

Suicide and self-harm

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Suicide and self-harm are major health and societal issues worldwide, but the greatest burden of both behaviours occurs in low-income and middle-income countries. Although rates of suicide are higher in male than in female individuals, self-harm is more common in female individuals. Rather than having a single cause, suicide and self-harm are the result of a complex interplay of several factors that occur throughout the life course, and vary by gender, age, ethnicity, and geography. Several clinical and public health interventions show promise, although our understanding of their effectiveness has largely originated from high-income countries. Attempting 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 part to play.

Introduction

Data from WHO suggest that, globally, suicide accounts for at least 700 000 deaths per year. 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.¹ 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.² Suicide has received a great deal of attention during the COVID-19 public health emergency,³ and its prevention will continue to be a priority as we move into subsequent phases and eventual recovery from the pandemic.

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.⁴ Despite suicide and self-harm sometimes being seen as distinct concepts, here we 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 that are often markers of unbearable psychological pain; however, suicide and self-harm are also affected by societal factors. It has been known for at least a century that economic adversity is associated with higher suicide rates. Clinicians need to be at the forefront of suicide prevention efforts, because policy makers and the public will look towards clinicians for leadership, particularly in low-income and middle-income countries (LMICs). Public health factors need to be recognised, and the role of mental and physical health must also be acknowledged—a proportion of people who die by suicide have a psychiatric disorder at the time of death, and many, particularly in older age groups (eg, those older than 65 years), have a physical illness.^{5,6} Most of these individuals, at least in high-income settings, will have consulted health services in the year before they die,⁷ some having harmed themselves. Each clinical encounter should be seen as an opportunity to intervene.

Stigma remains a serious issue in clinical and non-clinical settings, and the language we use is important. Suicide might not be openly discussed, or might 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.”⁸

Patients report that clinicians might blame them or deny them access to high quality care because of the erroneous belief that providing good care will encourage future episodes. Such attitudes might 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 also discuss current and emerging issues. Further discussion of the terminology used throughout the Seminar and the importance of language are included in the appendix (pp 2–3).

Epidemiology

Suicide

One person dies by suicide every 40 seconds,⁹ and for every person who dies, 60–135 people are affected by the death.¹⁰ The global rate of suicide is estimated to

Search strategy and selection criteria

We searched MEDLINE and Embase for articles published between June 1, 2015, and Jan 31, 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 past 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.

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See Online for appendix

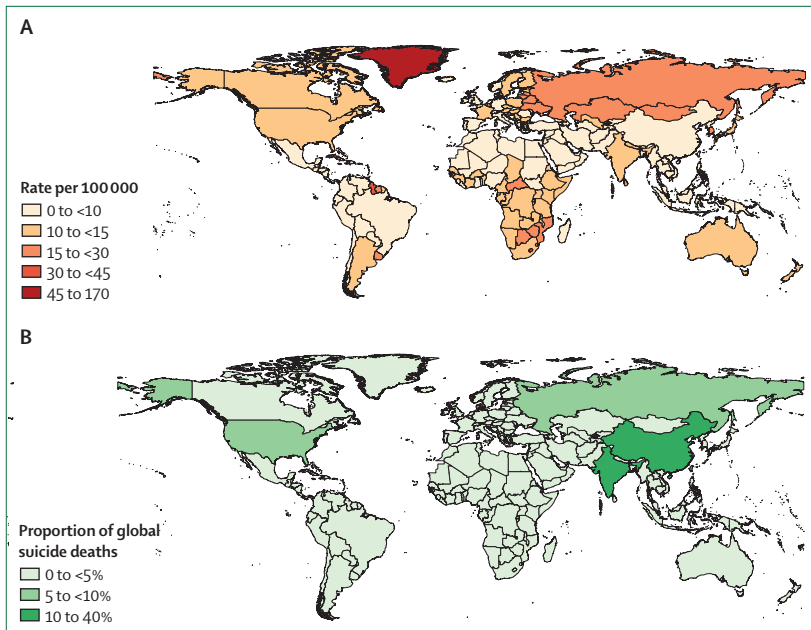


Figure 1: Global distribution of suicide
(A) Number of people who die by suicide per 100 000 population. (B) Proportion of total suicide deaths. Data are based on the 2019 release of the Global Burden of Disease Study.²

be 9·4 per 100 000 people (95% CI 8·5–10·3), with higher rates in male individuals (13·3 per 100 000 [11·3–14·7]) than female individuals (5·7 per 100 000 [5·1–6·4]).² Possible explanations for higher rates in male individuals include methods of suicide (they might choose more dangerous methods with a higher case fatality than female individuals), help-seeking (male individuals are less likely to seek help), and clustering of risk factors (eg, alcohol misuse).¹¹ Suicide is the leading cause of death in people aged 15–34 years, and rates generally increase with age. However, there are some country-specific exceptions (eg, higher rates in people aged 45–49 years in the UK¹² and women and girls aged 15–29 years in India¹³).

The age-standardised suicide rate fell between 1990 and 2016, with some countries reporting substantial reductions (eg, a 64% decrease in China). However, other countries have observed substantial increases (eg, Zimbabwe, Jamaica, Paraguay, and Zambia have seen rises of more than 60%).¹⁴

The methods used for suicide vary by country and region. For example, the most common methods of suicide are pesticide poisoning in India,¹³ hanging in the UK,¹⁵ jumping from a height in Hong Kong,¹⁶ and firearms in the USA.¹⁷ These patterns might reflect the underlying availability of different lethal methods.

Most of the world's suicide deaths (80%) occur in less affluent nations, with India and China alone accounting for 42% of all suicide 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 because many LMICs have

poor suicide surveillance data.¹⁴ In some countries (45 countries at last count in 2014), suicide is considered a criminal act, which will further affect the validity of reported rates.¹⁸

Even with these data caveats, the current epidemiological picture of suicide deaths globally tells an important story: suicidal behaviour in LMICs might be different from that in high-income countries (HICs). Furthermore, not all LMICs are the same—there are important differences within this broad grouping. Although there are two to three male suicide deaths for every female suicide death globally, in several countries (including India and China) the sex ratio is much narrower or is reversed (appendix p 4). Suicide rates for female individuals in LMICs 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 expands on the issue of suicidal behaviour in LMICs.

Self-harm

The total number of self-harm episodes worldwide is unknown. The Global Burden of Disease Study has modelled self-harm rates using various data sources,¹⁹ 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 women (74·0 per 100 000; 62·6–87·6) than men (51·0 per 100 000; 43·6–60·0). It is worth noting that these estimated rates are much lower than rates reported in studies from some individual countries (eg, the UK²⁰).

There are few self-harm surveillance systems worldwide, particularly in LMICs. Comparing self-harm data across countries is even more complex than comparing suicide data, but understanding international patterns (even with the limitations) is useful. Although India accounts for the largest proportion of global self-harm episodes (30%), rates appear to be the highest in the northern hemisphere, with lowest rates in Africa, Latin America, and the Caribbean.² Only two African countries and two Latin American and Caribbean countries had available data to include in the models, so these estimates might be unreliable. The highest rates of self-harm globally are observed in young adults aged 20–24 years (appendix p 5).

The data presented previously largely represent self-harm in individuals who presented to health services or episodes that were recorded in official statistics. These data will not capture all self-harm—community episodes in particular might go undetected or unrecorded. For example, evidence from the UK suggests that as many as 60% of adults and 90% of young people aged 12–17 years who harmed themselves did not contact medical or psychological services afterwards.^{21,22} In both these age groups, self-cutting is the most common method of self-harm in community settings. Self-poisoning is the most common method in hospital presentations. Patterns of help-seeking

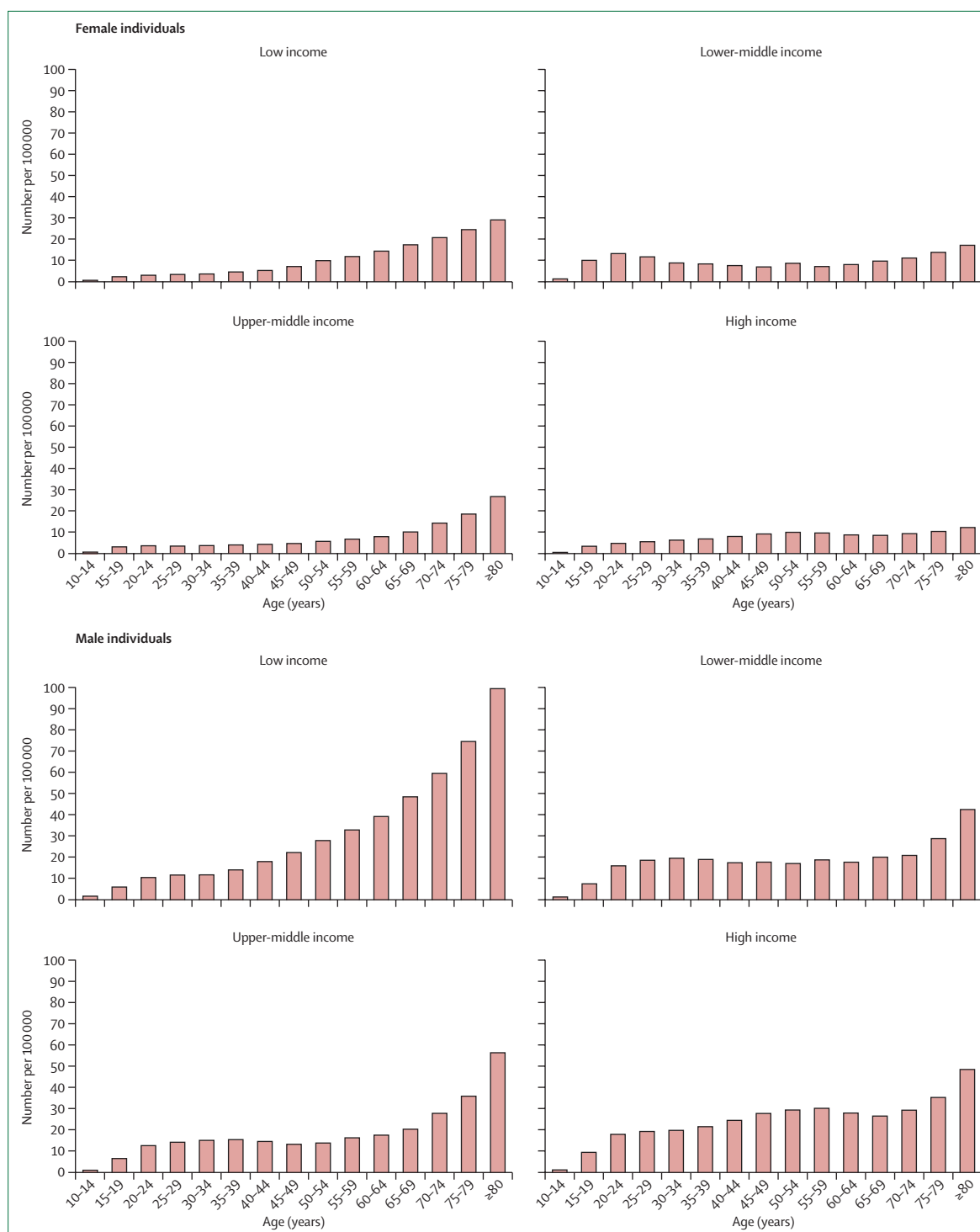


Figure 2: Age and sex distribution of suicide (per 100 000 population) by World Bank income groups
Data are based on the 2019 release of the Global Burden of Disease Study.²

vary by setting and method. In rural Sri Lanka, only 4% of pesticide-related self-harm episodes (the most common method of self-harm in Sri Lanka, which also has a high potential lethality) did not present to a hospital.²³

Risk factors

When someone dies by suicide or harms themselves, the most common question asked is why did it happen? Families, friends, and sometimes even the person who has

Panel 1: Low-income and middle-income countries*

Worldwide, 80% of suicide deaths occur in low-income and middle-income countries (LMICs), but less than 15% of research originates from these settings. 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, the effectiveness and applicability of high-income country (HIC) research evidence is poor. Although evidence from HICs points to the treatment of psychiatric disorders as a central focus for suicide and self-harm prevention, evidence from LMICs suggests that the prevalence of psychiatric disorders in individuals who self-harm and die by suicide is lower than in HICs. Indeed, research from Brazil suggests that increased coverage of community mental health care facilities had little effect on suicide mortality, whereas the provision of cash transfers to meet basic needs (ie, food) was associated with a 61% lower rate of suicide.

The structure and size of families in LMICs suggests that the effect of a suicide death might affect a larger number of people than estimates from HICs. The formal support systems for bereaved individuals are less well established than in HICs. Evidence from HICs 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. However, this reduced support might not be seen in LMICs, where community-led responses might be stronger than in

HICs. This community support might also partly explain the reduced rate of repeat self-harm (and subsequent death by suicide) that is seen in some LMICs. However, there has been little actual research investigating this hypothesis and it should not be assumed to be the case, especially since interpersonal conflicts and poor family relationships are common reported antecedents, and domestic violence is strongly associated with increased risk of self-harm. Furthermore, compared with HICs, the risk of suicide in LMICs is heightened in individuals who are married (especially women), and those with young children.

Another key challenge to our understanding of suicide and self-harm in LMICs is that the behaviours are seen through the lens of research methods and insights developed in HICs, which misses important differences. For example, conceptualisations developed in HICs systematically disregard some forms of non-suicidal self-harm in LMICs. The diagnostic categorisation of non-suicidal self-injury in the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders* excludes individuals who have self-harmed by self-poisoning, yet evidence from LMICs suggests that more than half of individuals who self-poison have no suicidal intent. 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.

*A fully referenced version of this panel is available in the appendix (p 8).

harmed themselves might 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. Although it is useful for clinicians to have a broad understanding of risk factors, these factors have little value in prediction, as we discuss later in the risk assessment section. From a management and prevention perspective, the risk factors that are most important are those that are modifiable.

Risk factors are often described as either occurring at some time before an individual's self-harm (ie, distal or upstream) or occurring close to the event (ie, proximal or downstream). However, 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 that considers the individual in their wider context might be more helpful.²⁴ In addition, the same risk factor (eg, job loss or loss of a parent) might have a different effect according to when it occurs in someone's life, so a life course approach is also useful. The appendix (p 6) provides further reading on risk factors and 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.²⁵ Although

numerous associations have been reported between suicidal behaviour and individual genes or genetic variants, 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.^{26,27} The mechanisms by which these changes might determine suicidal behaviour remain under investigation. Some personality traits (eg, neuroticism) and psychological factors (eg, impulsivity) are reported to be associated with raised risk, with some evidence that the implicated traits change throughout the life course.^{28,29} Having lower levels of educational attainment³⁰ and being single, divorced, or separated³¹ are generally associated with higher levels of risk. Individuals in particular occupational groups are also considered to have an increased risk of suicide—for example, labourers and cleaners (rate ratio 1.3, 95% CI 1.4–2.2) when compared with the working age population as a whole.³² There is some evidence that the risk of suicide is higher in female (but not male) doctors than in the general population (standardised mortality ratio 1.46, 95% CI 1.02–1.91).³³ Harmful substance use^{30,34} and gambling³⁵ can be important risk factors, as well as physical pain (lifetime suicide attempt odds ratio [OR] 2.15, 95% CI 1.73–2.68 when compared with no

Panel 2: Marginalised groups*

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

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

The research evidence is scarce, but mostly suggests that the risk of suicide or self-harm (including repeat self-harm) is lower in minority ethnic groups than in their majority ethnic 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 minority ethnic groups might be a true effect or could be an artifact of the study design. Most research on suicide and self-harm risk in individuals from minority ethnic backgrounds is either based on individuals presenting to services (eg, hospital) or death

certifications. Service-based research is adequate if there are no systematic differences in service use and access by marginalised groups; however, such differences do exist. Suicide death registration studies have also been limited by misclassification bias, whereby individuals from minority ethnic backgrounds are less likely to have their death recorded as a suicide than those from majority ethnic backgrounds. When ethnicity is not recorded before death, ethnicity misclassification can also occur. This misclassification extends to studies that use observer categorised ethnicity in health-care settings, which tend to rely on skin colour. This method misclassifies individuals from minority ethnic backgrounds (especially those from Black or mixed ethnic groups). These systemic barriers might be masking important health inequalities. Research evidence from Indigenous populations, which is often based on specific registers designed to track the health of Indigenous people, points to the possibility that the apparent lower risk in other ethnic groups might not be real.

Better systems are necessary to understand suicide and self-harm in marginalised groups (eg, ethnic and sexual minority groups, and Indigenous people), as these groups might benefit from tailored interventions. The development of such interventions might need to be trauma-informed and strengths-based. Most important of all, interventions need to meaningfully involve the marginalised communities themselves.

*A fully referenced version of this panel is available in the appendix (p 9).

physical pain),⁶ and there is some evidence that individuals who have repeatedly self-harmed have a higher pain threshold than those with no such history.³⁶ Suicidal thoughts are important, but not all individuals who express these thoughts will go on to act on them, and not all individuals who harm themselves will have expressed suicidal thoughts. However, factors such as plans to self-harm, harmful substance use, a history of self-harm, or exposure to self-harm in others might be implicated in the transition from ideation to attempt.^{37–39}

At a community and household level, several factors are associated with an increased risk of self-harm and suicide. These factors include economic resources (eg, poorer quality housing, unemployment, and fewer financial assets), knowledge resources (eg, lower levels of parental education^{40,41}), community and domestic violence,^{42,43} childhood adversity (OR for suicide attempt in those with four or more adversities vs no adversities: 30·15, 95% CI 14·73–61·67),⁴⁴ household alcohol use,⁴⁵ and bereavement^{46,47} (including bereavement by suicide).

Some global and societal factors linked with increased self-harm and suicide include physical and cognitive access to lethal means (eg, pesticides and guns),⁴⁸ gender and cultural norms,^{49,50} economic recessions,^{51,52} and stigma or discrimination towards particular groups of

people.⁵³ Our understanding of suicidal behaviour in marginalised groups is hindered by structural barriers (panel 2). Climate change is another key global risk factor for suicide and self-harm that is becoming increasingly important (panel 3).⁵⁴

In addition to a life course, societal, and global perspective, it is worth considering the importance of contributing factors at a population level. The population attributable fraction gives an estimate of the proportion of a condition or outcome that 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 (appendix p 7). An overall understanding of the factors that contribute to suicide and self-harm risk is important and can help to highlight areas to which prevention activities could be targeted.

Assessment**Clinical assessment**

Following an incident of self-harm, a sensitively conducted assessment that pays close attention to establishing rapport can be therapeutic for patients.⁵⁵ Patients emphasise the importance of feeling listened to,

Panel 3: Climate change, conflicts, and forced migration*

Climate change and its influence on health is of great concern. The effect is unequal and is disproportionately affecting populations in LMICs, where most suicide deaths occur. As the effects of climate change worsen, and extreme climatic events such as droughts, heatwaves, and floods become more common place, the resulting loss of life (ie, 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.

By 2050 there will be an estimated 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 are not more likely to die by suicide. A less direct effect of climate change can be seen in crop failure increases and yield decreases. An ecological analysis based on data from India suggests that economic hardships induced by climate change might be associated with increased suicide.

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

*A fully referenced version of this panel is available in the appendix (p 3).

and these assessments can lead to better engagement with future treatment. Although evidence on the benefits of assessment is mostly focused on self-harm, many of the same principles will apply to patients presenting with suicidal thoughts. Confidentiality is an important issue, but the potential value of involving family members or trusted others (with the patient's consent) should be emphasised.⁵⁶ At times the principles of confidentiality might need to be over-riden in the interest of patient safety; for example, in life threatening situations.⁵⁷

The nature and context of the self-harm should be explored during clinical assessment. A mental state examination should be done to identify psychiatric disorders that can then be treated. Collateral histories might be useful to gain a better understanding of suicidal intent. However, clinicians must be aware that intent can fluctuate and is not always a reliable indicator of future behaviour. Patients who are unable to or refuse to consent to assessment and treatment might 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,^{58,59} and relevant mental health legislation. A detailed guide to the general assessment of self-harm is beyond the scope of this Seminar but has been outlined elsewhere.⁶⁰ We would argue that all clinicians, regardless of speciality, should be able to undertake basic assessments. Of course, not all patients and clinical situations are the same. Some patients might have acute needs that need urgent attention.

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.^{61,62} Therefore, these assessments should 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. WHO's Mental Health Gap Action Programme has been recommended for use in non-specialist settings; however, its effectiveness in preventing suicide or self-harm has not been assessed.

Risk assessment

Risk assessments are in widespread use in mental health services. To predict future suicidal behaviour and allocate treatment, clinicians either categorise patients as at high, medium, or low risk of suicide, or score patients on a scale. However, current methods for assessing risk, such as unassisted clinician classification or the use of risk scales,^{63,64} are insufficiently accurate for this purpose.

The comparative rarity (in population terms) of suicide or repeat self-harm means the positive predictive values (ie, the proportion of patients assessed at high risk who go on to have adverse outcomes) of any classification or tool will always be low. Most patients classified as high risk will not die by suicide.⁶⁴ Importantly, false negatives result in treatment being withheld from patients classified as low risk who then die by suicide. The absolute number of suicide deaths is greater in the low-risk group because a larger proportion of patients are classified as low risk (the population paradox⁶⁵). Nearly 90% of mental health patients in the UK who died by suicide were rated by their clinical teams as at no risk or low risk of suicide when they were last seen.⁶⁶

In addition, patients who have undergone risk assessments report fear and anxiety regarding misclassification, the possibility of their freedoms being restricted through the use of unnecessary treatment,⁵⁵ and a lack of personal involvement in the process.⁶⁶ Risk stratification and the use of risk assessment methods might be even less useful in LMICs where the incidence of repeat self-harm and suicide after self-harm is much lower than in HICs.⁶⁷

Risk scales are a popular form of risk assessment that can provide a structured and transparent approach. The US National Strategy for Suicide Prevention and the

European Psychiatric Association support the use of risk scales in conjunction with psychiatric assessments.^{68,69} However, current scales do not account for the complex and rapidly fluctuating nature of risk. The use of these scales in clinical settings is highly variable; for example, a UK study found 156 different suicide risk methods in use in mental health services.⁶⁶ A tick-box approach can impede therapeutic engagement.⁷⁰ In view of these factors and their poor predictive value, clinical guidelines from Australia and New Zealand⁷¹ and the UK⁷² advise against the use of risk scales in risk prediction and treatment allocation.

Several novel methods for risk assessment are currently being developed. The Implicit Association Test predicts suicidal behaviour by measuring mental associations between the concepts of life versus death and me versus other.^{73,74} Computerised adaptive tests are an individualised multidimensional 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.^{75,76} 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 might be subject to a range of biases.^{77,78} These new approaches might 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 method that was 100% accurate in terms of predicting categorical events would not predict 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.^{79,80} 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 on the basis of risk stratification.⁸¹

Intervention and prevention

Psychological interventions

Research suggests psychological interventions might be effective in preventing self-harm and suicide,^{82,83} although current evidence has substantial methodological limitations and is limited to HICs. Cognitive behavioural therapy and related treatments have the strongest evidence base for reducing suicidal ideation and repeat self-harm compared with treatment as usual.⁸² Dialectical behavioural therapy, an intensive psychological intervention that incorporates principles of cognitive behavioural therapy, mindfulness techniques, and a focus on acceptance and emotional regulation, seems to reduce self-harm and crisis service use.⁸⁴ Dialectical behavioural therapy might be

particularly helpful for individuals with long-standing emotional and interpersonal difficulties (some of whom might be classed as having a personality disorder).

There is growing interest in brief interventions and digital treatments because of their potential to improve access to care, particularly where resources are scarce. Brief interventions, which generally consist of brief contact, care coordination, safety planning, or other short-term therapies, have been associated with a reduction in suicidal behaviour in some studies; however, the evidence base is small.⁸⁵ Digital treatments for suicide and self-harm have shown promise.^{86–88} In samples that are mainly community-based, self-guided digital interventions using a range of therapeutic approaches were effective in reducing suicidal ideation when interventions focused directly on suicidality rather than depression.⁸⁷ However, it is 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 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.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.^{87,89} These safer prescribing principles apply to pharmacological treatments for underlying physical and mental health disorders. Close monitoring of adherence and side-effects in collaboration with the patient is essential.⁹⁰

Evidence from several studies, most of which were observational, suggests that antidepressants might reduce the risk of suicide.⁹¹ However, some research has found an association with increased risk of suicide-related outcomes in young people. The evidence base is far from complete, since many randomised trials exclude people at heightened risk of self-harm or suicide.^{11,91} Lithium has been associated with reduced suicide rates in people with bipolar disorder and depression, which might be a specific effect not seen with other drugs designed to stabilise mood.^{92–94} Intriguingly, ecological data suggest that amounts of naturally occurring lithium in drinking water might be inversely associated with rates of suicide.⁹⁵ Although clozapine has previously been associated with decreased rates of suicide in people with schizophrenia or schizoaffective disorders,⁹⁶ this reduction was not supported by a more recent systematic review.⁹⁷ There is preliminary evidence for the protective effect of opioid agonist treatment for people with and without opioid dependence.^{98,99} 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.¹⁰⁰

Panel 4: Internet*

Investigation into the association between internet use and suicidal behaviour is a new but rapidly expanding area of research. Most studies to date have been descriptive or cross-sectional, focusing on children and people younger than 25 years. Although some evidence suggests that high frequency of general internet use, internet addiction, and cyber-bullying might be associated with increased suicidal behaviour, studies that have considered other types of internet use (including social media) and have differentiated between groups of users show 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 happened 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 might not present to services, a sense of solidarity, community, and 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 for the regulation of self-harm-related online content. The involvement of such organisations should help to ensure a considered approach, which maintains focus on suicide prevention and minimises unintended consequences.

*A fully referenced version of this panel is available in the appendix (p 4).

Social interventions

Interventions that address social factors seldom investigate self-harm or suicide as an outcome. However, a small evidence base exists for the effect 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.¹⁰¹ Many intimate partner violence interventions are also associated with improvements in mental health outcomes.¹⁰² Findings on the use of 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.^{103,104}

Community health workers

Much of the published work on individual-level interventions is from HICs. In LMICs there is increasing

evidence for the use of task-sharing by community health workers to deliver mental health care. Community health workers have been tasked with delivering both standardised psychological and pharmacological treatments, and novel community-developed interventions, in a range of settings, including homes, health-care facilities, places of worship, and community centres.¹⁰⁵

Training

Experiences of clinical care following self-harm can influence a patient's likelihood of repeating the behaviour.^{55,106} The importance of the skills, knowledge, and attitudes of staff conducting the 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.¹⁰⁷

What content should be included in training packages? In the UK, a series of competency frameworks have been devised that list key knowledge, skills, and attitudes, and are intended to inform the development of training curricula and assessment of training and practice.¹⁰⁸ Local-needs assessments of health-care 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 suggest that, in the year before death, approximately 80% of individuals who die by suicide make contact with primary care, 40% with emergency departments, and 30% with specialist mental health services.¹⁰⁹⁻¹¹¹ A focus on safety in services can reduce suicide rates—a key principle is system-wide change across services, rather than focusing 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 were associated with a reduction in suicide across all mental health services in England and Wales.¹¹² Furthermore, the organisational context was important. For example, service changes had more of an effect in organisations with a stable workforce compared with a high staff turnover.¹¹³ Multicomponent interventions across health and community settings in HICs also show promise.¹¹⁴ There is clearly a role for health services in suicide prevention in LMICs, but the exact role is less certain.

Public health approaches

Restricting access to lethal means is a key area of focus¹¹⁵ and is effective because many suicide attempts are unplanned and might involve a last-minute decision. People attempting suicide or self-harm might be ambivalent about their intent, and so restricting access to means can buy time, during which suicidal thoughts

Panel 5: COVID-19*

There is great concern over the effects of the COVID-19 pandemic and associated public health measures on mental health, particularly in relation to suicide and self-harm. Balancing efforts to control virus transmission with deaths arising from the indirect effects of lockdown measures on suicide and self-harm is challenging. Evidence from 21 high-income and upper-middle-income countries indicates that in the early months of the pandemic, suicide rates declined or remained unchanged but, in Japan, suicide rates seemed to increase later in 2020 after an initial decline. Surveillance systems for suicide are patchy in low-income and middle-income countries, but emerging evidence from India shows a decrease in suicide during lockdown. This decline in suicide might be a consequence of increased social cohesion (societies pulling together in times of collective adversity) and increased supervision within households. In some countries the decline might also be attributed to policies that have mitigated possible negative effects (eg, increased economic support). Similar reductions in self-harm presentations to health services have been recorded in several countries, although not all. This information needs to be interpreted with caution, as a reduction in self-harm presentations to health services might reflect concerns over contracting the virus and not reflect a reduction in self-harm rates. There are few community-based surveillance systems worldwide, but evidence from the UK suggests that self-reported self-harm rates have remained the same, and calls to crisis hotlines have increased.

Although population-level rates of self-harm and suicide during the early months of the pandemic seem to have declined, this overall picture masks important differences in experiences for subgroups of people. For example, evidence suggests that the risk of suicide in individuals from minority ethnic groups increased in the early part of the pandemic, whereas their majority ethnic counterparts have seen a decline in suicide risk. Similarly, rates of self-harm presentation to hospitals during the pandemic might have increased in more deprived areas when compared with affluent areas in Australia.

The research evidence to date has indicated no rise in suicide and self-harm, at least in the short term. The longer-term effects of the pandemic and associated public health measures are still unknown. The effect of large-scale disruption to education and health-care systems is unclear. There is emerging work suggesting that survivors of COVID-19 infection have increased psychiatric morbidity. Follow-up of these patients needs to be carefully managed to ensure no subsequent risk of suicide or self-harm. Previous research has suggested that economic recessions are linked with increased suicide. Mitigating the effect of the economic fall-out of the pandemic on the wellbeing 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.

*A fully referenced version of this panel is available in the appendix (p 13).

might subside. Pesticides account for about a fifth of global suicide deaths,¹¹⁶ and national bans of the most toxic formulations lead to falls in suicide rates.⁴⁸ For example, in Sri Lanka an estimated 93 000 lives were saved over two decades.¹¹⁷ Legislation restricting access to other means such as firearms and frequently used locations¹¹⁸ has also been associated with decreased suicide rates.¹¹⁵ Further cross-national regulation of access to lethal means has the potential to reduce global suicide rates.¹¹⁵

Traditional and newer media also have a key role in suicide prevention. News reporting of celebrity suicide might be associated with an increase in population suicide rates.¹¹⁹ Similarly, suicidal behaviour increases in relation to fictional portrayals on streaming services.¹²⁰ Possible mechanisms include identification with the deceased, social learning, or enhanced cognitive availability. When methods are reported, a greater increase in use of that reported method has been noted.¹¹⁹ Guidelines have been developed to promote responsible reporting in the media, and responsible discussions about suicide on social media.¹²¹ 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.¹²² Panel 4 outlines the much-discussed role of the internet in relation to suicidal behaviour.

School-based strategies might also be effective. Several randomised controlled trials of interventions focused on improving mental health awareness or promotion of good behaviour have found a reduction in suicidal ideation and attempts.^{115,123} However, when professionals are delivering interventions, they need to be appropriately resourced and properly trained. A large trial from India showed that a multicomponent health promotion intervention in schools improved psychological and behavioural outcomes when delivered by lay counsellors, but not when delivered by teachers.¹²⁴ In fact, there was some evidence that teacher-led delivery was associated with increased risk of self-harm.

Substance misuse policies are frequently missing from local and national suicide prevention strategies, despite the decreased suicide risk associated with both restrictive alcohol policies and engagement in substance misuse treatment.¹²⁵

Community interventions to shift social norms, and thereby address risk factors for suicide, are likely to be useful in suicide prevention, although their effect 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.^{126,127} Successful interventions have involved a multilevel, 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 widely discussed in publications. Economic recessions and high unemployment rates are associated with higher rates of suicide.^{51,52,128} Increased welfare spending might mitigate these effects, leading some researchers to suggest that “recessions hurt but austerity kills”.¹²⁹ Many of these factors have been brought into sharper focus with the COVID-19 pandemic, but the pandemic’s potential effect on suicidal behaviour is much broader than its economic effects—it has also had disruptive effects on education and health services (panel 5).

Postvention

Providing timely care to people bereaved after a suicide death 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 long lasting. People affected are at increased risk of suicidal behaviour and adverse physical health outcomes.^{130,131} Suicide bereavement is an area of increasing academic and policy activity, but research showing the effectiveness of interventions that support people who have been bereaved is currently scarce.^{132,133} Nonetheless, preliminary evidence indicates that interventions involving a series of facilitated educational, supportive, or therapeutic sessions might be helpful.¹³² Individuals who have been bereaved through suicide can experience stigma and isolation; therefore acknowledgment and proactive offers of support from health-care professionals are highly valued.^{134,135} A number of practical resources are available for people who are bereaved by suicide.¹³⁶

The suicide of a patient can be profoundly emotionally, professionally, and practically challenging for health-care professionals. However, until the last few years, little attention has been given to providing support to health-care professionals and encouraging self-care following such an experience.^{137,138} There is increasing recognition that improvements in this area will ultimately lead to better patient care, and resources are now being developed for clinicians who are affected by a patient suicide or are in contact with people who have been bereaved.^{139,140}

National strategies

National strategies for suicide prevention draw together initiatives focused on individuals and societies, but a long-term approach to suicide prevention is also essential. The Sustainable Development Goals for 2030, agreed by the

UN General Assembly in 2015, include suicide mortality as an indicator of health and wellbeing.¹⁴¹ National suicide prevention strategies are essential in attracting political attention, identifying local challenges, galvanising efforts, and promoting accountability. In less than a decade, at least 38 countries have developed suicide prevention strategies. WHO provides examples of strategies from every world region to show the diversity of approaches and inspire further development.¹⁴²

Conclusion

Suicide is an individual tragedy as well as a global concern. Suicide prevention must encompass both a clinical and societal focus. Every health professional has a crucial part 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 effect 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 poor, further aetiological research might be helpful. Health services should aim to implement what is known, and provide high quality care for every patient who presents with suicidal behaviour.

Contributors

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References

- 1 WHO. Suicide worldwide in 2019: global health estimates. Geneva: World Health Organization, 2021.
- 2 Global Burden of Disease Collaborative Network. Global Burden of Disease study 2019 (GBD 2019) results. Seattle, WA: Institute for Health Metrics and Evaluation, 2020.
- 3 Gunnell D, Appleby L, Arensman E, et al. Suicide risk and prevention during the COVID-19 pandemic. *Lancet Psychiatry* 2020; 7: 468–71.

- 4 Carroll R, Metcalfe C, Gunnell D. Hospital presenting self-harm and risk of fatal and non-fatal repetition: systematic review and meta-analysis. *PLoS One* 2014; **9**: e89944.
- 5 Cho SE, Na KS, Cho SJ, Im JS, Kang SG. Geographical and temporal variations in the prevalence of mental disorders in suicide: systematic review and meta-analysis. *J Affect Disord* 2016; **190**: 704–13.
- 6 Calati R, Laglaoui Bakhiyi C, Artero S, Ilgen M, Courtet P. The impact of physical pain on suicidal thoughts and behaviors: meta-analyses. *J Psychiatr Res* 2015; **71**: 16–32.
- 7 Ahmedani BK, Westphal J, Autio K, et al. Variation in patterns of health care before suicide: a population case-control study. *Prev Med* 2019; **127**: 105796.
- 8 Quinlivan LM, Gorman L, Littlewood DL, et al. 'Relieved to be seen'-patient and carer experiences of psychosocial assessment in the emergency department following self-harm: qualitative analysis of 102 free-text survey responses. *BMJ Open* 2021; **11**: e044434.
- 9 WHO. Preventing suicide—a global imperative. Geneva: World Health Organization, 2014.
- 10 Cerel J, Brown MM, Maple M, et al. How many people are exposed to suicide? Not six. *Suicide Life Threat Behav* 2019; **49**: 529–34.
- 11 Kapur N, Goldney R. Suicide prevention. Oxford: Oxford University Press, 2019.
- 12 Office for National Statistics. Suicides in England and Wales: 2020 registrations. 2021. <https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/bulletins/suicidesintheunitedkingdom/2020registrations#suicide-patterns-by-age> (accessed April 28, 2022).
- 13 Patel V, Ramasundarahettige C, Vijayakumar L, et al. Suicide mortality in India: a nationally representative survey. *Lancet* 2012; **379**: 2343–51.
- 14 Naghavi M. Global, regional, and national burden of suicide mortality 1990 to 2016: systematic analysis for the Global Burden of Disease study 2016. *BMJ* 2019; **364**: 194.
- 15 Office of National Statistics. Suicides in England and Wales: 2019 registrations. 2020. <https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/bulletins/suicidesintheunitedkingdom/2019registrations#suicide-patterns-by-age> (accessed June 22, 2021).
- 16 Hong Kong Jockey Club Centre for Suicide Research and Prevention. Method used in completed suicide in Hong Kong 1999–2019. 2020. <https://csrj.hku.hk/statistics/> (accessed June 22, 2021).
- 17 National Institute of Health. Suicide. 2021. <https://www.nlm.nih.gov/health/statistics/suicide> (accessed June 22, 2021).
- 18 Mishara BL, Weisstub DN. The legal status of suicide: a global review. *Int J Law Psychiatry* 2016; **44**: 54–74.
- 19 Vos T, Lim SS, Abbafati C, et al. Global burden of 369 diseases and injuries in 204 countries and territories, 1990–2019: a systematic analysis for the Global Burden of Disease Study 2019. *Lancet* 2020; **396**: 1204–22.
- 20 Carr MJ, Ashcroft DM, Kontopantelis E, et al. The epidemiology of self-harm in a UK-wide primary care patient cohort, 2001–2013. *BMC Psychiatry* 2016; **16**: 53.
- 21 McManus S, Gunnell D, Cooper C, et al. Prevalence of non-suicidal self-harm and service contact in England, 2000–14: repeated cross-sectional surveys of the general population. *Lancet Psychiatry* 2019; **6**: 573–81.
- 22 Geulayov G, Casey D, McDonald KC, et al. Incidence of suicide, hospital-presenting non-fatal self-harm, and community-occurring non-fatal self-harm in adolescents in England (the iceberg model of self-harm): a retrospective study. *Lancet Psychiatry* 2018; **5**: 167–74.
- 23 Pearson M, Metcalfe C, Jayamanne S, et al. Effectiveness of household lockable pesticide storage to reduce pesticide self-poisoning in rural Asia: a community-based, cluster-randomised controlled trial. *Lancet* 2017; **390**: 1863–72.
- 24 Cramer RJ, Kapusta ND. A social-ecological framework of theory, assessment, and prevention of suicide. *Front Psychol* 2017; **8**: 1756.
- 25 Erlangsen A, Appadurai V, Wang Y, et al. Genetics of suicide attempts in individuals with and without mental disorders: a population-based genome-wide association study. *Mol Psychiatry* 2020; **25**: 2410–21.
- 26 Turecki G. The molecular bases of the suicidal brain. *Nat Rev Neurosci* 2014; **15**: 802–16.
- 27 Steinberg LJ, Mann JJ. Abnormal stress responsiveness and suicidal behavior: a risk phenotype. *Biomark Neuropsychiatry* 2020; **2**: 100011.
- 28 Szücs A, Szanto K, Aubry JM, Dombrowski AY. Personality and suicidal behavior in old age: a systematic literature review. *Front Psychiatry* 2018; **9**: 128.
- 29 O'Connor RC, Nock MK. The psychology of suicidal behaviour. *Lancet Psychiatry* 2014; **1**: 73–85.
- 30 Richardson C, Robb KA, O'Connor RC. A systematic review of suicidal behaviour in men: a narrative synthesis of risk factors. *Soc Sci Med* 2021; **276**: 113831.
- 31 Qin P, Agerbo E, Mortensen PB. Suicide risk in relation to socioeconomic, demographic, psychiatric, and familial factors: a national register-based study of all suicides in Denmark, 1981–1997. *Am J Psychiatry* 2003; **160**: 765–72.
- 32 Milner A, Spittal MJ, Pirkis J, LaMontagne AD. Suicide by occupation: systematic review and meta-analysis. *Br J Psychiatry* 2013; **203**: 409–16.
- 33 Duarte D, El-Hagrassy MM, Couto TCE, Gurgel W, Fregni F, Correa H. Male and female physician suicidality: a systematic review and meta-analysis. *JAMA Psychiatry* 2020; **77**: 587–97.
- 34 Ferrari AJ, Norman RE, Freedman G, et al. The burden attributable to mental and substance use disorders as risk factors for suicide: findings from the Global Burden of Disease Study 2010. *PLoS One* 2014; **9**: e91936.
- 35 Gray HM, Edson TC, Nelson SE, Grossman AB, LaPlante DA. Association between gambling and self-harm: a scoping review. *Addict Res Theory* 2021; **29**: 183–95.
- 36 Kirtley OJ, O'Carroll RE, O'Connor RC. Pain and self-harm: a systematic review. *J Affect Disord* 2016; **203**: 347–63.
- 37 Nock MK, Borges G, Bromet EJ, Cha CB, Kessler RC, Lee S. The epidemiology of suicide and suicidal behavior. In: Nock MK, Borges G, Ono Y, eds. *Suicide: Global perspectives from the WHO World Mental Health Surveys*. Cambridge: Cambridge University Press, 2012: 5–32.
- 38 Mars B, Heron J, Klonsky ED, et al. Predictors of future suicide attempt among adolescents with suicidal thoughts or non-suicidal self-harm: a population-based birth cohort study. *Lancet Psychiatry* 2019; **6**: 327–37.
- 39 Chan LF, Shamsul AS, Maniam T. Are predictors of future suicide attempts and the transition from suicidal ideation to suicide attempts shared or distinct: a 12-month prospective study among patients with depressive disorders. *Psychiatry Res* 2014; **220**: 867–73.
- 40 Knipe DW, Carroll R, Thomas KH, Pease A, Gunnell D, Metcalfe C. Association of socio-economic position and suicide/attempted suicide in low and middle income countries in South and South-East Asia—a systematic review. *BMC Public Health* 2015; **15**: 1055.
- 41 Cairns J-M, Graham E, Bambra C. Area-level socioeconomic disadvantage and suicidal behaviour in Europe: a systematic review. *Soc Sci Med* 2017; **192**: 102–11.
- 42 Devries KM, Mak JY, Bacchus LJ, et al. Intimate partner violence and incident depressive symptoms and suicide attempts: a systematic review of longitudinal studies. *PLoS Med* 2013; **10**: e1001439.
- 43 McLaughlin J, O'Carroll RE, O'Connor RC. Intimate partner abuse and suicidality: a systematic review. *Clin Psychol Rev* 2012; **32**: 677–89.
- 44 Hughes K, Bellis MA, Hardcastle KA, et al. The effect of multiple adverse childhood experiences on health: a systematic review and meta-analysis. *Lancet Public Health* 2017; **2**: e356–66.
- 45 Gupta A, Priya B, Williams J, et al. Intra-household evaluations of alcohol abuse in men with depression and suicide in women: a cross-sectional community-based study in Chennai, India. *BMC Public Health* 2015; **15**: 636.
- 46 Bylund Grenklo T, Kreicbergs U, Hauksdóttir A, et al. Self-injury in teenagers who lost a parent to cancer: a nationwide, population-based, long-term follow-up. *JAMA Pediatr* 2013; **167**: 133–40.
- 47 Pitman A, Rantell K, Marston L, King M, Osborn D. Perceived stigma of sudden bereavement as a risk factor for suicidal thoughts and suicide attempt: analysis of British cross-sectional survey data on 3387 young bereaved adults. *Int J Environ Res Public Health* 2017; **14**: E286.
- 48 Gunnell D, Knipe D, Chang S-S, et al. Prevention of suicide with regulations aimed at restricting access to highly hazardous pesticides: a systematic review of the international evidence. *Lancet Glob Health* 2017; **5**: e1026–37.

- 49 Andoh-Arthur J, Knizek BL, Osafo J, Hjelmeland H. Suicide among men in Ghana: the burden of masculinity. *Death Stud* 2018; **42**: 658–66.
- 50 Chandler A. Boys don't cry? Critical phenomenology, self-harm and suicide. *Sociol Rev* 2019; **67**: 1350–66.
- 51 Hawton K, Bergen H, Geulayov G, et al. Impact of the recent recession on self-harm: longitudinal ecological and patient-level investigation from the Multicentre Study of Self-harm in England. *J Affect Disord* 2016; **191**: 132–38.
- 52 Chang SS, Stuckler D, Yip P, Gunnell D. Impact of 2008 global economic crisis on suicide: time trend study in 54 countries. *BMJ* 2013; **347**: f5239.
- 53 Liu RT, Sheehan AE, Walsh RFL, Sanzari CM, Cheek SM, Hernandez EM. Prevalence and correlates of non-suicidal self-injury among lesbian, gay, bisexual, and transgender individuals: a systematic review and meta-analysis. *Clin Psychol Rev* 2019; **74**: 101783.
- 54 Watts N, Amann M, Arnell N, et al. The 2020 report of The Lancet Countdown on health and climate change: responding to converging crises. *Lancet* 2021; **397**: 129–70.
- 55 MacDonald S, Sampson C, Turley R, et al. Patients' experiences of emergency hospital care following self-harm: systematic review and thematic synthesis of qualitative research. *Qual Health Res* 2020; **30**: 471–85.
- 56 Department of Health and Social Care. Information sharing and suicide prevention: consensus statement. 2021. <https://www.gov.uk/government/publications/consensus-statement-for-information-sharing-and-suicide-prevention/information-sharing-and-suicide-prevention-consensus-statement> (accessed April 5, 2022).
- 57 Zero Suicide Alliance. Open about suicide—sharing information can save lives. 2021. <https://www.zerosuicidealliance.com/open-about-suicide-sharing-information-can-save-lives> (accessed April 5, 2022).
- 58 Wang DWL, Colucci E. Should compulsory admission to hospital be part of suicide prevention strategies? *BJPsych Bull* 2017; **41**: 169–71.
- 59 Walker S, Mackay E, Barnett P, et al. Clinical and social factors associated with increased risk for involuntary psychiatric hospitalisation: a systematic review, meta-analysis, and narrative synthesis. *Lancet Psychiatry* 2019; **6**: 1039–53.
- 60 Morris R, Kapur N, Byng R. Assessing risk of suicide or self harm in adults. *BMJ* 2013; **347**: f4572.
- 61 Steeg S, Emsley R, Carr M, Cooper J, Kapur N. Routine hospital management of self-harm and risk of further self-harm: propensity score analysis using record-based cohort data. *Psychol Med* 2018; **48**: 315–26.
- 62 Carroll R, Metcalfe C, Steeg S, et al. Psychosocial assessment of self-harm patients and risk of repeat presentation: an instrumental variable analysis using time of hospital presentation. *PLoS One* 2016; **11**: e0149713.
- 63 Chan MK, Bhatti H, Meader N, et al. Predicting suicide following self-harm: systematic review of risk factors and risk scales. *Br J Psychiatry* 2016; **209**: 277–83.
- 64 Quinlivan L, Cooper J, Davies L, Hawton K, Gunnell D, Kapur N. Which are the most useful scales for predicting repeat self-harm? A systematic review evaluating risk scales using measures of diagnostic accuracy. *BMJ Open* 2016; **6**: e009297.
- 65 Rose G, Khaw K-T, Marmot M. Rose's strategy of preventive medicine. Oxford: Oxford University Press, 2008.
- 66 Graney J, Hunt IM, Quinlivan L, et al. Suicide risk assessment in UK mental health services: a national mixed-methods study. *Lancet Psychiatry* 2020; **7**: 1046–53.
- 67 Knipe D, Metcalfe C, Hawton K, et al. Risk of suicide and repeat self-harm after hospital attendance for non-fatal self-harm in Sri Lanka: a cohort study. *Lancet Psychiatry* 2019; **6**: 659–66.
- 68 Wasserman D, Rihmer Z, Rujescu D, et al. The European Psychiatric Association (EPA) guidance on suicide treatment and prevention. *Eur Psychiatry* 2012; **27**: 129–41.
- 69 US Office of the Surgeon General, National Action Alliance for Suicide Prevention. 2012 national strategy for suicide prevention: goals and objectives for action. Washington, DC: US Department of Health & Human Services, 2012.
- 70 Stewart A, Hughes ND, Simkin S, et al. Navigating an unfamiliar world: how parents of young people who self-harm experience support and treatment. *Child Adolesc Ment Health* 2018; **23**: 78–84.
- 71 Carter G, Page A, Large M, et al. Royal Australian and New Zealand College of Psychiatrists clinical practice guideline for the management of deliberate self-harm. *Aust N Z J Psychiatry* 2016; **50**: 939–1000.
- 72 National Collaborating Centre for Mental Health. Self-harm: longer-term management. Manchester: National Institute for Health and Care Excellence, 2011.
- 73 Barnes SM, Bahraini NH, Forster JE, et al. Moving beyond self-report: implicit associations about death/life prospectively predict suicidal behavior among veterans. *Suicide Life Threat Behav* 2017; **47**: 67–77.
- 74 Tello N, Harika-Germaneau G, Serra W, Jaafari N, Chatard A. Forecasting a fatal decision: direct replication of the predictive validity of the suicide-implicit association test. *Psychol Sci* 2020; **31**: 65–74.
- 75 Gibbons RD, Kupfer DJ, Frank E, et al. Computerized adaptive tests for rapid and accurate assessment of psychopathology dimensions in youth. *J Am Acad Child Adolesc Psychiatry* 2020; **59**: 1264–73.
- 76 Gibbons RD, Kupfer D, Frank E, Moore T, Beiser DG, Boudreaux ED. Development of a computerized adaptive test suicide scale—the CAT-SS. *J Clin Psychiatry* 2017; **78**: 1376–82.
- 77 Gianfrancesco MA, Tamang S, Yazdany J, Schmajuk G. Potential biases in machine learning algorithms using electronic health record data. *JAMA Intern Med* 2018; **178**: 1544–47.
- 78 Coley RY, Johnson E, Simon GE, Cruz M, Shortreed SM. Racial/ethnic disparities in the performance of prediction models for death by suicide after mental health visits. *JAMA Psychiatry* 2021; **78**: 726–34.
- 79 Linthicum KP, Schafer KM, Ribeiro JD. Machine learning in suicide science: applications and ethics. *Behav Sci Law* 2019; **37**: 214–22.
- 80 Brown LA, Benhamou K, May AM, Mu W, Berk R. Machine learning algorithms in suicide prevention: clinician interpretations as barriers to implementation. *J Clin Psychiatry* 2020; **81**: 21.
- 81 Large MM, Ryan CJ, Carter G, Kapur N. Can we usefully stratify patients according to suicide risk? *BMJ* 2017; **359**: j4627.
- 82 Witt KG, Hetrick SE, Rajaram G, et al. Psychosocial interventions for self-harm in adults. *Cochrane Database Syst Rev* 2021; **4**: CD013668.
- 83 Erlangsen A, Lind BD, Stuart EA, et al. Short-term and long-term effects of psychosocial therapy for people after deliberate self-harm: a register-based, nationwide multicentre study using propensity score matching. *Lancet Psychiatry* 2015; **2**: 49–58.
- 84 DeCou CR, Comtois KA, Landes SJ. Dialectical behavior therapy is effective for the treatment of suicidal behavior: a meta-analysis. *Behav Ther* 2019; **50**: 60–72.
- 85 Doupnik SK, Rudd B, Schmutte T, et al. Association of suicide prevention interventions with subsequent suicide attempts, linkage to follow-up care, and depression symptoms for acute care settings: a systematic review and meta-analysis. *JAMA Psychiatry* 2020; **77**: 1021–30.
- 86 Stefanopoulou E, Hogarth H, Taylor M, Russell-Haines K, Lewis D, Larkin J. Are digital interventions effective in reducing suicidal ideation and self-harm? A systematic review. *J Ment Health* 2020; **29**: 207–16.
- 87 Torok M, Han J, Baker S, et al. Suicide prevention using self-guided digital interventions: a systematic review and meta-analysis of randomised controlled trials. *Lancet Digit Health* 2020; **2**: e25–36.
- 88 Arshad U, Farhat-Ul-Ain, Gauntlett J, Husain N, Chaudhry N, Taylor PJ. A systematic review of the evidence supporting mobile- and internet-based psychological interventions for self-harm. *Suicide Life Threat Behav* 2020; **50**: 151–79.
- 89 Hawton K, Bergen H, Simkin S, et al. Toxicity of antidepressants: rates of suicide relative to prescribing and non-fatal overdose. *Br J Psychiatry* 2010; **196**: 354–58.
- 90 D'Anci KE, Uhl S, Giradi G, Martin C. Treatments for the prevention and management of suicide: a systematic review. *Ann Intern Med* 2019; **171**: 334–42.
- 91 Mann JJ, Michel CA, Auerbach RP. Improving suicide prevention through evidence-based strategies: a systematic review. *Am J Psychiatry* 2021; **178**: 611–24.
- 92 Hayes JF, Pitman A, Marston L, et al. Self-harm, unintentional injury, and suicide in bipolar disorder during maintenance mood stabilizer treatment: a UK population-based electronic health records study. *JAMA Psychiatry* 2016; **73**: 630–37.

- 93 Song J, Sjölander A, Joas E, et al. Suicidal behavior during lithium and valproate treatment: a within-individual 8-year prospective study of 50,000 patients with bipolar disorder. *Am J Psychiatry* 2017; **174**: 795–802.
- 94 Smith KA, Cipriani A. Lithium and suicide in mood disorders: updated meta-review of the scientific literature. *Bipolar Disord* 2017; **19**: 575–86.
- 95 Memon A, Rogers I, Fitzsimmons SMDD, et al. Association between naturally occurring lithium in drinking water and suicide rates: systematic review and meta-analysis of ecological studies. *Br J Psychiatry* 2020; **217**: 667–78.
- 96 Hennen J, Baldessarini RJ. Suicidal risk during treatment with clozapine: a meta-analysis. *Schizophr Res* 2005; **73**: 139–45.
- 97 Vermeulen JM, van Rooijen G, van de Kerkhof MPJ, Sutherland AL, Correll CU, de Haan L. Clozapine and long-term mortality risk in patients with schizophrenia: a systematic review and meta-analysis of studies lasting 1–12·5 years. *Schizophr Bull* 2019; **45**: 315–29.
- 98 Serafini G, Adavastro G, Canepa G, et al. The efficacy of buprenorphine in major depression, treatment-resistant depression and suicidal behavior: a systematic review. *Int J Mol Sci* 2018; **19**: 15.
- 99 Molero Y, Zetterqvist J, Binswanger IA, Hellner C, Larsson H, Fazal S. Medications for alcohol and opioid use disorders and risk of suicidal behavior, accidental overdoses, and crime. *Am J Psychiatry* 2018; **175**: 970–78.
- 100 Witt K, Potts J, Hubers A, et al. Ketamine for suicidal ideation in adults with psychiatric disorders: a systematic review and meta-analysis of treatment trials. *Aust N Z J Psychiatry* 2020; **54**: 29–45.
- 101 Moore THM, Kapur N, Hawton K, Richards A, Metcalfe C, Gunnell D. Interventions to reduce the impact of unemployment and economic hardship on mental health in the general population: a systematic review. *Psychol Med* 2017; **47**: 1062–84.
- 102 Ogbe E, Harmon S, Van den Bergh R, Degomme O. A systematic review of intimate partner violence interventions focused on improving social support and/mental health outcomes of survivors. *PLoS One* 2020; **15**: e0235177.
- 103 Siette J, Cassidy M, Priebe S. Effectiveness of befriending interventions: a systematic review and meta-analysis. *BMJ Open* 2017; **7**: e014304.
- 104 Thompson R, Valenti E, Siette J, Priebe S. To befriend or to be a friend: a systematic review of the meaning and practice of “befriending” in mental health care. *J Ment Health* 2016; **25**: 71–77.
- 105 van Ginneken N, Chin WY, Lim YC, et al. Primary-level worker interventions for the care of people living with mental disorders and distress in low- and middle-income countries. *Cochrane Database Syst Rev* 2021; **8**: CD009149.
- 106 Dunster-Page C, Haddock G, Wainwright L, Berry K. The relationship between therapeutic alliance and patient’s suicidal thoughts, self-harming behaviours and suicide attempts: a systematic review. *J Affect Disord* 2017; **223**: 165–74.
- 107 de Beurs DP, de Groot MH, de Keijser J, van Duijn E, de Winter RF, Kerkhof AJ. Evaluation of benefit to patients of training mental health professionals in suicide guidelines: cluster randomised trial. *Br J Psychiatry* 2016; **208**: 477–83.
- 108 University College London, National Collaborating Centre for Mental Health. Self-harm and Suicide Prevention Competence Framework. 2018. <https://www.ucl.ac.uk/pals/research/clinical-educational-and-health-psychology/research-groups/core/competence-frameworks/self> (accessed June 25, 2021).
- 109 Walby FA, Myhre MØ, Kildahl AT. Contact with mental health services prior to suicide: a systematic review and meta-analysis. *Psychiatr Serv* 2018; **69**: 751–59.
- 110 Stene-Larsen K, Reneflot A. Contact with primary and mental health care prior to suicide: a systematic review of the literature from 2000 to 2017. *Scand J Public Health* 2019; **47**: 9–17.
- 111 Gairin I, House A, Owens D. Attendance at the accident and emergency department in the year before suicide: retrospective study. *Br J Psychiatry* 2003; **183**: 28–33.
- 112 While D, Bickley H, Roscoe A, et al. Implementation of mental health service recommendations in England and Wales and suicide rates, 1997–2006: a cross-sectional and before-and-after observational study. *Lancet* 2012; **379**: 1005–12.
- 113 Kapur N, Ibrahim S, While D, et al. Mental health service changes, organisational factors, and patient suicide in England in 1997–2012: a before-and-after study. *Lancet Psychiatry* 2016; **3**: 526–34.
- 114 Baker ST, Nicholas J, Shand F, Green R, Christensen H. A comparison of multi-component systems approaches to suicide prevention. *Australas Psychiatry* 2018; **26**: 128–31.
- 115 Zalsman G, Hawton K, Wasserman D, et al. Suicide prevention strategies revisited: 10-year systematic review. *Lancet Psychiatry* 2016; **3**: 646–59.
- 116 Mew EJ, Padmanathan P, Konradsen F, et al. The global burden of fatal self-poisoning with pesticides 2006–15: systematic review. *J Affect Disord* 2017; **219**: 93–104.
- 117 Knipe DW, Gunnell D, Eddleston M. Preventing deaths from pesticide self-poisoning—learning from Sri Lanka’s success. *Lancet Glob Health* 2017; **5**: e651–52.
- 118 Pirkis J, Too LS, Spittal MJ, Krysinaka K, Robinson J, Cheung YTD. Interventions to reduce suicides at suicide hotspots: a systematic review and meta-analysis. *Lancet Psychiatry* 2015; **2**: 994–1001.
- 119 Niederkrotenthaler T, Braun M, Pirkis J, et al. Association between suicide reporting in the media and suicide: systematic review and meta-analysis. *BMJ* 2020; **368**: m575.
- 120 Bridge JA, Greenhouse JB, Ruch D, et al. Association between the release of Netflix’s 13 Reasons Why and suicide rates in the United States: an interrupted time series analysis. *J Am Acad Child Adolesc Psychiatry* 2020; **59**: 236–43.
- 121 Robinson J, Teh Z, Lamblin M, Hill NTM, La Sala L, Thorn P. Globalization of the #chatsafe guidelines: using social media for youth suicide prevention. *Early Interv Psychiatry* 2020; **15**: 1409–13.
- 122 Pirkis J, Rossetto A, Nicholas A, Ftanou M, Robinson J, Reavley N. Suicide prevention media campaigns: a systematic literature review. *Health Commun* 2019; **34**: 402–14.
- 123 Wasserman D, Hoven CW, Wasserman C, et al. School-based suicide prevention programmes: the SEYLE cluster-randomised, controlled trial. *Lancet* 2015; **385**: 1536–44.
- 124 Shinde S, Weiss HA, Khandeparkar P, et al. A multicomponent secondary school health promotion intervention and adolescent health: an extension of the SEHER cluster randomised controlled trial in Bihar, India. *PLoS Med* 2020; **17**: e1003021.
- 125 Kalk NJ, Kelleher MJ, Curtis V, Morley KI. Addressing substance misuse: a missed opportunity in suicide prevention. *Addiction* 2019; **114**: 387–88.
- 126 Heymann J, Levy JK, Bose B, et al. Improving health with programmatic, legal, and policy approaches to reduce gender inequality and change restrictive gender norms. *Lancet* 2019; **393**: 2522–34.
- 127 Abramsky T, Devries K, Kiss L, et al. Findings from the SASA! study: a cluster randomized controlled trial to assess the impact of a community mobilization intervention to prevent violence against women and reduce HIV risk in Kampala, Uganda. *BMC Med* 2014; **12**: 122.
- 128 Oyesanya M, Lopez-Morinigo J, Dutta R. Systematic review of suicide in economic recession. *World J Psychiatry* 2015; **5**: 243–54.
- 129 Stuckler D, Basu S. The body economic: why austerity kills. New York, NY: Basic Books, 2013.
- 130 Maple M, Cerel J, Sanford R, Pearce T, Jordan J. Is exposure to suicide beyond kin associated with risk for suicidal behavior? A systematic review of the evidence. *Suicide Life Threat Behav* 2017; **47**: 461–74.
- 131 Spillane A, Larkin C, Corcoran P, Matvienko-Sikar K, Riordan F, Arensman E. Physical and psychosomatic health outcomes in people bereaved by suicide compared to people bereaved by other modes of death: a systematic review. *BMC Public Health* 2017; **17**: 939.
- 132 Andriessen K, Krysinaka K, Hill NTM, et al. Effectiveness of interventions for people bereaved through suicide: a systematic review of controlled studies of grief, psychosocial and suicide-related outcomes. *BMC Psychiatry* 2019; **19**: 49.
- 133 Wagner B, Hofmann L, Grafiadeli R. Psychological interventions for people bereaved by suicide: a systematic review. *Psychiatr Prax* 2021; **48**: 9–18.
- 134 Ross V, Kolves K, De Leo D. Exploring the support needs of people bereaved by suicide: a qualitative study. *Omega* 2021; **82**: 632–45.
- 135 Wainwright V, Cordingley L, Chew-Graham CA, et al. Experiences of support from primary care and perceived needs of parents bereaved by suicide: a qualitative study. *Br J Gen Pract* 2020; **70**: e102–10.
- 136 Support After Suicide Partnership. Help is at hand. 2021. <https://supportaftersuicide.org.uk/resource/help-is-at-hand/> (accessed June 21, 2021).

- 137 Castelli Dransart DA, Heeb J-L, Gulfi A, Gutjahr EM. Stress reactions after a patient suicide and their relations to the profile of mental health professionals. *BMC Psychiatry* 2015; **15**: 265.
- 138 Gibbons R, Brand F, Carbonnier A, et al. Effects of patient suicide on psychiatrists: survey of experiences and support required. *BJPsych Bull* 2019; **43**: 236–41.
- 139 Leane E, Cuvillier B, Vieux M, et al. The SUPPORT-S protocol study: a postvention program for professionals after patient or user suicide. *Front Psychol* 2020; **11**: 805.
- 140 Clark S, Smith N, Griesbach A, Rivers D, Kuliwaba A. Supporting general practitioners and practice staff after a patient suicide: a proposal for the development of a guideline for general practice. *Aust J Gen Pract* 2020; **49**: 261–68.
- 141 UN General Assembly. Transforming our world: the 2030 agenda for sustainable development. 2015. <https://sdgs.un.org/2030agenda> (accessed April 5, 2022).
- 142 WHO. National suicide prevention strategies: progress, examples and indicators. Geneva: World Health Organization, 2018.

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