Suicide and Self-harm

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150 word summary

Suicide and self-harm are major health and societal issues worldwide but the greatest burden of both occur in low- and middle-income countries. While rates of suicide are higher in males, self-harm is more common in females. Rather than having a single cause, suicide and self-harm are a result of a complex interplay of multiple factors which occur across the life course and may vary by gender, age, ethnicity and geography. A number of clinical and public health interventions show promise, although our understanding of effectiveness has largely originated from high income countries. Attemping to predict suicide is unlikely to be helpful. Intervention and prevention must include both a clinical and community focus and every health professional has a crucial role to play.
Introduction

Data from the World Health Organisation suggest that suicide accounts for at least 700,000 deaths per year globally. The actual number is likely to be much higher because of under-recording. Suicide has become a defining health and societal issue in many countries. Self-harm (self-poisoning or self-injury with varying degrees of suicidal intent) is even more common with an estimated 14.6 million individuals affected each year. Suicide has received a great deal of attention during the COVID19 pandemic and its prevention will continue to be a priority as we move into subsequent phases and eventual recovery.

Many people who die by suicide have a history of self-harm and previous self-harm is the strongest risk factor for suicide, at least in high income settings. Despite suicide and self-harm sometimes being seen as distinct phenomena here we will discuss them together given that many of the principles of intervention and prevention are common to both.

Suicide and self-harm are intensely individual experiences, often markers of unbearable psychological pain, but they occur in a societal context. For example, we have known for at least a century that economic adversity may be associated with suicide rates. So, is suicidal behaviour even an issue for health services? In fact, clinicians need to be at the forefront of suicide prevention efforts. While suicide and self-harm are not discrete disease entities, policymakers and the public will look for clinicians for leadership. This might be particularly the case in low- and middle-income countries (LMICs). There are the public health aspects which need to be recognised, but the role of mental and physical health also needs to be acknowledged - a proportion of people who die by suicide are suffering with a psychiatric disorder at the time of death and many, particularly in older age groups, have a physical illness. Most, at least in high income settings, will have consulted health services in the year before they die, some having harmed themselves. Each clinical encounter should be seen as an opportunity to intervene.
Stigma remains a significant issue in clinical and non-clinical settings and the language we use is important. Suicide may not be openly discussed or may even be perceived as a selfish act. Many people who self-harm have a poor experience of health care:

‘In many cases, staff lacked compassion. Such as invalidating my distress, stigmatising responses such as ‘wow you really meant to kill yourself, didn’t you!!’, exclaiming at the severity of my previous scarring and saying I was ‘adding to the collection’, saying that my pain threshold must be high and deciding not to give me any pain relief or medications when stitching or cleaning wounds (almost as if it was to be a punishment for self-harming), saying that I was ‘wasting time’ and other people had ‘real’ injuries’.

Patients report that clinicians may blame or deny them access to good quality care because of the erroneous belief that this will encourage future episodes. Such attitudes may be partly related to a lack of knowledge and understanding. Clinicians also need to be aware that some individuals view their self-harm as a coping strategy to manage psychological distress or even prevent suicide.

In this seminar we aim to provide an update on suicide and self-harm with a global and practical focus. We will also discuss current and emerging issues. Further discussion of the terminology used throughout the seminar and the importance of language are included in Appendix 1.
**Epidemiology**

**Suicide**

One person dies by suicide every 40 seconds\(^9\). For every person who dies, 60-135 people are affected by the death\(^10\). The global rate of suicide is estimated to be 9.4 per 100,000 (95% CI 8.5-10.3), with higher rates in males (13.3 per 100,000 95% CI 11.3-14.7) than females (5.7 per 100,000 95% CI 5.1-6.4)\(^2\). Possible explanations for higher male rates include methods of suicide (men may choose more dangerous methods with a higher case fatality), lack of help seeking, and clustering of risk factors (e.g. alcohol misuse)\(^11\). Suicide is the leading cause of death in 15–34-year-olds and rates generally increase with age. There are, however, some country specific exceptions (e.g. higher rates in middle age in the UK and young people in India\(^12\)).

The age-standardised suicide rate has decreased between 1990 and 2016, with some countries experiencing significant reductions (e.g., China: 64% decrease). Others, however, have observed substantial increases (e.g. >60% increases in Zimbabwe, Jamaica, Paraguay, and Zambia)\(^13\).

The methods used for suicide vary by country. For example the most common methods of suicide are: pesticide poisoning in India\(^12\), hanging in the UK\(^14\), jumping from a height in Hong Kong\(^15\), and firearm suicide deaths in the US\(^16\) - these patterns might reflect the underlying availability of methods.

Most of the world’s suicide deaths (80%) occur in less affluent nations, with India and China alone accounting for 42% of all deaths (Figure 1). On average, suicide rates are higher in LMICs than the rest of the world but current rates are likely to be gross underestimates as many LMICs have poor suicide surveillance data\(^13\). In some countries (45 countries at last count in 2014) suicide is considered a criminal act, which will further impact on the validity of reported rates\(^17\).
Even with these data caveats, the current epidemiological picture of suicide deaths globally tells an important story; suicidal behaviour in LMICs may be different to that in high-income countries (HICs). Furthermore, not all LMICs are the same - there are important differences within this broad grouping. Whilst globally, there are 2-3 male suicide deaths for every female death, in several countries (including India and China) the sex ratio is much narrower or is reversed (Further details are available in Appendix 2). In women in lower-middle income countries suicide rates appear to be highest in younger age groups rather than increasing with age, as is the case in other parts of the world (Figure 2). Panel 1 discusses the issue of suicidal behaviour in LMICs in more detail.

**Self-harm**

The total number of self-harm episodes worldwide is unknown. The Global Burden of Disease (GBD) study has modelled self-harm rates using a variety of data sources and estimates approximately 20 self-harm episodes for each suicide death each year. The age-standardised incidence rate of self-harm is 62.5 per 100,000 (95% CI 53.2-73.9), with higher rates in females (74.0 per 100,000; 95% CI 62.6-87.6) than males (51.0 per 100,000; 95% CI 43.6-60.0). It is worth noting that these estimated rates are much lower than rates reported in studies from some individual countries (e.g. UK).

There are few self-harm surveillance systems worldwide and this is particularly the case in LMICs. Comparing self-harm data across countries is even more problematic than it is with suicide, but understanding international patterns (even with the limitations) is useful. Whilst India accounts for the largest proportion of self-harm (30%), rates appear to be the highest in the northern hemisphere, with lowest rates in Africa, Latin America, and the Caribbean. Only two African and two Latin American/Caribbean countries had available data to include in the models so these estimates may well be unreliable. The highest rates of self-harm are observed in young adults (Appendix 3 gives a detailed breakdown).
The data presented above largely represent self-harm that has presented to health services or was recorded in official statistics. This will not capture all self-harm–community episodes in particular might go undetected or unrecorded. For example, evidence from the UK suggests that nearly 60% of adults and 90% of young people who harmed themselves did not contact medical/psychological services afterwards. In both groups, self-cutting was the most common method of self-harm in community settings. Self-poisoning is the most common method in hospital presentations. Patterns of help seeking vary by setting as well as method. In rural Sri Lanka only 4% of pesticide related self-harm (most common method of self-harm there with a high potential lethality) did not present to hospital.

Risk factors

When someone dies by suicide or harms themselves, the most common question asked is, “Why did this happen?” Families, friends, and sometimes even the person who has harmed themselves may look to clinicians for answers. These answers are typically difficult to give. Suicide and self-harm are complex and never the result of a single cause. Many of the risk factors are non-specific and apply to suicide, self-harm and psychological distress. While it is useful for clinicians to have a broad understanding of risk factors, they have limited utility in prediction (see risk assessment below). From a management and prevention perspective, the risk factors that are most significant are those that are modifiable.

Risk factors are often described as either occurring at some time before an individual’s self-harm (i.e., distal or upstream) or occurring close to the event (i.e., proximal or downstream). But this approach can distort suicide and self-harm prevention by giving undue prominence to recent and individual level risk factors. Instead, a socioecological model of suicide and self-harm which considers the individual in their wider context may be more helpful. It addition, the same risk factor (e.g. job loss, loss of parent) may have a different impact based on when it occurs in
someone’s life so a life course approach is also useful. Appendices 4 and 5 include further reading on risk factors and further details of the socioecological model.

With respect to the risk factors themselves, at an individual level there is some evidence for a potential genetic contribution to suicide and self-harm. Whilst, numerous associations have been reported between individual genes/genetic variants, and suicidal behaviour, the generalisability and clinical significance of these findings remain uncertain. Research has also identified associations between suicidal behaviour and dysregulation of the hypothalamic-pituitary-adrenal axis and serotonergic neural transmission. The mechanisms by which these changes might influence suicidal behaviour remain under investigation. Certain personality traits (e.g., neuroticism) and psychological factors (e.g. impulsivity) are reported to be associated with elevated risk, with some evidence that the implicated traits change across the life course. Having lower levels of educational attainment and being single/divorced/separated are generally associated with higher levels of risk. Individuals in certain occupational groups are also considered to have an elevated risk of suicide, namely those engaged in manual work (RR 1.3 95% CI 1.4-2.2). There is evidence that the risk of suicide is higher in female (but not male) doctors compared to the general population (SMR 1.46 95% CI 1.02-1.91). Harmful substance use and gambling, can be important risk factors as well as physical pain (lifetime suicide attempt OR 2.15 95% CI 1.73-2.68) and there is some evidence that individuals who have repeatedly self-harmed have a higher pain threshold. Suicidal thoughts are important, but not all individuals who express these thoughts will go onto act on them and not all individuals who harm themselves will have expressed suicidal thoughts. However, factors such as plans, harmful substance use, a past history of self-harm or exposure to self-harm in others may be implicated in the transition from ‘ideation to attempt’. At a community and household level, economic resources (e.g. poorer quality housing, unemployment, fewer financial assets) and knowledge resources (i.e. lower levels of parental education), community/domestic violence, childhood adversity (suicide attempt OR 30.15
95% CI 14.73-61.67)\textsuperscript{43}, household alcohol use\textsuperscript{44}, and bereavement\textsuperscript{45,46} (including by suicide) are associated with an elevated risk of self-harm and suicide.

Some global and societal factors linked with increased self-harm and suicide include physical and cognitive access to lethal means (e.g., pesticides, guns)\textsuperscript{47}, gender and cultural norms\textsuperscript{48,49}, economic recessions\textsuperscript{50,51} and stigma/discrimination towards particular groups\textsuperscript{52}. Groups that experience a high degree of discrimination are considered marginalised groups, and our understanding of suicidal behaviour in these groups is hindered by structural barriers (see Panel 2). Another key global risk factor for suicide and self-harm and one that will become increasingly important is climate change\textsuperscript{53} (see Panel 3).

In addition to a life course and contextual perspective, it is worth considering the relative importance of contributing factors at a population level. The population attributable fraction gives an estimate of the proportion of a condition/outcome which might be eliminated if the risk factor was removed. Existing work suggests broadly equivalent prevention potential of strategies targeted at psychiatric illness and socioeconomic disadvantage in HICs but not in LMICs (For detailed discussion see Appendix 5).

An overall understanding of the factors that contribute to suicide and self-harm risk is important and can help to highlight areas where prevention activities could be targeted. The next section focuses on the clinician’s role, first discussing how to assess someone who is suicidal or has self-harmed, and then how to intervene to prevent them harming themselves in the future.
Assessment

Clinical assessment

A sensitively conducted assessment after self-harm, with close attention given to establishing rapport, can be therapeutic in itself as well as lead to better engagement with future treatment. Patients emphasise the importance of feeling listened to. Although much of the evidence on the benefits of assessment is focussed on self-harm, many of the same principles will apply to patients presenting with suicidal thoughts. Of course, confidentiality is an important issue but the potential value of involving family members or trusted others (with the patient’s consent) should be emphasised. There will also be times when the principles of confidentiality need to be overridden in the interest of patient safety, for example in life threatening situations (https://www.zerosuicidealliance.com/open-about-suicide-sharing-information-can-save-lives).

The nature and context of the self-harm should be explored. A mental state examination should be conducted to identify psychiatric disorders which can then be treated. Collateral histories may be useful in gaining a better understanding of suicidal intent. However, it is essential to be aware that intent can fluctuate and is not always a reliable indicator of future behaviour. Patients who are unable or refuse to consent to assessment and treatment may present a specific clinical challenge. Legislative frameworks in many countries make provision for the administration of emergency medical treatment in these situations. Clinicians should be familiar with local policies, current debates regarding the provision of compulsory treatment and relevant mental health legislation. A detailed guide to the general assessment of self-harm is beyond the scope of this seminar but is outlined elsewhere. We would argue that all clinicians regardless of speciality should be able carry out basic assessments. Of course, not all patients and clinical situations are the same. For some there may be acute needs which need addressing urgently.
In-depth assessments of context, mental state and treatment needs, sometimes referred to as psychosocial or biopsychosocial assessments, have been associated with a reduction in repeat self-harm among patients presenting to emergency departments in HICs\textsuperscript{59,60}. These assessments should, therefore, be made available to all patients presenting to clinical services with self-harm once serious physical health issues have been addressed. The evidence-base for the benefits of assessment in LMICs is less developed. The WHO’s Mental Health Gap Action Programme (MHGap) has been recommended for use in non-specialist settings, however its effectiveness in preventing suicide or self-harm has not been evaluated.

\textit{Risk assessment}

Risk assessments are in widespread use in mental health services. Clinicians categorise patients as at high, medium, or low risk of suicide or score them on a scale to predict repeat self-harm and allocate treatment. However, current methods for assessing risk, such as unassisted clinician classification or the use of risk scales\textsuperscript{61,62}, are insufficiently accurate for this purpose.

The comparative rarity (in population terms) of repeat self-harm or suicide, means the positive predictive values (the proportion of patients assessed at high risk who actually go on to have adverse outcomes) will always be low. The majority of patients classified as high-risk will not die by suicide\textsuperscript{62}. Importantly, false negatives result in treatment being withheld from patients classified as low-risk who then end their lives. The absolute number of suicide deaths is greater in the low-risk group because a higher proportion of patients are classified as low-risk (the population paradox\textsuperscript{63}). Nearly 90\% of mental health patients in the UK who died by suicide were rated by their clinical teams as at no or low-risk of suicide when they were last seen\textsuperscript{64}.

Additionally, patients who have experienced risk assessments report fear and anxiety regarding misclassification, the possibility of their freedoms being restricted through the use of unnecessary treatment\textsuperscript{54}, and a lack of involvement in the process\textsuperscript{64}. Risk stratification and the use of risk
assessment tools may be even less useful in LMICs where the incidence of repeat self-harm and suicide after self-harm are much lower\textsuperscript{65}.

Risk scales are popular forms of risk assessment. They may provide a structured, transparent approach and the US National Strategy for Suicide Prevention recommends use of these scales to predict risk, whilst the European Psychiatric Association supports their use in conjunction with psychiatric assessments\textsuperscript{66,67}. Yet, current risk scales do not account for the complex and rapidly fluctuating nature of risk. Their use in clinical settings is highly variable, for example a UK study found 156 different suicide risk tools in use in mental health services\textsuperscript{64}. A tick-box approach can also impede therapeutic engagement\textsuperscript{68}. In light of these factors and their poor predictive value, the UK, Australian and New Zealand Clinical Guidelines advise against their use in risk prediction and treatment allocation\textsuperscript{69,70}.

Several novel methods for risk assessment are currently being developed. The Implicit Association Test predicts suicidal behaviour by measuring mental associations between the concepts “life/death” and “me/other”\textsuperscript{71,72}. Computerised adaptive tests are an individualised multi-dimensional approach in which follow-up questions are determined by previous responses, thereby enabling concise assessment of a wide range of the most relevant risk factors\textsuperscript{73,74}. Machine-learning involves the identification and testing of complex patterns or combinations of risk factors within large datasets. Classification is automated and determined by algorithms, which may be subject to a range of biases\textsuperscript{75,76}. These new approaches may be more accurate than existing approaches, but further quantitative and qualitative work is needed to establish their usefulness in management.

Furthermore, even a hypothetical risk tool which was 100\% accurate in terms of predicting categorical events would not tell us when someone might harm themselves or die by suicide.

If novel methods are to be incorporated into clinical practice, ethical and legal questions, regarding the extent to which algorithmic decisions should be relied upon and who takes responsibility for the
deaths of those misclassified, will need to be considered. For now, clinical assessments should be collaborative, focusing on meaningful engagement, understanding the causes and context of distress, and identifying and addressing the current psychosocial needs of all patients. No patients presenting with self-harm should be denied care based on risk stratification.

**Intervention and prevention**

*Psychological interventions*

Research suggests psychological interventions may be effective in preventing self-harm and suicide, although current evidence has substantial methodological limitations and is limited to HICs. Cognitive behavioural therapy (CBT) and related treatments have the strongest evidence base for reducing suicidal ideation and repeat self-harm compared with treatment as usual. Dialectical behavioural therapy, an intensive psychological intervention that incorporates principles of CBT, mindfulness techniques and a focus on acceptance and emotional regulation, appears to reduce self-harm and crisis service use. It may be particularly helpful for individuals with longstanding emotional and interpersonal difficulties (some of whom may carry a ‘personality disorder’ label).

There is growing interest in brief interventions and digital treatments due to their potential to improve access to care, particularly where resources are limited. Brief interventions, which generally comprise brief contact, care coordination, safety planning, and/or other short-term therapies, have been associated with a reduction in repeat self-harm. Digital treatments for suicide and self-harm have shown promise. In mainly community-based samples, self-guided digital interventions using a range of therapeutic approaches were effective in reducing suicidal ideation when they focussed directly on suicidality rather than depression. It is, however, noteworthy that many seemingly helpful mobile phone applications are not evidence-based, and some include harmful content.

*Pharmacological interventions*
The use of medication to prevent suicide is considered controversial. Concerns have been raised about the potential medicalisation of the human condition, the risk of medications being taken in overdose, and the possibility of exacerbating suicidal thoughts, particularly in young people\textsuperscript{11}. However, treatment of underlying psychiatric conditions through medication can reduce suicidal behaviour. Prescribing decisions should take the risk of harm and potential toxicity in overdose into account\textsuperscript{85,87}. These safer prescribing principles apply to pharmacological treatments for underlying physical as well as mental health disorders. Close monitoring of adherence and side effects in collaboration with the patient is essential\textsuperscript{88}.

Evidence from mostly observational studies suggest antidepressants may reduce the risk of suicide\textsuperscript{89}. However, some research has found an association with increased risk of suicide-related outcomes in young people. The evidence base is far from complete as many randomised trials exclude those at heightened risk of self-harm or suicide\textsuperscript{11,89}. The mood stabiliser lithium has been associated with reduced suicide rates in people with bipolar disorder and depression, and this may be a specific effect not seen with other mood stabilisers\textsuperscript{90-92}. Intriguingly ecological data suggests that levels of naturally occurring lithium in drinking water may be inversely associated with rates of suicide\textsuperscript{93}. Whilst clozapine has been previously associated with a decreased rates of suicide in people with schizophrenia or schizoaffective disorders\textsuperscript{94}, this reduction was not observed in a recent systematic review\textsuperscript{95}. There is preliminary evidence regarding the protective effect of opioid agonist treatment for people with, and without, opioid dependence\textsuperscript{96,97}. Ketamine has shown promise in rapidly reducing suicidal ideation in the short term for people with psychiatric disorders, however its effectiveness in suicide and self-harm prevention is unknown\textsuperscript{98}.

\textit{Social interventions}

Interventions that address social factors seldom investigate self-harm or suicide as an outcome. However, a limited evidence base exists for the impact of social interventions on mental health. For example, a systematic review of interventions to reduce unemployment and financial difficulties
found ‘job-clubs’ to be associated with lower levels of depression. Many intimate partner violence interventions are also associated with improvements in mental health outcomes. Findings with regards to befriending interventions to address loneliness and provide social support are less clear, although the effectiveness is likely to depend on the specific nature of the intervention.

*Community health workers*

Much of the published literature on individual-level interventions is from HICs. In LMICs there is increasing evidence regarding the use of task-sharing by community health workers (CHWs) to deliver mental healthcare. CHWs have been tasked with delivering both standardised psychological and pharmacological treatments as well as novel community-developed interventions, in a range of settings including homes, healthcare facilities, places of worship and community centres.

*Training*

Experiences of clinical care following self-harm can influence a patient’s likelihood of repeating the behaviour. The importance of the skills, knowledge, and attitudes of those conducting assessments should not be underestimated. A randomised controlled trial examining the effect of training staff in the assessment and treatment of suicidal behaviour found that being seen by trained staff reduced suicidal thoughts in patients who were depressed and suicidal.

What content should be included in training packages? In the UK, a series of competency frameworks have been devised which list key knowledge, skills, and attitudes and are intended to inform the development of training curricula and evaluation of training and practice. Local needs assessments of healthcare professionals are useful in identifying gaps in competencies and developing culturally relevant training programmes. The involvement of patients and carers is invaluable.

*Improving health services and systems*
In HICs most individuals who die by suicide have been in touch with health services; data suggests average rates of contact are approximately 80% with primary care, 40% with emergency departments and 30% with specialist mental health services in the year before death\textsuperscript{107-109}. A focus on safety in services can reduce suicide rates – a key principle is system wide change across services rather than focussing on individual level interventions. One study found that improved crisis care, policies for alcohol and drug misuse, and the involvement of families in serious incident reviews was associated with a reduction in suicide across all mental health services in England and Wales\textsuperscript{110}.

Furthermore, the organisational context was important. For example, service changes had more of an impact in organisations with a stable workforce\textsuperscript{111}. Multi-component interventions across health and community settings in HICs also show promise\textsuperscript{112}. There is clearly a role for health services in suicide prevention in LMICs, but the exact role is less certain.

\textit{Public health approaches}

Restricting access to lethal means is a key area of focus\textsuperscript{113} and is effective because many suicide attempts are unplanned and may involve a last-minute decision. People attempting suicide or self-harm may be ambivalent about their intent and so restricting access to means can ‘buy time’ during which suicidal thoughts fade. Pesticides account for approximately a fifth of global suicide deaths\textsuperscript{114} and national bans of the most toxic formulations appear to lead to falls in suicide rates\textsuperscript{47}. For example, in Sri Lanka an estimated 93,000 lives were saved over two decades\textsuperscript{115}. Legislation restricting access to other means such as firearms and frequently used locations\textsuperscript{116} have also been associated with decreased suicide rates\textsuperscript{113}. Further cross-national regulation of access to lethal means has the potential to reduce global suicide rates\textsuperscript{113}.

Traditional and newer media also have a key role in suicide prevention. News reporting of celebrity suicide may be associated with an increase in population suicide rates\textsuperscript{117}. Similarly, suicidal behaviour has been shown to increase in relation to fictional portrayals on streaming services\textsuperscript{118}. Possible mechanisms include identification with the deceased, social learning or increased cognitive
availability. Where methods are reported, a greater increase in use of that reported method has been observed\textsuperscript{117}. Guidelines have been developed to promote responsible reporting in the media, as well as discussions about suicide on social media\textsuperscript{119}. Not glamourising deaths and avoiding detailed reference to means of suicide are two important principles. There is also growing research into how, carefully designed media campaigns might contribute to suicide prevention\textsuperscript{120}. Panel 4 considers the much-discussed role of the internet in relation to suicidal behaviour.

School-based strategies may also be effective. Several randomised controlled trials of interventions focussed on improving mental health awareness, or promotion of good behaviour, have found a reduction in suicidal ideation and attempts\textsuperscript{113,121}. However, when professionals are delivering interventions, they need to be appropriately resourced and properly trained. A large trial from India showed that a multi-component health-promotion intervention in schools improved psychological and behavioural outcomes when delivered by lay counsellors but not when delivered by teachers\textsuperscript{122}. In fact there was some evidence that teacher-led delivery was associated with increased risk of self-harm.

Substance misuse policies are frequently lacking from local and national suicide prevention strategies, despite restrictive alcohol policies and engagement in substance misuse treatment both being associated with decreased suicide risk\textsuperscript{123}.

Community interventions to shift social norms, and thereby address risk factors for suicide, are likely to be useful in suicide prevention, although their impact on suicidal behaviour specifically is rarely measured. For example, at least 85 programmes have targeted gender inequality and restrictive gender norms to reduce risk behaviours such as interpersonal violence and, consequently, improve health outcomes\textsuperscript{124,125}. Successful interventions have involved a multi-level, multisectoral approach, empowering members of the community to take action through a diverse programme of innovative and culturally-sensitive activities.
The effects of social and economic policy on suicide rates have been discussed extensively in the literature. Economic recessions and high unemployment rates are associated with higher rates of suicide\textsuperscript{50,51,126}. Increased welfare spending may mitigate these effects leading some researchers to suggest “recessions hurt but austerity kills”\textsuperscript{127}. Many of these factors have been brought into sharper focus with the COVID 19 pandemic but its influence on suicidal behaviour is much wider than its economic impacts (see Panel 5 for a summary).

\textit{Postvention}

Providing timely care to those bereaved after a suicide death occurs is important because of the potential to prevent further deaths. Over 130 people are thought to be affected by each person who dies by suicide, and for many their grief will be prolonged. Those affected are at increased risk of suicidal behaviour and adverse physical health outcomes\textsuperscript{128,129}. This is an area of increasing academic and policy activity but research demonstrating the effectiveness of interventions in supporting those bereaved is currently limited\textsuperscript{130,131}. Nonetheless, preliminary evidence indicates that interventions involving a series of facilitated educational, supportive and/or therapeutic sessions may be helpful\textsuperscript{130}. Individuals who have been bereaved through suicide can experience stigma and isolation, therefore acknowledgement and proactive offers of support from healthcare professionals are also highly valued\textsuperscript{132,133}. A number of practical resources are available for those who are bereaved by suicide\textsuperscript{134}.

The suicide of a patient can be profoundly emotionally, professionally, and practically challenging for healthcare professionals, yet until recently little attention has been given to providing support and encouraging self-care following such an experience\textsuperscript{135,136}. There is increasing recognition that improvements in this area will ultimately lead to better patient care, and resources are now being developed for clinicians affected by a patient suicide and/or in contact with those who have been bereaved\textsuperscript{137,138}.
National strategies

National strategies for suicide prevention draw together initiatives focussed on individuals and societies but a long-term approach to suicide prevention is also essential. The Sustainable Development Goals for 2030, agreed by the United Nations General Assembly in 2015, include suicide mortality as an indicator. National suicide prevention strategies are considered vital in attracting political attention, identifying local challenges, galvanising effort, and promoting accountability. In less than a decade, at least 38 countries have developed suicide prevention strategies. The WHO provides examples of strategies from every world region to demonstrate the diversity of approaches and inspire further development.

Conclusion

Suicide is an individual tragedy as well as a global concern. Its prevention must involve both a clinical and societal focus. Every health professional has a crucial role to play, whether by sensitively assessing or treating self-harm or advocating for the implementation of suicide prevention measures. Current and emerging threats, such as the COVID 19 pandemic, migration and climate change, will have an impact on suicide and self-harm. Ageing populations, the use of data and new technologies, and suicide prevention in LMICs are additional challenges. Future research might best focus on intervention, although in settings where our understanding is limited, further aetiological research may be helpful. In health services we should aim to implement what we know and provide high quality care for every patient who presents with suicidal behaviour.
**Author contributions**

All authors contributed to conceptualisation and content. DK led the drafting and coordinated the revision process supported by NK and PP. PP drafted the Fast Facts document.

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GNH sits on the Pharmacology and Therapeutics Advisory Committee (PTAC) of Pharmac, New Zealand’s drug buying agency. GNH undertakes some private work for the Accident Compensation Corporation (ACC), New Zealand’s national insurance agency and complete reports for registering health bodies.

NK chaired the committees developing the NICE Guidelines for Self-Harm (Longer Term Management) 2012 and the NICE Quality Standards on Self-Harm 2013; NK is currently topic advisor for the new NICE guidelines on self-harm and Chair of the Guideline Committee for the NICE Depression Guidelines. NK works with NHS England on national quality improvement initiatives for suicide and self-harm and sits on the Department of Health and Social Care's National Suicide Prevention Strategy Advisory Group for England. The views expressed in this article are the authors' own and not those of the Department of Health and Social Care, NHS England or NICE.

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Search strategy and selection criteria

We searched Medline and Embase from Jun 2015 to Jan 2021 using the indexed terms suicide and self-harm in combination with section specific terms which included epidemiology, risk factors, prevention, and intervention. We gave precedence to publications within the last 5 years and systematic reviews identified through these searches. We do, however, also reference highly cited older publications. Relevant contemporary review articles and book chapters are also included for further reading.
Figure 1 – Global distribution of suicide by (A) rates, (B) proportion of total suicide deaths, and (C) age and sex distribution of suicide by World Bank Income groups

Data based on the 2019 release of the Global Burden of Disease Study²

HI – High Income; UMI – Upper-middle income; LMI – Lower-middle income; LI – Lower-income


Fast facts for suicide and self-harm

Definition
- The World Health Organisation (WHO) defines suicide as ‘an act of deliberately killing oneself’.
- In practice, there is considerable variation in the definitions and thresholds used to classify deaths as suicides.
- We refer to self-harm as ‘non-fatal self-poisoning or self-injury irrespective of the apparent purpose of the act’.
- There is, however, extensive debate about whether intentional non-fatal self-injury should be dichotimised based on suicidal intent.

Epidemiology
- The estimated global rate of suicide is 9.4 per 100,000.
- Approximately 80% of suicides occur in low- and middle-income countries, where the epidemiology differs to high income countries.
- Annually, there are believed to be roughly 20 self-harm attempts for every suicide death.
- The rate of suicide is higher in males compared to females, whilst the rate of self-harm is higher in females compared with males.
- To date, the Covid-19 pandemic has not been associated with a rise in suicide or self-harm rates, but this may mask rises in subgroups such as ethnic minority groups, and the longer-term impacts of the pandemic remain unknown.

Risk factors
- Suicide and self-harm are complex; no single factor will result in someone dying by suicide or harming themselves.
- A socioecological model of suicide and self-harm captures the wide range of risk factors relating to both an individual and the wider context.

Assessment
- A sensitively conducted assessment after self-harm be therapeutic in itself, and can lead to better engagement with future treatment.
- Existing risk assessment methods are not sufficiently accurate to predict repeat self-harm or suicide, and should not be used to inform treatment allocation.
- Assessments should be collaborative, focussing on meaningful engagement, understanding the causes and context of distress, and identifying and addressing the current psychosocial needs of all patients.
- In high-income countries, there is sufficient evidence of a benefit to recommend that all patients presenting to emergency departments with self-harm should receive an in-depth psychosocial assessment.

Intervention
- Of psychological therapies, cognitive behavioural therapy has the strongest evidence base for reducing suicidal ideation and repeat self-harm.
- The use of medication to prevent suicide is controversial, and requires careful consideration of both risks and benefits.
• Pharmacological treatment of underlying psychiatric conditions can reduce suicidal behaviour.
• Social interventions seldom investigate self-harm or suicide as an outcome, but have an important role in addressing modifiable social risk factors.
• There is a dearth of evidence on interventions in low- and middle-income countries.

Prevention
• Restricting access to lethal means, such as pesticides or firearms, is one of the most effective suicide prevention strategies at a population-level.
• Media reporting and portrayals of suicides may be associated with increased suicide rates. It is, therefore, important that the media follow guidelines that promote responsible reporting.
• Economic recessions and high unemployment rates are associated with higher rates of suicide, and increased welfare spending may mitigate these effects.
• Community interventions to shift social norms, and thereby address risk factors for suicide, are likely to be useful in suicide prevention, although their impact on suicidal behaviour specifically is rarely measured.
• Those affected by a suicide, including healthcare professionals experiencing the suicide of a patient, require timely support. Practical resources are now being developed to facilitate this.
<table>
<thead>
<tr>
<th>Panel 1</th>
<th>Low- and Middle-Income Countries (LMICs)</th>
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<tr>
<td>Overall, 80% of global suicide deaths occur in LMICs but less than 15% of research originates from these settings (^{A1}). Our understanding and the specific evidence-base for preventing and treating suicide and self-harm in LMICs is inadequate. Given the different epidemiological profile of individuals who self-harm and die by suicide (^{A2}), the effectiveness and applicability of HIC research evidence is limited. Whilst evidence from HICs points to the treatment of psychiatric disorders as a central focus for suicide and self-harm prevention, evidence from LMICs suggest that the prevalence of psychiatric disorders in individuals who die by suicide and self-harm is much lower (^{A2}). Indeed, research from Brazil suggests that increased coverage of community mental health care facilities had limited impact on suicide mortality, whilst the provision of cash transfers to meet basic needs (i.e. food) was associated with a 61% lower rate of suicide (^{A3}).</td>
<td></td>
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<tr>
<td>The structure and size of families suggests that the impact of a suicide death may affect a larger number of people than those estimated from HICs (^{A4}). The formal support systems for individuals bereaved are less well established. HIC evidence suggests that individuals who are bereaved are less likely to receive informal support following a suicide death than those bereaved from other causes of death (^{A5}). This may not, however, be the case in LMICs where community-led responses may be stronger. This community support may also partly explain the lower rate of repeat self-harm (and subsequent death by suicide) that is observed in some LMICs (^{A6}). However, there has been little actual research investigating this hypothesis and it should not be assumed that this is the case, especially as interpersonal conflicts/poor family relationships are common reported antecedents (^{A7-9}), and domestic violence is strongly associated with increased risk of self-harm (^{A10}). Furthermore, compared to HICs the risk of suicide is heightened in individuals who are married (especially women) and those with young children (^{A11}).</td>
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</tr>
<tr>
<td>Another key challenge to our understanding of suicide and self-harm in LMICs, is that the behaviour in these contexts is seen through the lens of research methods and insights developed in HICs. This misses important differences. For example, conceptualisations developed in HICs systematically disregard certain forms of non-suicidal self-harm in LMICs. The DSM-5 diagnostic categorisation of non-suicidal self-injury excludes those who have self-harmed by self-poisoning, yet evidence from LMICs suggests that over half of individuals who self-poison have no suicidal intent (^{A12}). In addition, the importance of ritualised self-harm (which generally occurs without suicidal intent) is largely ignored. These acts are coping mechanisms for individuals in distress and are reported to be a means of dealing with pain (^{A13}).</td>
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</tbody>
</table>
Panel 2

Marginalised groups

Individuals from minority groups, whether it be ethnic or sexual, are more likely to be socially disadvantaged and to experience minority stress/distress. The associated disadvantage and stress are related to poorer health and could reasonably equate to increased risk of suicide and self-harm, which appears to be the case for sexual minorities.

The most well researched marginalised group are individuals from ethnic minority backgrounds, which includes indigenous groups. Whilst there are differences between indigenous and other ethnic minority groups, both share similar risk factors for suicide and self-harm. Both groups are subject to discrimination, and tend to have different cultures, language, political rights, and wealth from their majority ethnic counterparts. Importantly, both populations have a past of colonisation. The history and effects of slavery and indigenous genocide have transcended generations of ethnic minority and indigenous people.

The majority of the research evidence suggests that the risk of suicide or self-harm (including repeat self-harm) is lower in ethnic minority groups compared to their ethnic majority counterparts. The exception is with indigenous populations, where the rate of suicide and self-harm has been reported to be higher. The lower risk of suicide and self-harm in other ethnic minority groups may be a true effect or could be an artifact of the study design. Most research on suicide and self-harm risk in individuals from ethnic minority backgrounds are either based on individuals presenting to services (e.g., hospital) or death certification. Service based research is adequate if there are no systematic differences in service use and access by marginalised groups, however this is not the case. Suicide death registration studies have also been shown to suffer from misclassification bias, whereby individuals from ethnic minority backgrounds are less likely to have their death recorded as a suicide. In addition, where ethnicity is not recorded prior to death, ethnicity misclassification can also occur. This extends to studies which use observer categorised ethnicity in healthcare settings which tend to rely on skin colour- this method misclassifies individuals from ethnic minority backgrounds (especially those from Black or Mixed groups). These systemic barriers may be masking important health inequalities. Research evidence from Indigenous populations, which are often based on specific registers designed to track the health of indigenous people, point to the possibility that apparent lower risk may not be real.

We need better systems in place to understand suicide and self-harm in marginalised groups (e.g. ethnic and sexual minorities, indigenous people), as these groups may benefit from tailored interventions. It has been suggested that the development of such interventions need to be trauma-informed and strengths-based and, most important of all, meaningfully involve the marginalised communities themselves.

References are found in appendix
Panel 3

Climate change, conflicts and forced migration.

Climate change and its influence on health is of great concern. The impact is unequal and is disproportionately affecting populations in LMICs, where most suicide deaths occur. As the impact of climate change worsen, and extreme climatic events such as droughts, heat waves, and floods become more common place, the resulting loss of life (i.e., increased bereavement), livelihoods, and property are likely to increase suicide and self-harm risk. Conflicts arising from scarce resources linked to climate change are also likely to increase.

It is estimated that by 2050 there will be 25 million to 1 billion climate migrants, many of them affected by rising sea levels. The uncertainties and feelings of powerlessness over rising sea-levels can increase poor mental health and thus suicide and self-harm. There are methodological difficulties in linking climate change to mental health, but links have been made between increased risk of suicide and self-harm with rising temperatures. Evidence has also shown that individuals who have been displaced are more likely to self-harm than host populations, but not to die by suicide. A less direct impact of climate change can be seen in crop failure increases, and yield decreases. An ecological analysis based on Indian data suggests that climate change induced economic hardships may be associated with increased suicide.

Whilst the field of suicide and self-harm research has not historically focussed on the importance of climate change and migration, this is an area of burgeoning interest. The needs of this growing population of climate migrants and refugees (and asylum seekers) from conflict zones will need to be addressed both at a policy and clinical level.

References are found in appendix
Investigation into the association between Internet use and suicidal behaviour is a rapidly expanding area of research. Most studies to date have been descriptive or cross-sectional, and focused on children and young people. Whilst evidence suggests that high levels of general Internet use, Internet addiction and cyber-bullying may be associated with increased suicidal behaviour, studies which have considered other types of use and differentiated between groups of users demonstrate the potential for both harmful and beneficial effects.

Exposure to online self-harm related content can increase risk of self-harm by triggering urges, creating a sense of competition, normalising self-harm, and encouraging imitation. The Internet increases the accessibility of suicide via exposure to information about methods and pro-suicide discussions. Whether this information is actively sought out or stumbled upon appears to be influenced by the severity of an individual’s suicidal feelings.

Conversely, the creation and sharing of self-harm related online content can reduce self-harm urges by providing an alternative outlet for difficult emotions. The Internet also offers isolated individuals, who may not present to services, a sense of solidarity and community as well as support.

Within clinical assessments, an exploration of self-harm related Internet use can enhance understanding of a patient’s suicidal thinking and facilitate discussion about their recovery. From a public health perspective, clinical professional bodies have a role in informing policy regarding the regulation of self-harm related online content to ensure a considered approach, which maintains focus on suicide prevention and minimises unintended consequences.

References are found in appendix
Panel 5

COVID-19

There is great concern over the impact of the COVID-19 pandemic and associated public health measures on mental health, particularly in relation to suicide and self-harm. Balancing limiting the spread of the virus and deaths arising with the indirect impacts of lockdown measures on suicide and self-harm is challenging. Evidence from 21 high- and upper-middle income countries indicate that in the early months of the pandemic suicide rates declined or remained relatively unchanged \(^{448}\), with the exception of Japan, where suicide rates appear to be increasing after an initial decline \(^{449}\). Surveillance systems for suicide are limited in LMICs, but emerging evidence from India shows a decrease in suicide during lockdown \(^{550}\). This decline in suicide may be a consequence of increased social cohesion and contact, reduced social isolation and in some countries may be attributed to policies which have mitigated possible negative impacts (e.g., increased economic support).

Similar reductions in self-harm representations to health services have been recorded in several countries \(^{51,52}\), though not all \(^{53}\). This needs to be interpreted with caution as a reduction in self-harm presentations to health services may reflect concerns over contracting the virus and not reflect a reduction in self-harm rates. There are limited community based surveillance systems worldwide, but evidence from the UK suggests that self-reported self-harm rates have remained the same \(^{447}\), whilst calls to crisis hotlines have increased \(^{54,55}\).

Whilst population level rates of self-harm and suicide during the early months of the pandemic appear to have declined, this overall picture masks important differences in experiences for sub-groups. For example evidence suggests that individuals from ethnic minority groups have experienced an increased risk of suicide post pandemic, whilst their ethnic majority counterparts have experienced a decline \(^{556}\). Similarly rates of self-harm presenting to hospital during the pandemic may have increased in more deprived areas compared to affluent areas in Australia \(^{447}\).

The research evidence to date has indicated no rise in terms of suicide and self-harm at least in the short-term. The longer-term impacts of the pandemic and associated public health measures are still unknown. There is emerging work suggesting that survivors of COVID-19 infection had increased psychiatric morbidity. Follow-up of these patients need to be carefully managed to ensure no subsequent risk of suicide or self-harm \(^{557}\).

Previous research has suggested that economic recessions are linked with increased suicide \(^{558,59}\). Mitigating the impact of the economic fall-out of the pandemic on the well-being of populations should be a priority. However, even in the novel context of the pandemic and its aftermath, the wider suicide prevention evidence base remains relevant. The principles of safe, high quality care within clinical services remain unchanged.

References are found in appendix
Appendix 1 – Terminology and Language

The World Health Organisation (WHO) defines suicide as an act of deliberately killing oneself[^1] but the way that it is defined in practice varies widely. In some countries the police make the determination, while in others medical examiners or coroners investigate sudden deaths[^2]. Thresholds also vary with a ‘beyond reasonable doubt’ criteria applied in some jurisdictions and a ‘balance of probabilities’ criteria in others. Even within countries, thresholds can vary over time. For example, in England and Wales there was a recent move to a less stringent ‘balance of probabilities’ threshold, which may have implications for the interpretation of longitudinal trends. The language used to talk about suicide is also relevant – in our view the use of the phrase ‘commit suicide’ should be avoided by clinicians. It is a linguistic legacy of previous eras in which suicide was considered sinful or an illegal act, and even today has criminal connotations. Phrases such as "died by suicide", "ended their life" and "took their own life" are preferable[^3]. However, clinicians should be aware that some work suggests views regarding the phrase "commit suicide" amongst those bereaved by suicide are varied[^4].

Self-harm can be defined as ‘self-poisoning or self-injury irrespective of the apparent purpose of the act’. There is extensive debate about how non-fatal intentional injury should be conceptualised with some arguing that we should dichotomise individuals into those who have harmed themselves with an intent to die (i.e. made suicide attempts), and those who have self-harmed with no suicidal intent (i.e. engaged in non-suicidal self-harm). This distinction may have limited clinical utility (see[^5] for detailed discussion) given that motivations and intent are fluid, the behaviours often overlap[^6], and even so called non-suicidal behaviours are associated with future suicide[^7]. Self-harm might be best seen as part of a continuum. An additional problem is that the DSM-5 diagnosis of non-suicidal self-injury[^8] excludes self-poisoning, even episodes without suicidal intent. Self-harm and suicide are

[^1]: Non-suicidal self-injury is the intentional destruction of one’s body tissue without suicidal intent and are for purposes which are not socially sanctioned.
complex behaviours with a variety of underlying causes. They are not diagnoses and we are certainly not advocating a one size fits all approach to treatment and prevention. Strategies must be tailored to the individual, taking into account the context within which they live.
Appendix 2 - Global distribution of suicide by M:F age-standardised rate ratio
Appendix 3 – Age and sex distribution of non-fatal self-harm by World Bank Income group

Data based on the 2019 release of the Global Burden of Disease Study.

HI – High Income; UMI – Upper-middle income; LMI – Lower-middle income; LI – Lower-income

Appendix 4 – Previous reviews and seminars

There are a number of previous seminars and reviews which provide excellent additional reading.
## Appendix 5 – Socioecological model of suicide and self-harm

<table>
<thead>
<tr>
<th>Community/society</th>
<th>Access to means: Physical and cognitive access to lethal means</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Societal norms: gender norms, stigma around mental ill health, cultural meaning of suicide/self-harm</td>
</tr>
<tr>
<td></td>
<td>Inequality and discrimination of minoritized groups (e.g. by ethnicity, sexual orientation, migratory status)</td>
</tr>
<tr>
<td></td>
<td>Environment: War, <strong>natural disaster</strong>, climate change, community violence/social cohesion</td>
</tr>
<tr>
<td></td>
<td>Resource availability: access to healthcare/support, education, welfare support, economic recessions</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Resource availability (financial/knowledge)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environment: Family/household substance misuse, Domestic violence, social support</td>
</tr>
<tr>
<td>Household crisis: Illness, bereavement</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Household</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caregiver health: Maternal mental health</td>
</tr>
<tr>
<td>Early life adversity: Abuse, neglect, bullying, insecurity (food/housing), household disruption and suicide</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Individual</th>
</tr>
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<tbody>
<tr>
<td>Genetic factors</td>
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<td></td>
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<tr>
<td></td>
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<td></td>
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<tr>
<td>Marital status: Divorced/separated men, married women</td>
</tr>
</tbody>
</table>

| In-utero | Childhood | Adolescence | Adult | Older adult |
Appendix 6 - Population Attributable Fraction (PAF) example

Causality is not well established in suicide or self-harm research, but the PAF statistic allows each factor to be put in perspective considering both the strength of the association with suicide and how common that factor is in the population. A well-known risk factor for suicide and self-harm is a psychiatric disorder; reported in 80-90% of individuals who have self-harmed or died by suicide in HIC. It is a strong risk factor for suicide (pooled RR: 7.5 (95% CI 6.6, 8.6)), with a PAF for any psychiatric disorder of 9% (range 4%-21%), suggesting that the incidence of suicide might be reduced by nearly one tenth if psychiatric disorder could be eliminated at a population level. Similar PAFs have been generated for socioeconomic disadvantage suggesting strategies which target deprivation might have an equivalent suicide prevention effect to those targeted at clinical populations.

PAF statistics are, however, only valid for the population from which they are derived. This has significant implications, as the current evidence base largely originates from HIC. Considering again the role of mental illness, evidence from LMICs suggest that the prevalence of psychiatric disorders in individuals who have harmed themselves or died by suicide is much lower than in HIC (45%-58%), and that the strength of the association with this risk factor is weaker. In one of the few prospective cohort studies of suicide from a LMICs (China, which accounts for 16% of global suicide deaths) the PAF for psychiatric disorder (lifetime) was 3% (95% CI 2%, 6%). In comparison, the PAF for fewer years of formal education (<6 years) was 23% (95% CI 13%, 33%). This suggests that in this setting, strategies focused on socioeconomic disadvantage (as indicated by lower levels of education) may be more effective at a population level in preventing suicide than those focused on treating psychiatric disorders.
Appendix 7 – References

21. Dickson JM, Cruise K, McCall CA, Taylor PJ. A Systematic Review of the Antecedents and Prevalence of Suicide, Self-Harm and Suicide Ideation in Australian Aboriginal and Torres Strait


43. Twenge JM, Joiner TE, Rogers ML, Martin GN. Increases in Depressive Symptoms, Suicide-Related Outcomes, and Suicide Rates Among U.S. Adolescents After 2010 and Links to Increased New Media Screen Time. *Clinical Psychological Science* 2017; 6(1): 3-17.


