs. 62.6%), but were more likely to be brought to hospital by emergency services (17.6% vs. 7.5%) or to self-present (37.1% vs. 30.0%). Presenters with ideation more often received a mental health assessment in the emergency department or were referred for an assessment (80.7% vs. 65.0%). Half of the self-harm presenters were admitted to a general ward in the hospital compared to 28.5% of ideation presenters. The latter were more likely to receive direct psychiatric admission (8.9% vs. 4.3%) and to refuse admission or to leave before recommendation (14.3% vs. 10.0%; Table 2).

	Self-harm (n=43 475)	**Ideation (n=18 738)**
Mode of arrival		
Ambulance	27 175 (62·6%)	8484 (45·4%)
Other emergency services	3249 (7·5%)	3287 (17·6%)
Self-presenting	13 019 (30·0%)	6935 (37·1%)
Mental health assessment conducted in emergency department/ referred for assessment [1]	22 584 (65·0%)	12 496 (80·7%)
Recommended next care		
General admission	21 665 (49·8%)	5344 (28·5%)
Psychiatric admission	1870 (4·3%)	1674 (8·9%)
Refused admission/ left before recommendation	4368 (10·0%)	2677 (14·3%)
Discharged from emergency department	15 572 (35·8%)	9043 (48·3%)

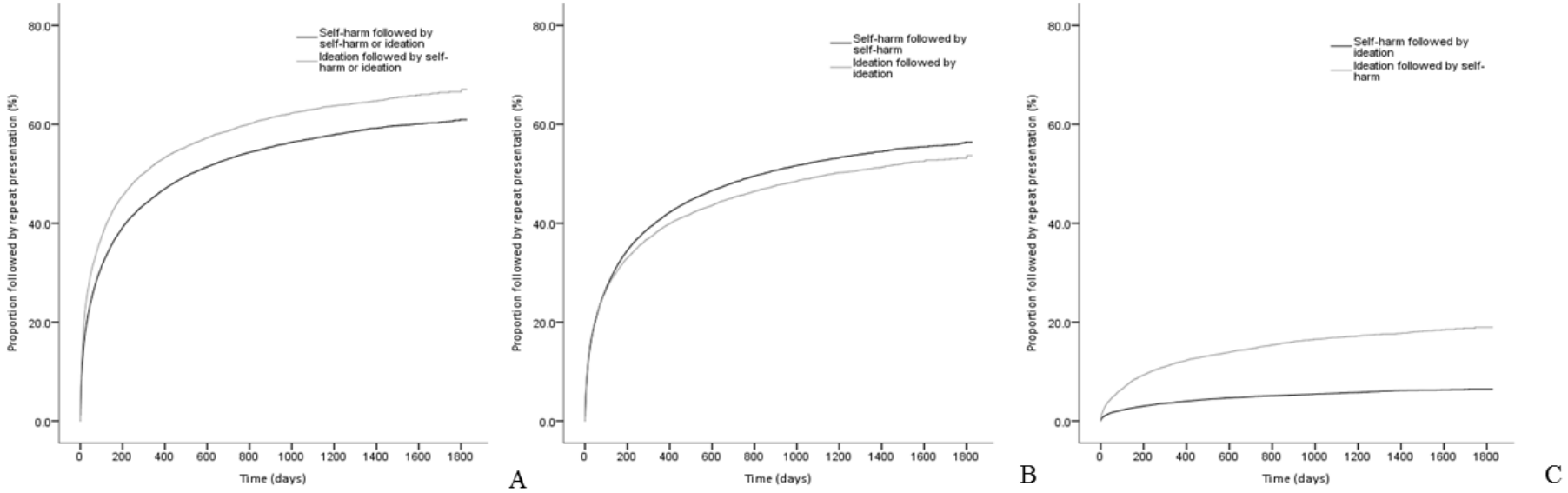
[1]Based on years 2013-2017 only

Table 2. Mode of arrival to hospital and hospital management following self-harm and ideation

3.1 Risk of repeat presentation to hospital

The cumulative probability of repeat presentation to hospital following self-harm and ideation and time to next presentation is illustrated in Figure 2. After 1825 days (end of study period) the risk of repeat presentation to hospital for either reason was 61% following self-harm and 67% following

ideation (Figure 2a). Risk of repetition was greatest in the short term. The three, six and 12 month risk of repeat presentation was 30%, 38% and 46% for self-harm, and 36%, 45% and 52% for ideation. The risk of repeat presentation for the same reason (i.e. self-harm followed by self-harm, or ideation followed by ideation) after 12 months was 41% for self-harm and 39% for ideation (Figure 2b). The risk of repeat presentation for the other reason (i.e. self-harm followed by ideation, or ideation followed by self-harm) after 12 months was greater for ideation (12%) than for self-harm (4%) (Figure 2c). When analyses were replicated using an inception cohort (only including those individuals who did not present to hospital between 1 April 2012 and 31 March 2014), the patterns of repetition were similar (see supplementary Figure 1).



Number at risk	12m	24m	36m	48m	60m
Self-harm	18 929	12 192	7558	3602	1691
Ideation	6934	4346	2592	1162	540

Number at risk	12m	24m	36m	48m	60m
Self-harm	20 528	13 379	8280	3971	1868
Ideation	8892	5833	3546	1603	775

Number at risk	12m	24m	36m	48m	60m
Self-harm	31 243	22 699	14 748	7249	3549
Ideation	11 025	7645	4844	2260	1108

Figure 2(a-c). Kaplan-Meier failure curves showing, for self-harm presentations and ideation presentations, the cumulative probability of a repeat presentation, for either reason (a), the same reason (b), the other reason (c). Numbers at risk at 12-month intervals are tabulated underneath.

4. Discussion

The aims of this study were, firstly, to establish an accurate picture of the extent of presentations to hospital as a result of self-harm and/ or suicidal ideation, using data from a regional Registry and, secondly, to compare their profile to hospital-presenting self-harm. Each year approximately 3700 presentations with ideation are made to hospital emergency departments in Northern Ireland. Between 2012 and 2017, the rate of hospital-presenting ideation was 149 per 100 000, more than 50% lower than the corresponding rate of self-harm. The age distributions for self-harm and ideation were remarkably similar, with peak rates recorded among 15-19 year-old women and 20-24 year-old men. In contrast to self-harm, presentations involving ideation were more common among men. Self-harm and ideation presentations were similar with regards to time of attendance to hospital and involvement of alcohol. Ideation presentations however were more likely to be brought to hospital by emergency services and to leave the emergency department without a next care recommendation. Furthermore, ideation presentations were more likely to receive a mental health assessment and to receive psychiatric inpatient admission. The risk of repetition following presentation to hospital with ideation was higher than following self-harm. In particular, ideation presentations were much more likely to represent with an act of self-harm, indicating a progression of suicidal behaviour.

Few studies have reported the incidence of presentations to hospital as a result of ideation. Our findings regarding the sex and age profile of those presenting to hospital with ideation are similar to a previous study of this population (Hawley *et al.*, 1991). A statistical brief of emergency department visits related to suicidal ideation in the United States reported an event-based rate of 376 per 100 000, with higher rates also reported among men (Owens *et al.*, 2017). However 7% of these presentations also involved a self-inflicted injury. The higher rate of ideation among men is striking, given that population surveys of ideation report a higher prevalence among women (Nock *et al.*, 2008b, O'Neill *et al.*, 2014) and that rates of hospital-presenting self-harm tend to be higher among women (Perry *et al.*, 2012). The lifetime prevalence of ideation in the general population is, on average, greater that the prevalence of self-harm or suicide attempts (Nock et al., *2008a)*, although a recent study of English adults reporting a lifetime prevalence of NSSH at 6% (McManus et al., *2019)* indicates that ideation

may no longer be much more common than self-harm. The finding that hospital-presenting self-harm was twice as common as hospital-presenting ideation in this study may be because a higher proportion of self-harm results in hospital presentation compared to ideation. Similar to self-harm, it is also likely that individuals who present to hospital as a result of their ideation may not represent the profile of those who express ideation within the general population. Those who seek help via hospital for ideation may be experiencing more acute ideation, and may be at heightened risk of self-harm and/ or suicide. To this end, targeted interventions in this specific setting may be beneficial for this group.

There are no formal clinical guidelines concerning management of ideation in hospital settings, and no mention of such presentations in national clinical guidance for self-harm (NICE, 2004). We reported that 81% of ideation presentations received or were referred for a psychosocial assessment while in the emergency department, compared to two-thirds (65%) of self-harm presentations. In addition, ideation presentations were more likely to be admitted to a psychiatric ward from the emergency department. This could be an indication of the psychiatric need of this group but may also be a consequence of the lack of physical care need. It is possible that presentations involving self-harm which require medical admission subsequently receive or are referred for an assessment, but this is not captured by the Registry. Findings from an Irish national clinical programme for self-harm in emergency departments show that 41% of patients assessed by specialist self-harm nurses involved ideation (Health Service Executive, 2017). However, given that 18% of presentations in the current study were brought to hospital by emergency services and those with ideation were more likely to leave the emergency department without a next care recommendation, there is a need for appropriate training and awareness of risk factors for those with ideation among emergency responders and medical staff. More than one-third of ideations presentations were made by individuals self-presenting to hospital. For the majority of these cases, no medical intervention would be required, and most of these presentations could be managed by primary case and community-based services. However, there may be a gap in existing community mental health services to support those expressing ideation. The development of primary care response services which provide early intervention for those experiencing a suicidal crisis or distress may be effective (e.g. Bradley *et al.*, 2012). In Northern

Ireland a test pilot initiative – the Multi-Agency Triage Team (MATT) – is underway, building on learnings from multi-agency street triage teams developed in other parts of the UK (Reveruzzi and Pilling, 2016). This initial service is delivered by paramedics, police and mental health professionals provides either an on-site response or telephone de-escalation to people experiencing an emotional or mental health crisis in the community. By addressing the presenting crisis issues, and by linking individuals to appropriate services, unnecessary emergency department attendances may be avoided.

The trajectory of suicidal behaviour is not well understood. Results of the World Mental Health Survey found that 41% of women and 33% of men who reported suicidal ideation made a subsequent suicide attempt (O'Neill *et al.*, 2014) and transitions to suicidal behaviour are most likely in the first year after onset of ideation (Kessler *et al.*, 1999). The risk of suicide or other causes of death following ideation has not been well established. A recent meta-analysis found that suicidal ideation was associated with more than a three-fold risk of suicide (McHugh *et al.*, 2019) but the authors noted considerable between-study heterogeneity. Our findings suggest that while there are some differences in the profile of those who attend hospital with self-harm and those who attend with ideation, there are a subgroup who present with both. In particular, the proportion of presentations of ideation who have a subsequent self-harm presentation is much greater than the proportion of self-harm presentation with a subsequent ideation presentation. Further research is required to identify the factors which are associated with repeat attendance to hospital following ideation.

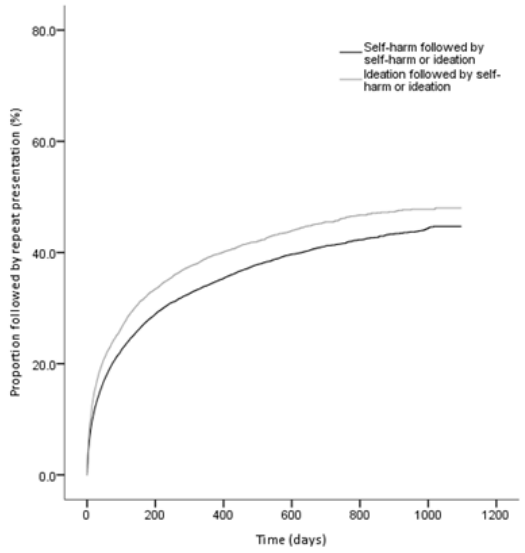
Based on our findings, those who present to hospital with ideation constitute an important clinical group and targeted interventions are important to consider for suicide prevention. In addition, similar studies are needed to establish the incidence of ideation presentations internationally. In a community sample, the prevalence of lifetime suicidal ideation in Northern Ireland was reported to be 11% among women and 7% among men (O'Neill et al., 2014), which is within the range of 6-14% reported internationally (Nock et al., 2008a). In Northern Ireland, persons with any mood, anxiety or substance disorder and those who had experienced trauma in their lives (O'Neill et al., 2014) were more likely to report suicidal ideation. Approximately one-third of residents of Northern Ireland have experienced a conflict-related trauma (Bunting et al., 2013), which may contribute to the relatively high incidence of

self-harm compared to neighbouring regions (Griffin et al., 2019). Thus the rate of hospital-presenting ideation may be higher among this population than in other countries. Surveillance systems for hospital-presenting self-harm are valuable clinical and public health tools, as well as providing an important role in suicide prevention activities (World Health Organisation, 2014, Witt and Robinson, 2019). However few national systems exist (Griffin *et al.*, 2018), with most being regional (Carroll *et al.*, 2017, Geulayov *et al.*, 2016, Vancayseele *et al.*, 2016) and at, present no other system includes cases of ideation.

To our knowledge, this is the first comprehensive study reporting on the incidence of presentations to hospital as a result of thoughts of self-harm and/or suicide. Data are recorded via a longitudinal Registry, covering all twelve acute hospitals in Northern Ireland. Data are collected by independently trained data registration officers who adhere to specific inclusion and exclusion criteria. The definition and operational criteria adopted by the Northern Ireland Registry of Self-harm records presentations where both thoughts of self-harm or suicide are present, including both active and passive ideation, regardless of whether there is intent to act on these thoughts. However there is lack of agreement in this field around defining ideation (McAuliffe, 2002), and most studies report on suicide ideation only. The definition of self-harm used by the Registry is one which is similar to that used by the English Multicentre Study and the National Self-Harm Registry Ireland, including a wide range of behaviours and motives. This definition does not distinguish between varying degrees of intent (e.g. non-suicidal self-injury or suicide attempts), therefore the findings in relation to self-harm may not be directly comparable with studies from the US.

This study has shown that while those who present to hospital with ideation appear to be a distinct group to those who present with self-harm, there is some overlap between these two populations – with a 12% risk of repeat self-harm for presentations involving ideation. We don't know how many of those who attend hospital with ideation will go on to die by suicide, but given that only a minority of suicides involve a history of self-harm (Judd *et al.*, 2012), ideation may be an important marker for suicide prevention (McAuliffe, 2002). We contend that the transition from ideation to self-harm is

important to consider and that further research could inform effective screening and early intervention measures.



Number at risk	12m	24m	36m
Self-harm	7250	3082	9
Ideation	2710	1130	3

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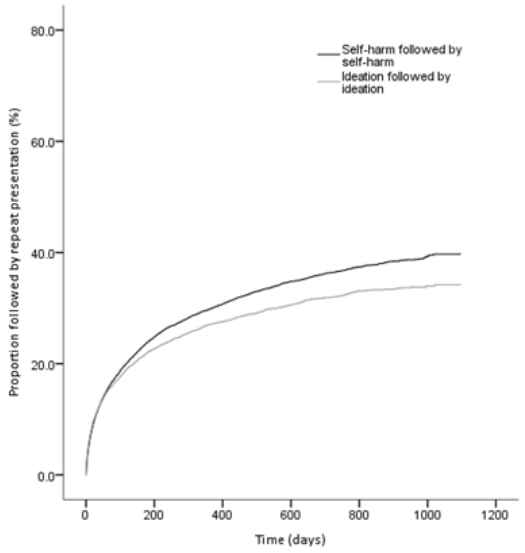

Number at risk	12m	24m	36m
Self-harm	7718	3315	9
Ideation	3243	1404	4

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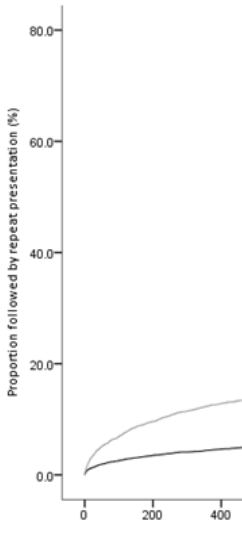

Number at risk	1
Self-harm	10
Ideation	3

Supplementary Figure 1(a-c). Kaplan-Meier failure curves showing, for self-harm presentations and ideation presentations, the cumulative probability of a repeat presentation, for either reason (a), the same reason (b), the other reason (c). Limited to individuals with no presentation to hospital between 1 April 2012 and 31 March 2014. Numbers at risk at 12-month intervals are tabulated underneath.

Acknowledgments

The Northern Ireland Registry of Self-harm is funded by the Public Health Agency, Northern Ireland. We would like to acknowledge the data registration officers for their work in recording data as part of the registry. We thank Linda Cassidy, Caroline Daly, Amanda O' Neill and Professor Ella Arensman for their input into the development and implementation of the operational criteria for the Registry.

Funding

The Northern Ireland Registry of Self-harm is funded by the Public Health Agency, Northern Ireland.

Conflict of interest

BB and DOH are employed by the Public Health Agency, Northern Ireland. This statutory body commissions both research and health and social care services. In this context they are involved in

both self-harm research and commissioning of services for people who self-harm. PC, EG and KK declare no conflicts of interest.

References

Bradley S, Murphy K, Devane D, Kennelly B, Meskell P, Dowling M, Smyth S, Tully A, Conway Y, Butler M, Jordon F (2012). Evaluation of the Suicide Crisis Assessment Nurse (SCAN) Service. Health Service Executive: Dublin.

Bunting BP, Ferry FR, Murphy SD, O'Neill SM, Bolton D (2013). Trauma associated with civil conflict and posttraumatic stress disorder: Evidence from the Northern Ireland study of health and stress. *Journal of Traumatic Stress* 26, 134-141.

Carroll R, Knipe D, Moran P, Gunnell D (2017). Socioeconomic deprivation and the clinical management of self-harm: A small area analysis. *Social Psychiatry and Psychiatric Epidemiology* 52, 1475-1481.

Ceniti AK, Heinecke N, McInerney SJ (2018). Examining suicide-related presentations to the emergency department. *General Hospital Psychiatry* [Epub ahead of print].

Claassen CA, Larkin GL (2018). Occult suicidality in an emergency department population. *British Journal of Psychiatry* 186, 352-353.

Corcoran P, Griffin E, O'Carroll A, Cassidy L, Bonner B (2016). Hospital-treated deliberate self-harm in the Western Area of Northern Ireland. *Crisis* 36, 83-90.

Geulayov G, Kapur N, Turnbull P, Clements C, Waters K, Ness J, Townsend E, Hawton K (2016). Epidemiology and trends in non-fatal self-harm in three centres in England, 2000–2012: Findings from the Multicentre Study of Self-harm in England. *BMJ Open* 6, e010538.

Goodfellow B, Kolves K, de Leo D (2018). Contemporary nomenclatures of suicidal behaviors: A systematic literature review. *Suicide and Life Threatening Behaviour* 48, 353-366.

Griffin E, Bonner B, Dillon CB, O'Hagan D, Corcoran P (2019). The association between self-harm and area-level characteristics in Northern Ireland: an ecological study. *European Journal of Public Health*. [Epub ahead of print].

Griffin E, Dillon CB, McTernan N, Arensman E, Williamson E, Perry IJ, Corcoran P (2018). National Self-Harm Registry Ireland Annual Report 2017. National Suicide Research Foundation: Cork.

Griffin E, Corcoran P, Cassidy L, O'Carroll A, Perry IJ, Bonner B (2014). Characteristics of hospital-treated intentional drug overdose in Ireland and Northern ireland. *BMJ Open* 4:e005557.

Hawley CJ, James DV, Birkett PL, Baldwin DS, De Ruiter MJ, Priest RG (1991). Suicidal ideation as a presenting complaint: Associated diagnoses and characteristics in a casualty population. *British Journal of Psychiatry* 159, 232-238.

Health Service Executive (2017). National Clinical Programme for the Assessment and Management of Patients Presenting to the Emergency Department following Self-Harm: Review of the Operation of the Programme. Health Service Executive: Dublin.

Judd F, Jackson H, Komiti A, Bell, R, Fraser C (2012). The profile of suicide: changing or changeable? *Social Psychiatry and Psychiatric Epidemiology* 47, 1-9.

Kessler RC, Borges G, Walters EE (1999). Prevalence of and risk factors for lifetime suicide attempts in the National Comorbidity Survey. *Archives of General Psychiatry* 56, 617-626.

McAuliffe CM (2002). Suicidal ideation as an articulation of intent: A focus for suicide prevention? *Archives of Suicide Research* 6, 325-338.

McHugh CM, Corderoy A, Ryan CJ, Hickie IB, Large MM (2019). Association between suicidal ideation and suicide: Meta-analyses of odds ratios, sensitivity, specificity and positive predictive value. *BJPsych Open* 5, e18.

McManus S, Gunnell D, Cooper C, Bebbington PE, Howard LM, Brugha T, Jenkins R, Hassiotis A, Wiech S, Appleby L (2019). Prevalence of non-suicidal self-harm and service contact in England, 2000–14: repeated cross-sectional surveys of the general population. *Lancet Psychiatry* 6, 573-581.

Miller IW, Camargo CA Jr, Arias SA, Sullivan AF, Allen MH, Goldstein AB, Manton AP, Espinola JA, Jones R, Hasegawa K, Boudreaux ED (2017). Suicide prevention in an emergency department population: The ED-SAFE Study. *JAMA Psychiatry* 74, 563-570.

Naghavi M (2019). Global, regional, and national burden of suicide mortality 1990 to 2016: Systematic analysis for the Global Burden of Disease Study 2016. *BMJ* 364, l94.

National Institute for Health and Clinical Excellence (2004). Self-harm in over 8s: short-term management and prevention of recurrence. NICE Clinical guideline CG16. (www.nice.org.uk/guidance/cg16). Accessed 25 June 2019.

Nock MK, Borges G, Bromet EJ, Alonso J, Angermeyer M, Beautrais A, Bruffaerts R, Chiu WT, de Girolamo G, Gluzman S, de Graaf R, Gureje O, Haro JM, Huang Y, Karam E, Kessler RC, Lepine JP, Levinson D, Medina-Mora ME, Ono Y, Posada-Villa J, Williams D (2008a). Cross-national prevalence and risk factors for suicidal ideation, plans and attempts. *British Journal of Psychiatry* 192, 98-105.

Nock MK, Borges G, Bromet EJ, Cha CB, Kessler RC, Lee S (2008b). Suicide and suicidal behavior. *Epidemiologic Reviews* 30, 133-154.

O'Neill S, Ferry F, Murphy S, Corry C, Bolton D, Devine B, Ennis E, Bunting B (2014). Patterns of suicidal ideation and behavior in Northern Ireland and associations with conflict related trauma. *PLOS ONE* 9, e91532.

Owens PL, Fingar KR, Heslin KC, Mutter R, Booth CL (2017). Emergency department visits related to suicidal ideation, 2006-2013. HCUP Statistical Brief #220. Agency for Healthcare Research and Quality: Rockville, MD.

Perry IJ, Corcoran P, Fitzgerald AP, Keeley HS, Reulbach U, Arensman E (2012). The incidence and repetition of hospital-treated deliberate self harm: Findings from the world's first national registry. *PLoS ONE* 7, e31663.

Posner K, Oquendo MA, Gould M, Stanley B, Davies M (2007). Columbia Classification Algorithm of Suicide Assessment (C-CASA): Classification of suicidal events in the FDA's pediatric suicidal risk analysis of antidepressants. *The American Journal of Psychiatry* 164, 1035-1043.

Public Health Agency (2016). Northern Ireland Registry of Self-harm regional three-year report, 2012/13 to 2014/15.

Reveruzzi B, Pilling S (2016). Street Triage: Report on the evaluation of nine pilot schemes in England. (https://www.ucl.ac.uk/pals/sites/pals/files/street_triage_evaluation_final_report.pdf). Accessed 26 June 2019.

Schmidtke A, Bille-Brahe U, De Leo D, Kerkhof A, Bjerke T, Crepef P, Haring C, Hawton K, Lönnqvist J, Michel K, Pommereau X, Querejeta Phillipe I, Salander-Renberg E, Temesváry B, Wasserman D, Fricke S, Weinacker B, Sampaio-Faria JG (1996). Attempted suicide in Europe: rates, trends and sociodemographic characteristics of suicide attempters during the period 1989–1992. Results of the WHO/EURO Multicentre Study on Parasuicide. *Acta Psychiatrica Scandinavica* 93, 327-338.

Vancayseele N, Portzky G, van Heeringen K (2016). Increase in self-injury as a method of self-harm in Ghent, Belgium: 1987-2013. *PLOS ONE* 11, e0156711.

Witt K, Robinson J (2019). Sentinel surveillance for self-harm. *Crisis* 40, 1-6.

World Health Organisation (2014). *Preventing suicide: A global imperative*. World Health Organisation: Geneva.

World Health Organisation (2016). *Practice manual for establishing and maintainig surveillance systems for suicide attempts and self-harm.* World Health Organisation: Geneva.