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Hospital-treated self-harm: Improving care through improved data

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Key Messages

- Self-harm accounts for more than 30,000 hospital admissions each year in Australia, and underpins multiple contacts with other community, outpatient and private health services. Improving care for people who self-harm not only improves people's immediate quality of life, it also has the potential to prevent suicides. Suicide is the third leading cause of years of life lost in Australia, the leading cause of death for adults 15-44 years and the ninth leading cause of death overall.
- Routine care is not always in line with best practice and many people report that contact with hospitals after self-harm does not meet their needs. Consistent best practice care is required to improve outcomes for people who have presented to hospitals after self-harm.
- Self-harm surveillance relies on data drawn from the clinical record for hospital admissions for self-harm. While there have been improvements in data accessibility, data infrastructure is not designed for the purpose of driving improvement in care at a service level. This is due to:
 - Current surveillance mechanisms undercount the number of cases
 - A lack of data linkage between hospital-treated self-harm presentation data and outcome data; and
 - Service quality indicators and audit and feedback loops not having been established to allow benchmarking.
- Patient and service needs will best be addressed through the establishment of a clinical quality registry for hospital-treated self-harm. The Government should support the interoperability and data harmonisation across identified units with emerging registry capability as a first step.

Executive Summary

Self-harm is a public health priority. It usually occurs in the context of psychological distress and is frequently directly associated with suicidal intent, psychosocial stressors and for many, mental ill-health. Hospital-treated self-harm accounts for over 30,000 hospital admissions each year and is the strongest independent risk factor for later suicide.

Routine care for hospital-treated self-harm is variable and can be substandard. Many people report that they experienced stigmatising, judgemental and invalidating responses when presenting to health services for help after self-harm or when in suicidal crisis. Furthermore, care is not meeting many patients' needs and linkage to mental health services after discharge is not routine. Despite this, there is no data infrastructure to support hospitals to address these issues. Instead, monitoring and service improvement relies on one-off or localised investigations.

Three key issues make hospital-treated self-harm surveillance data unfit for the purpose of service improvement. These include:

- Current surveillance mechanisms undercount the number of cases; resulting in service planning and modelling based on inaccurate snapshots of demand.
- Hospital-treated self-harm presentation data is not linked to outcome data; making it difficult for services to evaluate the impact of service delivery on key outcomes.
- Service improvement relies on local leaders' interest and capacity to translate and use available data rather than standards or quality indicators that all can work towards.

Establishing a clinical quality registry for hospital-treated self-harm is a recognised mechanism that links data to improved care. Building collaborative capacity to transform existing units with emerging self-harm clinical registry capability into a network of sentinel units would enhance existing self-harm surveillance and be a concrete step in building sector capability for a hospital-treated self-harm clinical quality registry.

Hospital-treated self-harm: A public health priority

Self-harm usually occurs in the context of psychological distress and is frequently directly associated with suicidal intent, psychosocial stressors and for many, mental ill-health. It includes behaviour across a spectrum of potential lethality.

Each year in Australia, self-harm accounts for more than 30,000 hospital admissions and nearly 90,000 bed days (Australian Institute of Health and Welfare [AIHW], 2019); with a conservative estimated cost to the economy of \$1.4 billion annually (Productivity Commission, 2020).

While only a minority of self-harm comes to the attention of health services, hospital-treated self-harm typically involves methods that can be medically serious and require an acute response; intentional overdoses account for the majority of hospital-treated self-harm admissions (approximately 80%) followed by cutting (12%), hanging (3%) and other means (AIHW, 2021).

Over the past 10 years, rates of hospital-treated self-harm have risen by 1.7% each year (AIHW, 2019), with the trend forecast to continue (AIHW, 2019). An additional spike in presentations by young people, specifically young females, has been seen in the wake of the pandemic (Sara et al., 2022).

At least 15% of hospital self-harm presentations re-present with further self-harm within a year of the initial presentation (Carroll et al., 2014). Hospital-treated self-harm is also the strongest independent risk factor for later suicide (Carroll et al., 2014; Owens et al., 2002), with one out of 25 self-harm presentations going on to die by suicide within 10 years (Carroll et al., 2014).

Suicide is the third leading cause of years of life lost in Australia; the leading cause of death for adults 15-44 years and the fifteenth leading cause of death overall (ABS, 2021). Of those who die by suicide, at least one-fifth have a history of self-harm (ABS, 2021) and less than half were linked in with mental health services in the year before their death (Stene-Larsen and Reneflot, 2019; Sveticic et al., 2012).

Hospital-treated self-harm in Australia: Patient profile (AIHW, 2021)

- More women than men present to hospital after self-harm (at a ratio of 2:1).
- People under 25 years account for 37% of self-harm admissions.
- Hospital-treated self-harm rates are highest for those living in very remote areas (198 vs 101 per 100,000 in major cities).
- Rates of hospital-treated self-harm for Aboriginal and Torres Strait Islander people are about triple those for the non-Indigenous population (348 vs 104 per 100,000).

People who present to hospital after self-harm should receive a holistic psychosocial mental health assessment. People should also be referred and linked into psychological, psychosocial and medical services and supports to address the suicidality and modifiable risk factors (Carter et al., 2016).

Interactions should be respectful, compassionate and collaborative (Carter et al., 2016). While these are all indicators of good practice, in Australia, we do not know how frequently they occur. Data about the nature of care and outcomes for people presenting to health services is required to ensure good care is delivered routinely.

Ensuring patients have a positive treatment experience and are connected, the first time they present to hospital, with the supports they need to stay well, across community, outpatient and private health and psychosocial services, is essential to effectively managing self-harm and improving health outcomes.

Care for self-harm must be aligned with best practice

In Australia, routine care for self-harm and suicidal crisis is not consistently aligned with best practice (Box 1) or meeting patients' needs (National Suicide Prevention Adviser, 2020a). Poor care results in extended recovery timeframes, contributes to poorer recovery outcomes and continues a cycle of crisis-driven contacts (National Suicide Prevention Adviser, 2020b).

Box 1. Australian self-harm clinical practice guidelines

Clinical practice guideline for the management of deliberate self-harm

Royal Australian and New Zealand College of Psychiatrists- Carter et al., (2016)

Guidelines for integrated suicide-related crisis and follow-up care in Emergency Departments and other acute settings

Black Dog Institute- Hill et al., (2017)

Guidelines for best practice psychosocial assessment of Aboriginal and Torres Strait Islander people presenting to hospital with self-harm and suicidal thoughts

Centre for Best Practice in Aboriginal and Torres Strait Islander Suicide Prevention, Menzies School of Health Research- Leckning et al., (2019)

Negative experiences of hospital care for self-harm and suicidal-related crises are common.

In 2020, the National Mental Health Commission's *Compassion First* report examined the lived experience of 2,000 Australians who had been suicidal or self-harmed, cared for a suicidal person or who had been bereaved by suicide (National Suicide Prevention Adviser, 2020a). The report highlighted issues with the care system that led participants to feel "disempowered, dehumanised and traumatised through contact with traditional services" (National Suicide Prevention Adviser, 2020a).

Participants spoke of experiencing stigmatising, judgemental and invalidating responses when presenting to health services for help; with many identifying that they were unlikely to seek future help for suicidal distress or self-harm based on these experiences.

In 2018, a small study of 20 patients who had presented to hospital after a suicide attempt were interviewed about the care they had received (McKay & Shand, 2018). A key theme across discussions was how participants described receiving good care as a result of “luck” and “advocacy”, rather than as a result of service or system design (McKay & Shand, 2018).

In 2017, a linked cohort study of over 42,000 patients who had been admitted to hospital for self-harm found that less than half had any contact with a public mental health service after discharge. Further, being seen by a public mental health service after discharge was most likely to occur for those who were already receiving support from mental health services prior to the admission (Spittal et al., 2017); highlighting that contact with hospitals for self-harm does not consistently lead to people being linked into new mental health support.

Over two decades ago, as part of the 1997 Australian Mental Health and Wellbeing Survey in which over 10,000 people participated, those who identified being suicidal or had attempted suicide in the previous 12 months most commonly identified their treatment needs as being for counselling, medication and information. However, these treatment needs were indicated as only being partially met even when people were in contact with health services (Pirkis, Burgess, Meadows, & Dunt, 2001).

These studies highlight a consistent and long pattern whereby routine care has missed opportunities to deliver support that meets people’s needs and which addresses the drivers of self-harm; indicating that good care is not being ‘built into’ the service system.

To improve health outcomes, reliable data within an infrastructure that drives improvements in care and service redesign is required.

Hospital-treated self-harm data is not fit for purpose of improving care

Hospital-treated self-harm data is not fit for the purpose of driving improvement in care at a service level (Suicide Prevention Australia, 2021). This is a consequence of:

- Current surveillance mechanisms which undercount the number of cases.
- Hospital-treated self-harm presentation data that is not linked to outcome data.
- Practice-focused translation mechanisms for service improvements absent from self-harm surveillance data and reporting mechanisms.

Self-harm surveillance

In Australia, self-harm surveillance¹ relies on data extraction from records designed for clinical care purposes. Specifically, clinical health records managed by hospitals, rather than data or record systems designed for surveillance or improvement objectives (AIHW, 2021). This limits the scope of what can be monitored and results in data that is vulnerable to gaps in documentation and coding inaccuracies (AIHW, 2021), which leads to significant undercounting (Box 2).

Box 2: Self-harm surveillance undercounting (Carter et al., 2016; Currier et al., 2020)

The consequence of self-harm surveillance undercounting means it is difficult to:

- Tailor service delivery and resources to meet local needs.
- Proactively target service delivery to address emerging trends.
- Monitor the effectiveness of service delivery on outcomes such as re-presentations.
- Identify whether changes in local self-harm rates reflect true changes in the number of self-harm and related hospital presentations or reflect changes in local clinical admission practices.
- Identify the demand for, or impact of, service delivery for people who are suicidal, which reflects a much larger group than those presenting after self-harm

Clinical coding

The use of data from medical records skews surveillance reporting to only those variables routinely captured in clinical records (Khan et al., 2016). This is narrowed further by the clinical coding system of the day, which is used to translate information about diagnosis and intervention from the patient's clinical record into alphanumeric codes (for example, ICD-10-AM; WHO, 2018). Consequently, if clinical reporting in health records is not clearly or accurately documented, or descriptions do not fall within the specifications of the coding system, it is not possible to build an accurate history of patient characteristics, presenting problems or associated service delivery.

¹ publicly available hospital-treated self-harm data reports released by AIHW. See: [Suicide and Self-Harm Monitoring System](#)

In Australia, coding of mental health presentations draws from individual clinician assessments and non-standardised documentation, rather than from objective forms of clinical data such as a pathology test. The lack of standardisation in assessment and documentation contributes to the likelihood that important patient information will be missing in medical records and consequently, surveillance reports.

The number of presentations to hospital for suicidal crisis (without self-harm) is also unclear. This is exacerbated by the current clinical coding system (ICD-10-AM; WHO, 2018), which treats suicidal intent as a secondary descriptor only (for example, self-harm with suicidal intent), and means suicidal intent can only be coded as an independent presenting issue when there is no underlying mental disorder (McCarthy et al., 2021). It has been suggested that, in Australia, suicidal presentations to hospital account for more than double the number presenting with self-harm (Sveticic et al., 2020). Transitioning to ICD-11 or use of other coding systems (e.g. Emergency Care Data Set- SNOMED codes) have greater capacity for accurate coding of suicidal intent.

Data capture rules

Issues of undercounting are also amplified by the data capture 'rules' used for self-harm surveillance. For example, self-harm surveillance data is drawn from the National Hospital Morbidity Database (AIHW, 2021). This database captures episode-level demographic, clinical and service delivery details, as drawn from electronic health records and reported by all hospitals (via state/territory counterparts) as part of the [National Minimum Data Set for Admitted Patients Care](#).

Self-harm surveillance is monitored by extracting admissions that satisfy the criteria of:

- A principal diagnosis of injury, poisoning and certain other consequences of external causes
- A first reported external cause code with external causes of morbidity.

Critically, this means presentations not included in self-harm surveillance data capture include those that (AIHW, 2021):

- Did not result in a hospital admission. For example, Emergency Department presentations where patients were discharged directly home.
- Did not have an external injury (external cause of morbidity) code; this is common for external injury presentations (McKenzie et al., 2009; Sveticic et al., 2020).
- Were for suicidal crisis, but which did not involve self-harm or a suicide attempt.

The proportion of cases not captured in routine surveillance is significant. As a result of surveillance only including self-harm presentations resulting in admission and reliance on 'external injury' codes, more than 30% of self-harm hospital presentations (McGill et al., 2019) and at least 40% of self-harm cases are not included or missed in routine surveillance (Bandara et al., 2022; Sperandei et al., 2021; Sveticic et al., 2020).

Addressing surveillance improvements

Improving access to accurate and relevant data has been identified by the suicide prevention sector, including hospitals and health services, as a priority (Suicide Prevention Australia, 2021). In a 2020 survey of 296 respondents, nearly all (96%) identified access to reliable, accurate suicide prevention-relevant data as being critical for service planning and responsiveness; while less than one-quarter (23%) indicated they had access to the data they needed (Suicide Prevention Australia, 2021). Most (79%) reported there were gaps in data collection systems for suicide prevention and further indicated they would benefit from access to real-time data on Emergency Department presentations (72%). Respondents also identified the lack of consistent coding for suicidal and self-harm behaviours across agencies was specifically problematic (Suicide Prevention Australia, 2021).

The need for accurate self-harm and suicide prevention data across agencies highlight systemic issues that require a sector response, rather than siloed responses at the individual service level. Improving the accuracy and expanding the scope of reported data will make self-harm surveillance data more useful by ensuring that service planning, modelling and evaluation can be conducted using accurate and broader indicators of demand and service use.

To accurately identify all self-harm and suicide-related presentations, significant local resources are required to support effective surveillance and accurate data capture. While some sites (e.g. Victorian self-harm surveillance system, Westmead hospital, Gold Coast Mental Health Specialist Services) have invested in establishing more accurate means of self-harm monitoring (Box 3), support for improvements in self-harm surveillance should be made more broadly at a national level.

Box 3: Tools to assist self-harm monitoring

Machine learning: has demonstrated potential capability to accurately identify self-harm and suicide-related presentations by coding text within the presenting problems field within medical records. This option also reduces demands for manual coding (Stapelberg et al., 2021b; Rozova et al., 2022). However, scalability is still to be demonstrated

Self-harm or suicide prevention ‘flags’ within electronic health records can also be used to improve data capture. For example, at Westmead hospital, the introduction of an electronic health record ‘flag’ that clinicians would tick when they saw a person who had self-harmed saw a two-fold increase in identification of self-harm cases, compared to use of diagnostic coding only (Bandara et al., 2022).

Linking surveillance data with outcomes data

Linking self-harm surveillance data to health outcome data enables effective service planning, allowing data to be used to evaluate the effectiveness of services, and to examine the uptake of treatments and the impact of interventions. Key outcomes relevant to individuals, services and policy goals include self-harm re-presentations and suicide deaths.

In Australia, hospital self-harm surveillance data is not routinely linked with outcomes data, hampering effective evaluation of service delivery and suicide prevention initiatives, including those funded by governments (Currier et al., 2020). Instead, outcomes evaluation is usually limited to

process or activity indicators only. This reduces the potential to understand whether or not the introduction of a service has decreased hospital re-admissions for self-harm or suicide deaths in a region (Currier et al., 2020). It has also meant that evaluation of the outcomes for self-harm treatment and service delivery effectiveness is reliant on local service investment or independent research studies, rather than being part of routine service delivery.

The absence of data linkage also limits the frequency of which services are able to examine the impact of care (Mental Health Information Strategy Standing Committee, 2019), with evaluation occurring in a one-off or ad hoc manner, rather than as part of a program of continuous improvement (Productivity Commission, 2020).

To address these issues, routine outcome monitoring linked to existing surveillance data should be established at the service level in order to provide local services with the capability to monitor the impact of their care. This would also allow, through modelling, examination of the best combination of interventions to deliver reduced deaths and fewer repeat self-harm events (e.g. Occhipinti et al., 2021), and allow governments to monitor the impact of investments in suicide prevention on intended outcomes.

Reporting surveillance data at the person-level (not just episode-level) would provide an indication of re-presentation rates and allow for comparisons with the existing evidence base (e.g. Carroll et al., 2014) and benchmarking. Routine data linkage between existing surveillance for self-harm with morbidity datasets would also allow monitoring of the proportion of patients who have died by suicide after presentation to hospital for self-harm.

Patient reported outcomes

Suicidal ideation and self-harm behaviour are specific outcomes for which there are recognised patient reported outcomes measures (PROMs), as identified through the International Consortium for Health Outcomes Measurement (ICHOM) data sets (Personality Disorder, Depression and anxiety for children and young people data sets; ICHOM, 2020).

However, in Australia, PROMs for hospital treated self-harm and suicide have not been routinely implemented. This means that there is no available or shared way of identifying whether care is improving these outcomes. Patient reported experience measures (PREMs) are also not reported specifically for the subgroup of patients presenting after self-harm, which similarly means there is no way of monitoring whether patients have experienced care as being helpful or not.

Including PROMs and PREMs in addition to outcomes that can be drawn from data linkage with existing datasets (e.g. re-presentations, suicides) will ensure that ineffective or substandard care can be identified and addressed. While the ICHOM measures provide a starting point for PROMS, further work is required to establish whether these outcomes best reflect patients' perspectives about which outcomes should be monitored.

Case Study 1: Way Back Support Service Evaluations

The Way Back Support Service is an innovative service designed to provide non-clinical support to people for three months after a suicide attempt or suicidal crisis. Beyond Blue have led the development and dissemination of the service. Evaluation has been part of each roll-out phase.

A [proof of concept pilot](#) (EY, 2016) was conducted in Darwin (Northern Territory; EY, 2016). 87 people received support through the service in a one-year trial. The pilot established the service model was appropriate and feasible to deliver.

A [larger trial in Newcastle](#) (New South Wales; Carter et al., 2019) resulted in 970 people being supported by the service over a three year period. This trial concluded that the service was feasible to deliver and that clients who remained engaged with the program made progress towards goals and reported reduced psychological distress.

However, a [non-randomised efficacy trial](#) for the same cohort also showed that there were no differences in proportion or number of deliberate self-poisoning readmissions for the intervention cohort (who were all offered the WBSS; n=821) compared to two historical control cohorts (n=739; n=710); and the intervention cohort had significantly more psychiatric inpatient admissions than one of the historical cohorts (McGill et al., 2022). It was recommended the model of care be modified to incorporate evidence-based clinical components and ways to increase reach be considered.

The Way Back Support Service has since been established in [21 sites across Australia](#) with over 7,000 referrals in three years (Nous, 2021). For clients for whom patient reported outcomes measures were available (less than half of all referrals), significant improvements in wellbeing and reductions in psychological distress and suicidal thinking have been reported.

The Way Back Support Service demonstrates the importance of capturing both patient reported outcomes (e.g. psychological distress) in conjunction with 'hard' outcomes like re-admissions (or suicide deaths).

Roll-out of universal aftercare (which will include continued delivery of the Way Back Support Service) should incorporate monitoring of both patient reported outcomes and impacts on re-admissions and deaths to ensure the service delivers on intended outcomes.

In the United Kingdom, a qualitative study of 18 people with a history of self-harm identified that the most important outcomes to monitor were those relevant to daily functioning, social participation and engagement with services (Owens et al., 2020). A second study, conducted in New Zealand and the United Kingdom, involving 28 young people identified 'improved coping' and a 'safer/more accepting environment to disclose' as the most important outcomes to capture within systematic reviews of treatment effectiveness (Knowles et al., 2022). These participants specifically identified 'reduction of self-harm' as a low priority (Knowles et al., 2022). Other treatment proximal indicators, typically used in treatment efficacy studies, include improvements in quality of life and reduction in psychological distress (House, 2020).

In Australia, the National Suicide Prevention Adviser has recommended that a national outcomes framework for suicide prevention be developed and informed by lived experience (Department of Health, 2020a). Delivery of this framework should be supported and consideration given to using a value-based healthcare approach, co-designed between patients and service providers, to ensure outcome measurement goes beyond monitoring only of traditional clinical indicators to include those that are meaningful to the patient (Woolcock, 2019).

Identifying such indicators would support service providers and clinicians to design and deliver care models that achieve the outcomes that matter to people and communities, that reflect high quality, efficient and safe treatment, and ensure clinical data could be used to inform improvements in performance through all levels of the health system.

Transforming care through practice translation

In Australia, translating data on hospital treated self-harm care and care outcomes is critical to the provision and delivery of safe, transparent, effective and efficient services. Yet, tools, processes and strategies that support data translation are absent meaning that even when data is available, it is not necessarily used for the purpose of improving care.

Service quality indicators and standards

Service quality standards are one tool that can be used to standardise care through monitoring of key components of care. However, in Australia, service quality standards specifically for self-harm and associated performance indicators of effective care are lacking. Consequently, service improvement efforts rely on local translations of priorities and guidelines, precluding benchmarking for quality assurance and improvement purposes.

Nevertheless, aspects of care are known to underpin good outcomes following self-harm, despite the absence of standards. For example, psychosocial assessment for those presenting to hospital for the treatment of self-harm is associated with reduced risk of self-harm repetition (Kapur et al., 2013; Carroll et al., 2016), particularly for first-time presenters (Bergen et al., 2010). However, psychosocial assessment is also an aspect of care that does not consistently occur.

In the United Kingdom (UK), in a study of 32 hospitals, the proportion of patients presenting for self-harm who received a psychosocial assessment across hospitals ranged from 22-88% (Cooper et al., 2013). Similar variability (17-97%) was described in a study of all hospitals within the Republic of Ireland (Griffin et al., 2020), which identified that the hospital a person presented to be the strongest predictor, by far, of whether a patient received an assessment (more than patient-level characteristics). A similar study is unable to be conducted in Australia due to the lack of data infrastructure.

These studies highlight the degree to which local models of care can determine whether patients receive care aligned with best practice. Quality standards for comprehensive psychosocial assessments have since been introduced in the UK that require an assessment to be carried out each time a person presents with an episode of self-harm (NICE, 2013).

In Australia, the National Mental Health Performance Framework (AIHW, 2020a) in combination with the standards outlined by the Australian Commission on Quality and Safety in Healthcare (ACSQHC, 2017) could be used, as a first step, as a framework to develop service quality indicators.

Learning health systems: Audit, feedback loops and benchmarking

Data is most likely to be used for practice change when audit and feedback loops are used. Once outcomes data have been linked with AIHW surveillance data or data that monitors service quality, audit and feedback loops should be used to link available data to local practice change.

Audit and feedback loops are particularly powerful when reported data relates to strategic goals (Hill et al., 2020; Foy et al., 2020), when it is perceived to be of high quality and useful (Egholm et al., 2019) and if there is benchmarking capability, identification of an evidence-practice gap or clinical practice improvement training is available (Gawthorne et al., 2021).

Establishing feedback mechanisms provide the foundation for a learning health system. A learning health system refers to a health service that uses the data available to monitor and improve care (Enticott, Johnson & Teede, 2021a). Learning health services continuously draw from routinely collected health care data and have inclusive feedback loops to local stakeholders that allow for continuous quality improvement, particularly in the area of high priority and complex presenting issues (Enticott et al., 2021b).

Coupling local participation and commitment with audit and feedback loops enable strategies and capabilities to be embedded within health services in a systemic manner, rather than a time or project limited fashion (see Figure 1; Easterling et al., 2021). This approach should be adopted more broadly.

Collaborative learning networks

Collaborative learning actively engages participants to process and synthesise information and concepts and provides infrastructure for longer term support of improvement efforts (Seid et al., 2021; Weaver et al., 2015). Mentoring and peer learning opportunities through collaborative learning networks have shown promise in ensuring access to data translates into practice change and better patient outcomes (Loper et al., 2021; Slade et al., 2018; Vindrola-Padros et al., 2017; Wells et al., 2017; Zamboni et al., 2020). In Australia, collaborative learning networks are uncommon, but could be implemented together with strategies for better self-harm data to ensure learnings and best practices are shared across sites, to reduce inefficiencies in improvement cycles and to strengthen relationships that allow collaboration (e.g. benchmarking, innovation development and testing) in the future.

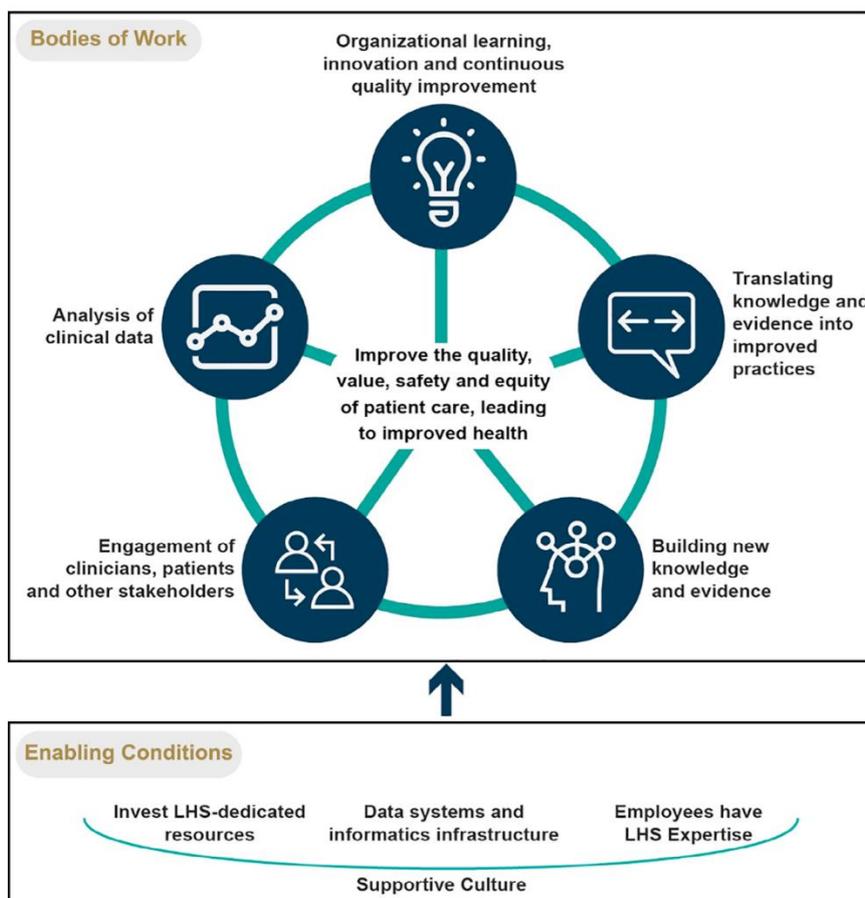


Figure 1: Key enabling conditions and ways data is used in Learning Health Systems (LHS) (Easterling, 2021).

Support for the development and implementation of practice translation strategies would enhance existing local capability to use data to improve care. Identifying key PROMs and PREMs that could be embedded within routine care and developing service quality indicators would provide services a standard to compare care with and would allow benchmarking to be established. The National Suicide Prevention Office and Australian Commission for Safety and Quality in Health Care could lead the required development work in partnership.

Linking AIHW surveillance data with existing outcomes-relevant data (e.g., re-presentations, suicides) and subsequently incorporating other outcomes-relevant data (e.g., PROMs, PREMs) and service quality indicator monitoring into surveillance platforms would provide health services with the data required to improve care. Coupling improvements in accessibility to relevant data with evidence-based quality improvement techniques (such as audit and feedback, embedded researchers or mentors, collaborative learning networks) led by a central group (e.g., AIHW, ACSQHC, National Suicide Prevention Office) would also build capability for services to use available data to improve care and ideally to establish suicide prevention learning health systems.

Case study 2: Gold Coast Mental Health Specialist Services and Zero Suicides

Gold Coast Mental Health Specialist Services has used data to improve the care to people who are suicidal, demonstrating what a learning health system for suicide prevention can look like.

Specifically, the service draws from data stored in the clinical record to:

- identify suicidal and self-harming patients
- track the nature of service delivery for those on the pathway
- examine and demonstrate the impact of their care for people who were suicidal
- populate real-time feedback loops to support service delivery

Suicide prevention care pathway effectiveness

In 2016, in an effort to improve care for people who were suicidal, the Gold Coast Mental Health Specialist Services introduced a Suicide Prevention Pathway for clients presenting in a suicidal crisis to hospital or the Mental Health Service (Turner et al., 2021).

Evaluation found that people being placed on the Suicide Prevention Pathway following a suicide attempt had a 35% reduced risk of re-presenting with a subsequent attempt compared to those not placed on the pathway (Stapelberg et al., 2021a).

Patients on the pathway received a mental health assessment, prevention-oriented risk formulation, brief interventions (including safety planning, counselling on access to lethal means, and patient and care education), rapid follow-up after discharge from hospital (within 48 hours), structured follow-up assessing suicidality and treatment fit, and transition of care including warm handovers.

Required data infrastructure

Data enhancements that enabled the pathway to operate included:

- introduction of a Suicide Prevention Pathway 'flag' in the electronic health record,
- introduction of a feedback loop for key performance indicators, using data drawn from the clinical record
- dedicated human resources to coordinate data monitoring
- local leadership and commitment to Zero Suicides in health care

Clinical registries for self-harm

While significant progress has been made in Australia to establish suicide registries within each jurisdiction (AIHW, 2022a), there are no national mental health or self-harm clinical registries listed on the ACSQHC clinical quality register (ACSQHC, 2022). Instead, self-harm surveillance and monitoring is restricted to data reported by AIHW. Consequently, there is no strategic independent mechanism via which the sector can address self-harm data limitations, including definitional issues and data harmonisation, and no centralised mechanism to drive the use of self-harm data to improve care at the local level.

Self-harm versus suicide clinical registries

While complementary, self-harm registries differ from suicide registries in a number of ways; including different target populations, data sources and different ways the data can be used (see Table 1). Self-harm registries have capacity to inform and improve the care delivered to those at risk of suicide (Witt & Robinson, 2021), and thereby act as a mechanism to both limit the burden of the ill-health in the short term and potentially the number of years lost to suicide. Hospital-treated self-harm registries represent an important investment in building capacity to improve service delivery and should be prioritised.

The absence of a self-harm registry is despite mental health conditions, including suicide and self-harm, meeting the burden of disease criteria used to assess whether investment in clinical quality registry establishment is justified (ACSQHC, 2016). In 2016, due to poor existing data capture mechanisms and limited collaborative capability across stakeholders, ACSQHC identified that mental health, as an overarching condition, was not ready for registry establishment (ACSQHC, 2016). Instead, it was recommended that registry-readiness for mental health be developed by focusing on specific subgroups of patients (ACSQHC, 2016).

Absence of a registry for hospital-treated self-harm means surveillance relies on inaccurate data that is limited in scope. It also means there is no centralised quality assurance data infrastructure for health services, meaning service improvement is dependent on local investment and capability. Development of clinical registry capability for hospital-treated self-harm could be supported by building collaborative mechanisms between sites with emerging registry capacity.

Table 1: Hospital-treated self-harm vs suicide registries

	Hospital-treated self-harm clinical quality registry	Suicide registry
Condition	Self-harm hospital presentations	Suicides
Approximate size of population	30,000+ admissions per year (AIHW, 2022b)	3,000+ deaths each year (AIHW, 2022c)
Data	Drawn from hospital medical records (AIHW, 2022d)	Drawn from coroners' reports (which use police and other information referred to them) (AIHW, 2022e)
Initial data custodians	Hospitals (AIHW, 2022d)	Coroners (AIHW, 2022e)
Use of data	<p>To improve care through feedback loops to local hospitals and benchmarking</p> <p>To inform service planning and resource allocation</p> <p>To identify priority populations and groups missing in treatment settings</p> <p>To evaluate the impact of new ways of working or innovations</p> <p>To evaluate the impact of public health suicide prevention efforts (Department of Health, 2020b)</p>	<p>To identify emerging trends and clusters and enable proactive postvention responses</p> <p>To evaluate the impact of public health suicide prevention efforts (AIHW, 2022a)</p>

Sector capability for a self-harm clinical quality registry

National strategic efforts to scope or develop sector capability in the area of clinical quality registries for hospital-treated self-harm have been publicly absent to date, with no mechanisms available to build or test sector registry capability for this health condition. While this can suggest that the existing data and practice translation infrastructure is sufficient for improving care, ongoing issues with variability in care suggest otherwise (National Suicide Prevention Adviser, 2020a).

Development of a clinical quality registry is complex and requires dedicated review of the feasibility and potential value of a registry as relevant to the specific health condition of interest. In this regard, in 2021, ACSQHC developed a business case template to assist stakeholders work through the

components required to assess the viability of establishing a clinical quality registry (ACSQHC, 2021). To date, this process has not been undertaken for hospital-treated self-harm.

There is also a lack of collaborative mechanisms to enable units who are leading in innovative self-harm monitoring and with emerging clinical registry capability, to work together. This means opportunities to leverage from and scale local work to improve self-harm data are missed, including opportunities to build the sector's registry capability.

Units with emerging or potential registry capability proactively engaged in improved or innovative means of hospital-treated self-harm monitoring include Calvary Mater Newcastle (Hunter Area Toxicology Service), University of Melbourne (Victorian self-harm surveillance system), Western Sydney University (Westmead hospital) and Gold Coast Mental Health Specialist Services (Gold Coast Health). Despite functional similarities, these units have significant differences in data capture mechanisms, population scope, funding mechanisms and auspicing organisations (see Appendix A) meaning that the work they do and data they collect is siloed.

For example, data capture and monitoring for Gold Coast Mental Health Specialist Services and Hunter Area Toxicology Service (Calvary Mater Newcastle) are led by and embedded within clinical service provision, while the Victorian self-harm surveillance system and data from Westmead hospital are managed through a partnership between health services and universities. Despite units holding accurate, reliable and detailed data, data definitions, coding and data extraction methods remain site-specific and the lack of common data standards/data dictionaries continue to perpetuate information silos. This results in:

- an inability to use the collective data to address policy-relevant questions and concerns;
- missed opportunities to improve hospital-treated self-harm data coding and capture across the sector, including information to inform scalability; and
- potential demonstration sites for centralised hospital-treated self-harm clinical registry are not being identified or utilised.

Efforts to transform existing units into a collaborative network of hospital-treated self-harm sentinel units should be made by supporting the establishment of processes and resources required to institute collaboration, data harmonisation and interoperability between the units. A collaborative network of sentinel units would not only strengthen and complement existing surveillance mechanisms, these units would also be well-placed to trial benchmarking processes and to investigate the impact of innovation in the health system around self-harm prevention.

Case Study 3: Calvary Mater Newcastle Deliberate Self-Poisoning Clinical Registry

Since 1987, the Hunter Area Toxicology Service (HATS) has provided a comprehensive 24 hours/day toxicology treatment service in the Hunter region (NSW, Australia). Based at the Calvary Mater Newcastle Hospital, the service provides clinical care to poisoning patients in the Greater Newcastle region. The local service model ensures all poisoning patients within the region are transported to and/or admitted under HATS, regardless of the complexity of poisoning (Whyte et al., 1997) and a standard preformatted assessment schedule is used to standardise care and clinical reporting (Buckley et al., 1999).

This data is used to maintain a poisoning (including deliberate self-poisoning) clinical registry, which is the only one of its kind in Australia. The registry stores data relevant to the ingestion, clinical presentation and mental health assessment of deliberate self-poisoning patients since 1997. The service model means the unit effectively functions as a deliberate self-poisoning surveillance sentinel unit. Use of person-level identifiers allows the data to be used to monitor outcomes such as re-admissions and provides capacity for data linkage.

Use and impact of deliberate self-poisoning clinical registry data

Surveillance: The clinical registry data has been used to examine whether an increase in deliberate self-poisoning was evident in local data for the period 2003-2012, as seen at the state and national level. The increase was not apparent locally and findings provided an estimate of the magnitude of official surveillance under-reporting (McGill et al., 2019). These findings were used by the Hunter New England Central Coast Primary Health Network for local service planning.

Service improvement: The clinical registry data was used to examine the differences in clinical management as associated with patients' Indigeneity. It was identified that Aboriginal patients presenting after deliberate self-poisoning were significantly less likely to be referred to the psychiatric inpatient unit for admission compared to non-Aboriginal patients (McGill et al., nd).

Innovation: The clinical registry data has also been used to examine the effectiveness of the introduction of a new aftercare service (the Way Back Support Service) on deliberate self-poisoning repetition, comparing the intervention cohort with two historical control cohorts. No difference in repetition rates were found and the intervention group had more psychiatric inpatient admissions than one of the control cohorts in the twelve-month follow-up period (McGill et al., 2022). These findings have informed the national roll out and evaluation of the Way Back Support Service program.

Policy into practice: The NSW Accredited Persons program extended the Mental Health Act responsibilities and allowed appropriately credentialed health workers to require a person to attend an involuntary mental health assessment, similar to responsibilities previously only held by Medical Officers. Clinical registry data showed that, after presentation complexity was taken into account, there were no differences in proportion of patients sent for an involuntary mental health assessments based on clinician type (Accredited Person v Medical Officer) (McGill et al., 2021). The local health service is now considering expanding the Accredited Persons program within the district.

Other clinical (quality) registries

Clinical quality registries and collaborative networks of hospital-treated self-harm monitoring units, have been or are being established internationally, including in the United Kingdom (UK), the Republic of Ireland and Sri Lanka (Hawton et al., 2007; Griffin et al., 2019; Knipe et al., 2019).

Data obtained from units in the UK and Republic of Ireland have been used for policy and service planning, including (Witt & Robinson, 2021):

- Identifying priority population subgroups and tracking outcomes for these groups over time.
- evaluating the impact of introducing clinical practice guidelines.
- Comparing the impact of different clinical management patterns on outcomes (including self-harm repetition and suicide).
- Identifying geographic areas requiring additional resources.

These activities have been facilitated by capacity to link and pool data across units, strong collaboration between stakeholders and sustained investment in hospital-treated self-harm monitoring (Witt & Robinson, 2021). A similar model should be adopted for use in Australia, but with incorporated capacity for service-level audit, feedback mechanisms and benchmarking capability.

Clinical registries have also been used to improve care at the local level both internationally and in Australia for conditions other than self-harm. For example:

A suicide registry managed by the UK's *National Confidential Inquiry into Suicide and Safety in Mental Health* (NCISH) has been used to develop service-focused quality indicators and recommendations (e.g., Figure 2; NCISH, 2022).

Figure 2: The UK's National Confidential Inquiry into Suicide and Safety in Mental Health service quality indicators for hospitals, developed from suicide registry information (NCISH, 2022)



The Australasian Electronic Persistent Pain Outcomes Collaboration (ePPOC) has established a minimum dataset for pain services that includes patient-reported outcomes measures (PROMs). These measures have been integrated into usual care by participating services and data collection is managed by a centralised system. Providing real-time feedback at the patient-clinician level, data is used to inform care and decision making at the individual level (AHSRI, 2020).

The Australian Dementia Network (ADNet) collates clinical data from participating services, and provides feedback and benchmarking for memory clinic and dementia diagnostic services across Australia (Lin et al., 2020). ADNet has also partnered to enable comprehensive data linkage and to connect patients with relevant research trials (ADNet, nd). ADNet data will be used to inform and monitor progress for aged care reforms (as outlined by the Royal Commission into Aged Care Quality and Safety) and build the evidence base for dementia and best practice (AIHW, 2020b; Cations et al., 2021).

More broadly, Monash University hosts and supports multiple [clinical registries](#) with a framework that could be used to guide the establishment of a registry for self-harm.

Establishing national infrastructure that links clinical data to practice is essential to build quality assurance capability at a sector level; which will ensure the public health investment in self-harm surveillance improvements also translates into better care at the local level.

Conclusions and recommendations

Improving the care of, and outcomes for, people who have self-harmed is an important suicide prevention objective. In particular, there is pressing need to improve people's experience of hospital care after self-harm, and to increase connection to community aftercare.

While there has been progress in the accessibility and availability of hospital-treated self-harm data, efforts have not been designed with the primary purpose of enabling service and clinical practice improvement. To ensure available data can be used to improve practice, efforts should be taken to improve the accuracy and scope of hospital-treated self-harm data, to link presentation (surveillance) data with outcomes data, and to introduce practice translation supports including audit and feedback loops and coaching and peer learning opportunities.

A clinical quality registry is an ideal form of data infrastructure that links data to practice. Mental health sector registry capability could be developed by focusing on hospital-treated self-harm in the first instance. Transforming existing units with emerging registry capability into a collaborative network of sentinel units is one way to enhance existing self-harm surveillance and a concrete way to build sector registry capability. Delivering these sorts of data infrastructure will create a national quality assurance infrastructure that will help ensure that public health investment in self-harm surveillance improvements translates into better care at the local level.

Improve the accuracy and scope of hospital-treated self-harm surveillance data

The accuracy and scope of self-harm surveillance data is critical for service planning, including to ensure services can resource adequately for demand and to tailor and design services to meet priority population needs. Hospital-treated self-harm surveillance data can be improved by:

- Hospitals introducing self-harm or associated flags within the medical record system to improve ease of data capture and coding.
- Hospitals transitioning to use of ICD-11 for diagnostic coding (where the taxonomy of coding of suicidal intent is improved) as soon as possible.
- Government investment in development and testing of automated extraction tools (where free text responses in presenting problems or similar fields can be used to identify self-harm cases), with a view to scaling as a national surveillance tool when appropriate.

Pending improvements in coding, surveillance can be improved by:

- AIHW broadening routine surveillance data capture to include Emergency Department self-harm presentations, in addition to admissions.
- AIHW expanding surveillance data capture to include presentations associated with suicidal intent, not just self-harm.

Link self-harm presentation surveillance data with outcomes data

Hospital care for self-harm in Australia is variable and negative experiences are reported frequently. Improvements in care and outcomes will require reform for value-based health care that includes the routine collection and monitoring of PREMs and PROMs. Key improvements include:

- AIHW expanding and enhancing hospital-treated self-harm surveillance reporting by including episode and person counts and rates at the hospital level (for example, 33,000 admissions by 28,000 patients).
- AIHW routinely linking self-harm surveillance data with suicide death data (within twelve months of self-harm presentation) and making this information available to hospitals at the hospital level.
- Departments of Health, supported by the National Suicide Prevention Office, to lead partnerships with people who have been in contact with hospitals after self-harm and health services to identify key patient-reported outcomes and experience measures that should be monitored as part of routine care.
- Support and resources made available for hospitals to embed administration of PROMs and PREMs into routine care.

Improve practice translation mechanisms

Delivering data infrastructure coupled with practice translation that provides capability for learning health systems should be prioritised. This includes:

- The ACSQHC and Departments of Health, with support from the National Suicide Prevention Office, partnering to develop service quality standards specific to self-harm, including identification of relevant performance indicators. These could then be used for benchmarking purposes.

Pending linking of surveillance and outcomes data and/or availability of service quality indicators, data availability should be paired with:

- Establishment by the data custodian of audit and feedback loops at the hospital level to support service improvement efforts.
- Government support to establish collaborative learning networks and translation opportunities and resources.

Develop and prioritise clinical quality registry capability for hospital-treated self-harm

Governments should commit to a strategic approach that transforms local leadership into sector-wide quality assurance infrastructure, by building clinical quality registry capability for hospital-treated self-harm. This includes:

- Development of a phased strategy to building clinical quality registry capability for hospital-treated self-harm. This will include mapping the sector's technical data strengths and weaknesses, a feasibility scoping review, a plan for building sector readiness within a specified timeframe, scoping and mapping of success features of other registries and development of a business case using the ACSQHC template. These activities should be effectively resourced and occur in a coordinated fashion in parallel with ongoing improvements in self-harm surveillance.
- Government should support and test feasibility of a collaborative network of sentinel units that could be used to build capacity and capability for a centralised clinical quality registry. Establishment of collaborative mechanisms that build capacity for data harmonisation, interoperability, data sharing and a shared purpose for units with emerging clinical registry capability would strengthen existing surveillance mechanisms and provide development and demonstration sites for practice translation mechanisms.

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Appendix A: Self-harm monitoring units with emerging registry capability

	Calvary Mater Newcastle Deliberate Self-Poisoning Clinical Registry	Gold Coast Mental Health Specialist Services- Zero Suicides Framework	Victorian self-harm monitoring system	Western Sydney- self-harm monitoring system
Primary purpose of register	To provide local surveillance of deliberate self-poisoning and to provide infrastructure to allow high quality service evaluation to occur	To support implementation of the Zero Suicides Care Pathway (a service improvement initiative). Including to <ul style="list-style-type: none"> • identify suicidal presentations to GCMHSS (following suicidal ideation or self-harm) and record placements on the Suicide Prevention Pathway • track the nature of service delivery for those on the Pathway including the fidelity to the Pathway • examine and demonstrate the impact of the Pathway on relevant outcomes. 	To improve access to high-quality and timely data in order to inform policy initiatives and real-time service responses; with a vision of a range of data sources (including emergency departments) to feed into the system	Initially established as part of the SMS SOS randomised control trial to assist with the identification of potential participants, but then continued as an ongoing flag in the electronic health record for monitoring and evaluation.
Location and referral catchment area	Greater Newcastle, New South Wales	Gold Coast, Queensland Approximately 600 000 in primary referral area	Eight public hospitals across the state of Victoria, including six in metropolitan Melbourne and two in regional Victoria.	Western Sydney Local Health District Approximately 946 000 in primary referral area.

	Approximately 360 000 population in primary referral area		Approximately in 3.5 million in primary referral area.	
Services involved	<p>One Emergency Department and private hospital.</p> <p>Note- the local service model means all poisoning patients within the Greater Newcastle region are directed to and admitted under the Hunter Area Toxicology Service which is located at this hospital.</p>	One large public mental health and drug and alcohol service, including 2 Emergency Departments and hospitals, and multiple community clinics.	Eight (of 38) public hospitals with 24-hour Emergency Departments	Westmead Hospital, Blacktown Hospital
Registry population	<p>Deliberate self-poisoning patients.</p> <p>Admitted to Calvary Mater Newcastle hospital, which provides toxicology services for the Hunter region.</p>	Suicidal presentations to Gold Coast Mental Health Specialist Services (following suicidal ideation or self-harm); who are then placed on the Suicide Prevention Pathway	Self-harm presentations to the Emergency Department	Self-harm presentations to the Emergency Department
Case ascertainment	All poisoning patients routinely admitted to this hospital. Deliberate self-poisoning assessment as determined by toxicologist and/or mental health clinician.	Suicidal presentations (including ideation and self-harm) are identified through Emergency Department data collections through review of relevant presenting problems, ICD-10 / SNOMED diagnoses, and	Natural language processing classifier is being developed to identify cases of self-harm based on free-text triage case notes.	Clinician assessment at time of presentation to Emergency Department

identification of keywords in triage texts.

Patients placed on Suicide Prevention Pathway (which only applies to those meeting eligibility criteria, as described in Turner et al., 2020) are identified through a specific 'alert' (or flag) placed by the assessing clinician in the electronic medical record.

Timeframe	1995- current	2016 - current	2012-2024	2018- current
Funding	Internal	Internal	Combination of philanthropic and Victorian state government funding	Grant funding (NSW Translational Health Research Grant)
Example reports/studies	<p>McGill et al. (2022). Effectiveness of the Hunter Way Back Support Service: An historical controlled trial of a brief non-clinical after-care program for hospital-treated deliberate self-poisoning. <i>Suicide and Life Threatening Behaviour</i>. 52(3), 500-514.</p> <p>McGill et al. (2019). Is the reported increase in young female hospital-treated</p>	<p>Stapelberg et al. (2021). Efficacy of the Zero Suicide framework in reducing recurrent suicide attempts: cross-sectional and time-to-recurrent-event analyses. <i>The British Journal of Psychiatry</i>. 219(2), 427-436.</p> <p>Stapelberg et al. (2021). Data mining of hospital suicidal and self-harm presentation records using a tailored evolutionary</p>	<p>Robinson et al. (2020). Development of a self-harm monitoring system for Victoria. <i>International Journal of Environmental Research and Public Health</i>. 17(24), 9385.</p> <p>Rozova et al. (2022) Detection of self-harm and suicidal ideation in emergency department triage notes. <i>Journal of the American</i></p>	<p>Stevens GJ et al. (2019) SMS SOS: a randomized controlled trial to reduce self-harm and suicide attempts using SMS text messaging. <i>BMC Psychiatry</i>. 19(1):1-7</p> <p>Bandara et al. (2022). Surveillance of hospital-presenting intentional self-harm in Western Sydney, Australia, during the implementation of a</p>

intentional self-harm real or artefactual? <i>Australian & New Zealand Journal of Psychiatry</i> . 53(7), 663-672.	algorithm. <i>Machine Learning with Applications</i> . 3, 100012.	<i>Medical Informatics Association</i> . 29(3), 472-480	new self-harm reporting field. <i>Crisis</i> .
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