Suicide prevention: reflections on progress during the past decade

Keith Hawton[1]
Jane Pirkis[2]

Professor Keith Hawton FMedSci
Professor Jane Pirkis PhD

Affiliations

1. Centre for Suicide Research, Department of Psychiatry, University of Oxford, Oxford, United Kingdom
2. Centre for Mental Health, Melbourne School of Population and Global Health, University of Melbourne, Melbourne, Victoria, Australia

Corresponding author

Professor Keith Hawton
Centre for Suicide Research
University of Oxford
Warneford Hospital
Oxford, OX3 7JX
UK

Phone: 07795835603; Email: keith.hawton@psych.ox.ac.uk

Word count

4706

References

96

Suicide prevention: reflections on progress during the past decade

Abstract

Interest in preventing suicides has increased greatly in recent years. In this article we consider general developments related to suicide prevention in countries across the world during the past decade since Lancet Psychiatry was first published. We then review specific advances that have occurred; first, in relation to public health initiatives, and secondly with regard to clinical developments. Finally, we examine some of the challenges that currently confront those responsible for designing and implementing suicide prevention measures.

The World Health Organisation (WHO) estimates that globally over 700,000 people die by suicide annually and emphasises the need for countries to have policies for suicide prevention.[1] This need is underlined by the huge burden of suicide for family members, friend, work colleagues and others who are close to with of those who die.[2] Since its inception in 2014, Lancet Psychiatry has had a strong focus on research on suicide and self-harm, having included 134 articles with 'suicide' in the title between 2014 and the end of 2023. This has also been reflected in the support provided by the editorial team for a Lancet Psychiatry Suicide Symposium as part of the Annual British Isles Research Workshop on Suicide and Self-harm held by the Centre for Suicide Research at the University of Oxford. This article is a review of progress that has been made over the past decade in relation to suicide prevention. We consider general developments concerning suicide prevention activities, specific suicide prevention initiatives, and relevant clinical advances. We also discuss ongoing and likely future challenges.

General developments

In 1996 the United Nations encouraged countries to develop national suicide prevention strategies.[3] The number of nations with such policies has increased markedly in recent years. This is likely in part to reflect the United Nations' Sustainable Development Goal of a reduction by a third of deaths from non-communicable diseases (including suicides)[4] and also the WHO target of a reduction in the global suicide rate by a third by 2030.[5] We are aware of 22 countries having such strategies in 2014, whereas by 2023 this had increased to 45. These strategies, while often differing quite considerably in emphasis, usually include a combination of public health and clinical approaches. In practice, the biggest reductions in suicides usually result from public health initiatives. Evaluation of the possible impact on suicides of countries having national suicide prevention strategies has proved challenging, including assessing whether specific components within strategies have been effective.[6,7] However, encouragingly, global estimates of annual numbers of suicides have decreased in recent years), with WHO statistics showing a reduction in global age-standardized suicide rates from 11.0 per 100,000 in 2010 to 9.0 in 2019.[8] There have been exceptions to these positive trends, including some countries experiencing rises in suicides in young people, especially young females.[8,9]

One novel development has been the introduction of World Suicide Prevention Day (September 10th), an initiative which began in 2003 and has become much more prominent in recent years. It is coordinated by the International Association for Suicide Prevention (https://www.iasp.info/). It has the aim of increasing public awareness of suicide and its prevention, focusing particularly on how those in distress can get help and how those who are concerned about someone can support them.

Historically, suicidal acts have been considered as criminal behaviour in many countries. This was the case in the United Kingdom until 1961. Over time an increasing number of countries have decriminalised suicide. During the past 10 years this has been the case, for example, for India, Pakistan and Singapore. However, several countries retain the criminal position of suicide (for example, Bangladesh, Uganda and Qatar). This is clearly an extremely important issue for humanitarian reasons. It is also highly significant for suicide prevention because where suicide is criminalised this is likely to have profound effects on the likelihood that people who are experiencing suicidal thoughts will seek help, the provision of help and, of course, enthusiasm for developing national (or local) suicide prevention strategies.

In the past few years there has been a focus on more rapid means of obtaining data on suicides. This is partly to address the delay in most countries of official suicide statistics becoming available, which is due to the time taken to investigate potential suicides by coroners or equivalent officials, and the complexity of the subsequent processes for assembling and reporting the data. This assembly of near real-time data on suicides has mostly been based on data collection through agencies dealing directly with unexpected deaths, especially police and medical officials, sometimes in collaboration with coroners or equivalent agencies.[10] Where such agencies are not usually responsible for final decisions about suicide verdicts, deaths thought to be due to suicide are referred to as 'suspected suicides' or 'probable suicides'.[10,11] The value of having such data was highlighted by the COVID-19 pandemic, at the beginning of which there were some dire predictions about its potential impact on suicide,[12] raising the possibility that public health measures to contain the impacts of the pandemic would be overwhelmed. Because of the difficulty of using official statistics to assess whether this was true, availability of near real-time data provided a basis for an international study which demonstrated that the COVID-19 pandemic did not have the feared impact on suicides across 21 (mostly high income) countries during the

initial months of the pandemic; indeed 12 countries had a decrease in suicides.[13] Using similarly sourced data, but for 33 countries (again mostly high income), a second study showed a similar pattern during the first nine to 15 months of the pandemic, with a few exceptions in specific sex/age groups.[14] The development of (near) real-time surveillance of suicides has been an important step that is likely to have considerable benefits for future research and policy evaluation, as well as identification of short-term rises in suicides and local suicide clusters.[11] While for some countries, such as Japan, the data represent the official suicide figures, unpublished evidence from some other countries where this is not the case indicate good concordance between real-time and official suicide statistics.

A major advance in both policy development and research on suicide prevention in recent years has been involvement of people with lived experience of suicide or self-harm. This includes input to the conceptual thinking behind projects, the actual design of the work, ongoing monitoring of progress, and consideration of results and authorship on outputs from the work. Particularly important contributions of people with lived experience are to the content of therapeutic interventions and also the development of components of evaluation of effectiveness that are most relevant to affected individauls.[15] An example of the latter might be encouragement in a trial of treatment for individuals who self-harm to focus less on repetition of self-harm as an outcome and more on measures of well-being and satisfaction with life.[16] Involvement of people with lived experience should where possible include representatives of groups at particular risk of self-harm or suicide, such as people who identify as lesbian, gay, bisexual, transgender or queer,[17] ethnic minorities, and, where relevant, first nation people.

Specific suicide prevention initiatives

One of the most effective approaches to preventing suicide is restriction of access to specific methods used for suicidal acts, especially those that are commonly employed.[18,19] In several low- and middle-income countries (LMICs) suicidal acts frequently involve ingestion of pesticides, with deaths often due to use of highly toxic pesticides. Such was the extent of this that in 2007 it was estimated that pesticide ingestion contributed approximately 30% of global suicides.[20] In recent years, removal of more toxic pesticides from sale has had major beneficial effects on population levels of suicide. This has been the case, for example, in Sri

Lanka[21] and more recently in China.[22] This has likely been a major contributor to the recent decrease in the WHO estimate of global suicides rates noted above. While such initiatives can clearly be effective, method substitution can limit their effectiveness, especially if emerging methods also have high case fatality rates. This may have been the case in India, where reduction of more toxic pesticides was associated with a very large decrease in rates of suicide involving this method, but a major increase in rates of suicides by hanging.[23]

Prevention of suicides that occur in public places, while these constitute somewhat fewer of overall suicides (10-15%), has long been a focus of attention. This has been partly due to the considerable preventability of many such deaths and also because of the impact they can have on those witnessing them. During the past decade, erection of barriers on bridges and cliffs popular for suicide by jumping has resulted in fewer deaths from those sites in, with limited increased use of other such sites in the same areas,[24,25] and increases in help-seeking where this has been an added component of the initiatives.[25] There has also been increased attention to prevention of suicides on rail networks. Data from Japan showed that installation of platform screen doors on a rail system reduced suicides at the platforms by 76%.[26] However, such installations are expensive, especially if their introduction to older rail systems is considered, and are largely only applicable to underground subway systems. Recently, attention has also been paid to training of railway staff to recognise people in distress and to offer help.

Economic downturn, unemployment and poverty can have major negative influences on suicide rates. Conversely, economic policies aimed at providing support for those most affected by these influences can help counter their impacts on suicide rates.[27] In Brazil, a cash transfers program was introduced as a suicide prevention measure in 2004. This allows families below certain income thresholds to receive supplementary income (with adherence to certain family public health requirements). The program was evaluated for 12 years until 2015 and this showed that those receiving support through the scheme had less than half the risk of suicide compared to those not benefiting from it.[28] This, and other examples,[29] show the importance of governments' economic policies in relation to suicide prevention.

It is well-recognised that certain types of news reporting on suicides can have deleterious effects leading to further suicides, especially when the reporting is dramatic or prominent,

details the suicide method used, or concerns a celebrity.[30] Most national suicide prevention strategies include emphasis on reporting suicides in ways that are less likely to contribute to further deaths. These have been accompanied by production of guidelines for the media, such as those from the International Association for Suicide Prevention and WHO.[31] These appear to have resulted in improved reporting.[32-34] However, reporting on suicides in some countries - especially LMICs – remains poor.[35,36]

In the past decade, increasing attention has been paid to positive aspects of reporting that might discourage suicide. In particular, stories of hope and recovery have been promoted, with some limited evidence of effectiveness on suicidal ideation.[37] The potential impact of broadcasting messages that encourage people who are suicidal to seek help and also messages that indicate that recovery from crises is possible has recently been shown powerfully in the USA. This was the increased use of a national suicide help-line and reduced national suicide numbers that followed the extensive broadcasting of a hip-hop song by Logic, which included a story of recovery from a suicidal crisis and had the help-line telephone number as the title of the song.[38]

The proliferation of social media in recent years has had major relevance to both promotion and prevention of suicide and self-harm. Evidence has accumulated showing that portrayal of suicidal acts online can influence such behaviour in others,[39] with imagery related to specific suicidal acts being an important mechanism.[40] The power of social media also offers potential for suicide prevention, such as through providing relevant information and promoting safety mechanisms. Recently, *#chatsafe* guidelines have been developed which aim to educate young people on how to safely communicate about suicide on social media. These have been shown to improve individuals' confidence in communicating about suicide online and responding to someone who is suicidal.[41,42] Specific interventions for people who have sought suicide-related information online offer another potential approach. Use of a single session intervention for such individuals delivered through Tumblr has been shown to reduce feelings of hopelessness and increase wish to stop self-harm in such young people.[43] Such interventions have the advantage of potentially being able to influence large numbers of individuals and also, with appropriate culturally-sensitive and other modifications, being applicable in LMICs. A further approach is to use official mechanisms to prevent transmission of potentially dangerous material online and to encourage closer collaboration

between online social media companies and national suicide prevention organisations, such has recently been implemented through the Online Safety Bill in the UK.[44] Evidence of the impact of such developments is awaited.

There is increasing evidence that suicides may occur in clusters, especially in young people.[45] Traditionally, such phenomena have mainly been considered in terms of time-and-space or point clusters, where multiple suicides occur over a short period of time in specific locations, either in the community or within institutions (e.g., schools and universities, psychiatric units, prisons). However, particularly with the advent of social media, temporal clustering of suicides occurring in geographically separated locations (even in different countries), referred to as mass clusters, has become more common. Guidance on addressing clusters has been developed in recent years.[46,47] Although such guidance seems to have improved the organisation of responses to suicide clusters, currently there is little evidence that this has prevented suicides, especially those occurring in mass clusters (for which organisation of a response can be extremely challenging).

The past decade has also seen an increasing focus on introduction of suicide prevention programmes in educational settings, particularly schools. This has partly been based on the fact that suicides and self-harm occur in such settings, but also on the potential longer-term benefits of such programmes. Some have had an emphasis on increasing mental health awareness and the need for both self-care and trying to help others who may be facing difficulties. Evidence of effectiveness has been found for the Youth Aware of Mental Health programme in terms of reducing suicidal thinking and self-harm.[48] Other programmes have been more specifically focussed on suicide. For example, Signs of Suicide in which students learn about suicide warning signs and are trained to seek help from adults for either themselves or friends with such signs. Attendance at these classes has been reported as being followed by a reduction in 'suicide attempts'.[49]

The past ten years have witnessed greater recognition of the impacts of suicide on family members, friends and colleagues of those who have died,[50] with more awareness of the increased suicide risk in those who are very directly affected.[51] This has resulted in considerable developments in several countries in provision of help and support for those who are bereaved. In the UK, for example, police attending deaths likely to have been due

to suicide will usually give family members and others copies of a supportive resource known as *Help is at Hand*.[52] Where relatives and others wish for it, the police will also supply contact details for local bereavement support organisations with special facilities for those bereaved by suicide. Some will facilitate actual referral to such organisations. Currently, however, in spite of evidence for benefits of bereavement support,[53] we do not know whether such interventions decrease the risk of suicide in the bereaved.

Clinical developments

Suicide is strongly associated with mental disorders,[54] and a substantial proportion of people who die by suicide are patients in current or recent psychiatric care at the time.[55] However, during the past decade there has been increasing recognition that predicting which individual patients with mental disorders are likely to die by suicide, whether by clinical judgement or the use of prediction scales, is nigh impossible.[56] This also applies to those who have self-harmed.[57] There are several reasons for this. First, the incidence of suicide is low, even in relatively high-risk groups. Second, the predictive power of variables, both alone and in combination, is poor. Third, the majority of suicides occur in patients rated as being at low or moderate risk.[58] For these reasons, policies on clinical care in the context of suicide prevention have been shifting in emphasis from focussing on patients who are assessed as being at greater risk (often erroneously), to ensuring that a combination of therapeutic approaches likely to improve patients' problems and individualised means for crisis management are delivered to all patients. This doesn't mean ignoring risk, but includes, first, focussing attention on addressing patients' immediate and longer-term problems and, second, safety planning.[59] The latter has been a particularly notable development in recent years.[60] It includes a collaborative planning process between clinicians and patients resulting in clear and modifiable plans to assist patients if they start to experience that a crisis may be developing. There is accumulating evidence from trials in both psychiatric services and emergency department settings that safety planning can reduce suicidal behaviour.[61-63]

There is an important relationship between non-fatal self-harm and subsequent suicide, for which there has been increased evidence in recent years in both adults[64] and children and adolescents.[65] This has contributed to greater attention in suicide prevention strategies

being focussed on clinical management of individuals presenting to hospital following self-harm, including their aftercare.[57] This includes efforts to ensure that as many such patients as possible receive a psychosocial assessment of their problems and needs by a mental health professional. Effective therapeutic interventions to be delivered as part of aftercare have been identified on the basis of systematic reviews of evidence from trials. In adults, this has focussed especially on short-term (4-10 sessions) provision of cognitive behavioural therapy-based interventions, which was shown in a systematic review to reduce repetition of self-harm and also to help reduce depression, hopelessness and suicidal ideation.[66] However, there are challenges in many countries to implementing this type of therapy, partly due to shortage of appropriately trained staff. In the same review, dialectical behaviour therapy (DBT) for people with a history of multiple episodes of self-harm was found to reduce frequency of repetition of self-harm. Evidence of effective therapeutic interventions in children and adolescents is less conclusive, except for DBT for adolescents.[67] However, this is only indicated for a subgroup of young people, particularly those who repeat self-harm in the context of emerging personality difficulties.

The association of suicidal thoughts and behaviours with certain neurodevelopmental disorders has received considerable attention in recent years. These include, for example, autism[68] and attention deficit hyperactivity disorder (ADHD).[69] While substantive evidence for methods of prevention of suicidal behaviour in these disorders is awaited, there is early support for reduced occurrence of suicidal acts in individuals with ADHD who are receiving medications commonly used for this condition.[70]

Considerable attention has recently been paid to potential anti-suicidal effects of treatment with ketamine, particularly in patients with suicidal ideation in the context of depression. There is evidence of short-term beneficial effects on suicidal ideation of ketamine administered intravenously.[71,72] Also, evidence from uncontrolled studies suggests that once weekly oral ketamine when given over a month may have a sustained positive impact on suicidal ideation.[73] However, currently it is not known whether this applies to suicidal behaviour.

There has been longstanding interest in the potential role of lithium in reducing risk of suicide and self-harm in people with bipolar disorder.[74] Recently two studies based on

national registry data, one from Sweden[75] and the other from Denmark,[76] have supported the role of lithium as an anti-suicidal agent compared with other mood stabilisers (as well as highlighting its general positive effects on progress of the disorder as assessed by relapse necessitating psychiatric hospital admission[76]). However, by contrast, general use of lithium for people with bipolar disorder has declined, at least in high income countries.[77,78] This suggests that this potential means of reducing the high risk of suicide in patients with bipolar disorder may not be being fully utilised.

Electro-convulsive therapy (ECT) is of clear benefit for people with treatment-resistant depression.[79] But evidence that it can prevent suicide has been lacking, perhaps partly due to the difficulty of conducting relevant trials and also the rarity of suicide even in such a high-risk group of patients. However, in a recent Canadian retrospective cohort study of hospitalised patients with depression in which propensity score matching was used to achieve matching with control patients, the risk of suicide in those receiving ECT was significantly reduced.[80] This provides support for the belief that many psychiatrists hold that ECT has a role in suicide prevention in severely depressed patients.[79]

Challenges

While there have clearly been some important advances in knowledge about suicide and in suicide prevention activities during the past 10 years, there remain several major challenges. Perhaps the most important is the inequality regarding suicide prevention activity between lower and higher income countries. While an estimated 77% of global suicides occur in LMICs,[8] suicide prevention policies within these countries are relatively limited, although things seem to be improving. If some of the contributors to suicide in these countries were tackled, major gains could be made. The impact of reducing availability of highly toxic pesticides provides one good example.

Evaluation of suicide prevention activities presents major challenges.[81] One is the relative infrequency of suicide, rather than more frequent related phenomena such as self-harm or suicidal ideation. This means that to be meaningful, studies usually must be large-scale. Also, it is difficult, often impossible, where suicide is the outcome measure to conduct investigations using parallel control groups because of the size of the population required.

Therefore, reliance is often placed on 'before-and-after' studies, where, for example, the occurrence of suicides after introduction of an initiative (e.g., a barrier on a bridge popular for suicide; withdrawal of toxic pesticides) is simply compared with the occurrence beforehand. Comparisons can where possible also be made with occurrence of suicides in other similar locations over the same period as that of the initiative. Even then, the periods involved in the comparisons often have to be several years in order to be able to detect an effect. A related approach, especially where the occurrence of suicide has been changing over time, is to project timelines based on data before introduction of an intervention to the period afterwards and then to compare with the actual temporal occurrence of suicides. This was used to assess two initiatives to try to prevent of poisoning suicides in the UK, the first being the withdrawal of co-proxamol, a particularly toxic analgesic,[82] and the other the introduction of smaller packs of paracetamol.[83]

Added complexities in evaluation of individual suicide prevention initiatives include that they usually do not occur in isolation from other prevention activities and also that temporal changes in suicide rates are influenced by a wide range of other and often powerful factors (e.g., disruptions to national economies). But opportunities to identify important suicide prevention influences can also sometimes result from major changes that occur for entirely unrelated reasons. Such was the case with regard to the very large beneficial impact on suicides in the UK in the 1960s and 1970s when the national gas supply gradually changed from toxic coal gas to non-toxic North Sea gas, resulting in an approximately one-third reduction in national suicide rates, use of domestic gas before this initiative having been the most frequent method of suicide in the UK.[84] A recent example has been the removal of railway level crossings in Victoria Australia to improve transport performance, which resulted in reduced suicides around these sites compared with those where level crossings remained.[85] Such serendipitous impacts can influence future suicide prevention activities.

Another challenge is that the primary focus in some national suicide prevention strategies is on clinical initiatives. While these are undoubtedly important, the biggest shifts in suicide numbers come from effective public health policies, especially those aimed at improving nations' mental health, tackling major drivers of suicidal behaviour, restricting access to commonly used methods of suicide, and encouraging positive methods of coping with adversity. Yet there has been limited attention to prevention related to some major public

health influences on suicide. One example is alcohol misuse.[86] Recent evidence from Scotland of benefits of a national minimum alcohol pricing policy on deaths[87] is an important indicator of a measure that could reduce suicides. Domestic violence and abuse is another major contributor to many suicides, especially those involving women, including in both higher income countries[88] and LMICs.[89] Improvements in the social status of women, especially in societies where discrepancies in social standing between the genders are very marked, would be likely to make a major contribution to reducing suicides related to domestic violence and abuse. But more immediate initiatives, such as increased provision of support and, where necessary, alternative accommodation for individuals under threat and their children, could also contribute to reducing the number of suicides from this cause.

In recent years the extent to which problems related to gambling influence many suicides, especially in men, has become apparent,[90] with ease of access to online gambling sites being a likely contributory factor. Preventing individuals getting into significant debt from gambling through size of betting restriction initiatives and provision of easily available help for those who recognise their betting may be getting out of may help reduce some of the more severe impacts of gambling on mental health and hence reduce this important contribution to suicidal behaviour. Loneliness is a further important factor associated with suicide. In developing policies to reduce loneliness these need to be designed taking account of differences in the likely links between loneliness and suicide risk according to gender, age, presence of psychiatric disorder and personal circumstances.[91,92]

The increasing suicide rate in the USA, which runs contrary to the overall global trend, and where over half of suicides in 2021 involved the use of firearms[93] naturally raises the question of why limiting firearm ownership is not a national priority in that country. Commercial interests, cultural factors and the influence of the firearm lobby are likely major explanations. However, viewed from outside the USA, this situation seems scandalous. The synthetic opioid crisis in the USA is likely to be a further contributor to the persistently high suicide rates, although distinguishing opioid misuse deaths from suicides can be challenging, raising the possibility that some such deaths recorded as accidental may in fact be suicides.[94]

Another challenge reflecting method availability is the emergence of novel methods of suicide, especially when these are promoted via the internet or traditional media.[95] National suicide prevention policies should encourage vigilance for such developments and efforts (including international collaboration) to mitigate their impact.

There are of course other likely contemporary contributors to population suicide rates, including the impacts of climate change and of mass migration, themselves strongly inter-related. Both of these growing factors are likely to contribute to feelings of despair, especially when the impact is loss of property, livelihood or hope for the future. While addressing these potentially massive factors is perhaps beyond the capacity of national suicide prevention policies, it is nonetheless important that we carefully monitor how these factors might influence suicide.

Finally, one special future challenge to suicide prevention efforts may be the increasing inclusion of persistent debilitating mental health problems in medically assisted death policies in some countries.[96] This is of course in contrast to suicidal behaviour being a criminal offence in some other countries. There is likely to be increasing debate about the extent to which implementation of medically assisted death interventions might be viewed as posing a challenge to the objectives of suicide prevention activities.

Conclusions

The past decade has been a time of increased attention to suicide prevention in many countries, with evidence that some initiatives have had substantial benefits. This should encourage greater attention to such activities internationally, especially in countries where suicide prevention has so far not been prioritised. This may become more possible as further countries decriminalise suicidal behaviour and as evidence grows regarding effective strategies. Given the complexity of factors that may contribute to suicide, including, for example, social, economic, interpersonal, mental health and media influences, development of suicide prevention policies needs to include 'whole of government' collaboration, as there are no departments where input will not be appropriate. It is also crucial that specific suicide prevention strategies are carefully evaluated in terms of both implementation and effectiveness. While the latter can be particularly challenging, it is clearly highly important,

not only in terms of establishing if specific strategies in a country have resulted in lives saved, but also in helping illuminate what might be effective in other countries. Experience, including during the past decade, has also highlighted the fact that new challenges to suicide prevention are very likely to arise and that therefore planning of prevention activities needs to be a continuous process, with ongoing careful monitoring of evolving trends and thoughtful development of likely prevention initiatives.

Acknowledgments

We thank Dr Angela Clapperton and Manuel Canal Rivero for their assistance in accessing WHO figures for suicides globally and for information on the numbers of countries with national suicide prevention strategies. We also thank Dr Rupert McShane for his advice on evidence regarding ketamine treatment for people who are suicidal.

Conflict of interest

KH is a member of the National Suicide Prevention Strategy for England Advisory Group. JP is scientific adviser to Australia's National Suicide Prevention Office which is developing the new National Suicide Prevention Strategy.

References

1. World Health Organization. Suicide Worldwide in 2019: Global Health Estimates. Geneva: World Health Organization, 2021.
2. Pitman A, Osborn D, King M, Erlangsen A. Effects of suicide bereavement on mental health and suicide risk. *Lancet Psychiatry* 2014; **1**(1): 86-94.
3. United Nations Department for Policy Coordination and Sustainable Development. Prevention of Suicide: Guidelines for the Formulation and Implementation of National Strategies. New York: United Nations, 1996.
4. United Nations Department of Economic and Social Affairs. Sustainable Development. 2023. https://sdgs.un.org/goals (accessed 24/03/2024).
5. World Health Organization. Comprehensive Mental Health Action Plan 2013-2030. Geneva: World Health Organization, 2021.
6. Schlichthorst M, Reifels L, Spittal M, et al. Evaluating the effectiveness of components of national suicide prevention strategies: An interrupted time series analysis *Crisis* 2022.
7. Sinyor M, Ming Chan PP, Niederkrotenthaler T, Scott V, Platt S. The development, progress, and impact of national suicide prevention strategies worldwide. *Crisis* 2024.
8. World Health Organization Global Health Observatory (GHO). Suicide rate estimates, age-standardized, estimates by WHO region. 2024. https://apps.who.int/gho/data/view.main.MHSUICIDEASDRREGv?lang=en. (accessed 24/03/2024).
9. Bould H, Mars B, Moran P, Biddle L, Gunnell D. Rising suicide rates among adolescents in England and Wales. *Lancet* 2019; **394**(10193): 116-7.
10. Benson R, Rigby J, Brunsdon C, et al. Real-time suicide surveillance: Comparison of international surveillance systems and recommended best practice. *Archives of Suicide Research* 2022.
11. Marzano L, Norman H, Sohal B, Hawton K, Mann R. Police-led real-time surveillance system for suspected suicides in Great Britain. *BMJ mental health* 2023; **26**(1).
12. Marzano L, Hawley M, Fraser L, Lainez Y, Marsh J, Hawton K. Media coverage and speculation about the impact of the COVID-19 pandemic on suicide: A content analysis of UK news. *BMJ Open* 2023; **13**(2): e065456.
13. **Pirkis J**, John A, Shin S, et al. Suicide trends in the early months of the COVID-19 pandemic: An interrupted time-series analysis of preliminary data from 21 countries. *Lancet Psychiatry* 2021; **8**(7): 579-88.

14. **Pirkis J**, Gunnell D, Shin S, et al. Suicide numbers during the first 9-15 months of the COVID-19 pandemic compared with pre-existing trends: An interrupted time series analysis in 33 countries. *EClinicalMedicine* 2022; **51**: 101573.
15. Wright L, Lopez Chemas N, Cooper C. Lived experience codesign of self-harm interventions: A scoping review. *BMJ Open* 2023; **13**(12): e079090.
16. Owens C, Fox F, Redwood S, et al. Measuring outcomes in trials of interventions for people who self-harm: Qualitative study of service users' views. *BJPsych open* 2020; **6**(2): e22.
17. Marchi M, Arcolin E, Fiore G, et al. Self-harm and suicidality among LGBTIQ people: A systematic review and meta-analysis. *International Review of Psychiatry* 2022; **34**(3-4): 240-56.
18. Florentine J, Crane C. Suicide prevention by limiting access to methods: A review of theory and practice. *Social Science and Medicine* 2010; **70**(10): 1626-32.
19. Hawton K. Restricting access to methods of suicide: Rationale and evaluation of this approach to suicide prevention. *Crisis* 2007; **28**: 4-9.
20. Gunnell D, Eddleston M, Phillips M, Konradsen F. The global distribution of fatal pesticide self-poisoning: Systematic review. *BMC Public Health* 2007; **7**.
21. Knipe D, Gunnell D, Eddleston M. Preventing deaths from pesticide self-poisoning: Learning from Sri Lanka's success. *Lancet Global Health* 2017; **5**(7): e651-e2.
22. Yan YF, Jiang YY, Liu R, et al. Impact of pesticide regulations on mortality from suicide by pesticide in China: An interrupted time series analysis. *Frontiers in Psychiatry* 2023; **14**.
23. Arya V, Page A, Gunnell D, Armstrong G. Changes in method specific suicide following a national pesticide ban in India (2011–2014). *Journal of Affective Disorders* 2021; **278**: 592-600.
24. Pirkis J, Spittal M, Cox G, Robinson J, Cheung YTD, Studdert D. The effectiveness of structural interventions at suicide hotspots: A meta-analysis. *International Journal of Epidemiology* 2013; **42**(2): 541-8.
25. Pirkis J, Too LS, Spittal M, Krysinska K, Robinson J, Cheung YTD. Interventions to reduce suicides at suicide hotspots: A systematic review and meta-analysis. *Lancet Psychiatry* 2015; **2**(11): 994-1001.
26. Ueda M, Sawada Y, Matsubayashi T. The effectiveness of installing physical barriers for preventing railway suicides and accidents: Evidence from Japan. *Journal of Affective Disorders* 2015; **178**: 1-4.
27. Stack S. Contributing factors to suicide: Political, social, cultural and economic. *Preventive Medicine* 2021; **152**(Pt 1): 106498.

28. Machado DB, Williamson E, Pescarini JM, et al. Relationship between the Bolsa Família national cash transfer programme and suicide incidence in Brazil: A quasi-experimental study. *PLoS Medicine* 2022; **19**(5): e1004000.
29. Sinyor M, Silverman M, Pirkis J, Hawton K. Financial downturn, unemployment, and government responses. Submitted.
30. Sisask M, Värnik A. Media roles in suicide prevention: A systematic review. *International Journal of Environmental Research and Public Health* 2012; **9**(1): 123-38.
31. World Health Organization and International Association for Suicide Prevention. Preventing Suicide: A Resource for Media Professionals. Geneva: World Health Organization, 2023.
32. Marzano L, Fraser L, Scally M, Farley S, Hawton K. News coverage of suicidal behavior in the United Kingdom and the Republic of Ireland. *Crisis* 2018; **39**(5): 386-96.
33. McTernan N, Spillane A, Cully G, Cusack E, O'Reilly T, Arensman E. Media reporting of suicide and adherence to media guidelines. *International Journal of Social Psychiatry* 2018; **64**(6): 536-44.
34. Pirkis J, Dare A, Blood RW, et al. Changes in media reporting of suicide in Australia between 2000/01 and 2006/07. *Crisis* 2009; **30**(1): 25-33.
35. Arafat SMY, Khan M, Niederkrotenthaler T, Ueda M, Armstrong G. Assessing the quality of media reporting of suicide deaths in Bangladesh against World Health Organization guidelines. *Crisis* 2020; **41**(1): 47-53.
36. Armstrong G, Vijayakumar L, Niederkrotenthaler T, et al. Assessing the quality of media reporting of suicide news in India against World Health Organization guidelines: A content analysis study of nine major newspapers in Tamil Nadu. *Australian and New Zealand Journal of Psychiatry* 2018; **52**(9): 856-63.
37. Niederkrotenthaler T, Till B, Kirchner S, et al. Effects of media stories of hope and recovery on suicidal ideation and help-seeking attitudes and intentions: Systematic review and meta-analysis. *Lancet Public Health* 2022; **7**(2): e156-e68.
38. Niederkrotenthaler T, Tran US, Gould M, et al. Association of Logic's hip hop song "1-800-273-8255" with Lifeline calls and suicides in the United States: Interrupted time series analysis. *British Medical Journal* 2021; **375**: e067726.
39. Marchant A, Hawton K, Stewart A, et al. A systematic review of the relationship between internet use, self-harm and suicidal behaviour in young people: The good, the bad and the unknown. *PLoS One* 2017; **12**(8).

40. Susi K, Glover-Ford F, Stewart A, Knowles Bevis R, Hawton K. Viewing self-harm images on the internet and social media platforms: Systematic review of the impact and associated psychological mechanisms. *Journal of Child Psychology and Psychiatry* 2023; **64**(8): 1115-39.
41. La Sala L, Pirkis J, Cooper C, et al. Acceptability and potential impact of the #chatsafe suicide postvention response among young people who have been exposed to suicide: Pilot study. *JMIR Human Factors* 2023; **10**.
42. La Sala L, Teh Z, Lamblin M, et al. Can a social media intervention improve online communication about suicide? A feasibility study examining the acceptability and potential impact of the #chatsafe campaign. *PLoS One* 2021; **16**(6).
43. Dobias M, Morris R, Schleider J. Single-session interventions embedded within Tumblr: Acceptability, feasibility, and utility study. *JMIR Formative Research* 2022; **6**(7): e39004.
44. Morrissey J, Kennedy L, Grace L. The opportunities and challenges of regulating the Internet for self-harm and suicide prevention. *Crisis* 2022; **43**(2): 77-82.
45. Hawton K, Hill N, Gould M, John A, Lascelles K, Robinson J. Clustering of suicides in children and adolescents. *Lancet Child and Adolescent Health* 2020; **4**(1): 58-67.
46. Hill N, Robinson J. Responding to suicide clusters in the community: What do existing suicide cluster response frameworks recommend and how are they implemented? *International Journal of Environmental Research and Public Health* 2022; **19**(8).
47. Public Health England. Identifying and Responding to Suicide Clusters: A Practice Resource. London: Public Health England, 2019.
48. Wasserman D, Hoven C, Wasserman C, et al. School-based suicide prevention programmes: The SEYLE cluster-randomised, controlled trial. *Lancet* 2015; **385**(9977): 1536-44.
49. Schilling E, Aseltine R, James A. The SOS Suicide Prevention Program: Further evidence of efficacy and effectiveness. *Prevention Science* 2016; **17**(2): 157-66.
50. Hill N, Robinson J, Pirkis J, et al. Association of suicidal behavior with exposure to suicide and suicide attempt: A systematic review and multilevel meta-analysis. *PLoS Medicine* 2020; **17**(3).
51. Pitman A, McDonald K, Logeswaran Y, Lewis G, Cerel J, Erlangsen A. Proportion of suicides in Denmark attributable to bereavement by the suicide of a first-degree relative or partner: Nested case-control study. *Acta Psychiatrica Scandinavica* 2022; **146**(6): 529-39.
52. Public Health England. Help is at Hand: Support After Someone May Have Died By Suicide London: Public Health England, 2021.
53. Andriessen K, Krysinska K, Hill N, 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**.

54. Arsenault-Lapierre G, Kim C, Turecki G. Psychiatric diagnoses in 3275 suicides: A meta-analysis. *BMC Psychiatry* 2004; **4**: 37.
55. The National Confidential Inquiry into Suicide and Safety in Mental Health. Annual Report: England, Northern Ireland, Scotland and Wales - 2021. Manchester: University of Manchester, 2021.
56. Large M. The role of prediction in suicide prevention. *Dialogues in clinical neuroscience* 2018; **20**(3): 197-205.
57. National Institute for Health and Care Excellence. Self-harm: Assessment, Management and Preventing Recurrence (NG 225). London: National Institute for Health and Care Excellence, 2022.
58. Turner K, Pisani A, Sveticic J, et al. The paradox of suicide prevention. *International Journal of Environmental Research and Public Health* 2022; **19**(22).
59. Hawton K, Lascelles K, Pitman A, Gilbert S, Silverman M. Assessment of suicide risk in mental health practice: Shifting from prediction to therapeutic assessment, formulation, and risk management. *Lancet Psychiatry* 2022; **9**(11): 922-8.
60. Stanley B, Brown G. Safety planning intervention: A brief intervention to mitigate suicide risk. *Cognitive and Behavioral Practice* 2012; **19**(2): 256-64.
61. Ferguson M, Rhodes K, Loughhead M, McIntyre H, Procter N. The effectiveness of the safety planning intervention for adults experiencing suicide-related distress: A systematic review. *Archives of Suicide Research* 2022; **26**(3): 1022-45.
62. Nuij C, van Ballegooijen W, de Beurs D, et al. Safety planning-type interventions for suicide prevention: Meta-analysis. *British Journal of Psychiatry* 2021; **219**(2): 419-26.
63. Stanley B, Brown G, Brenner L, et al. Comparison of the safety planning intervention with follow-up vs usual care of suicidal patients treated in the emergency department. *JAMA psychiatry* 2018; **75**(9): 894-900.
64. Geulayov G, Casey D, McDonald K, 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**(2): 167-74.
65. Hawton K, Bale L, Brand F, et al. Mortality in children and adolescents following presentation to hospital after non-fatal self-harm in the Multicentre Study of Self-harm: A prospective observational cohort study. *Lancet Child and Adolescent Health* 2020; **4**(2): 111-20.
66. Witt K, Hetrick S, Rajaram G, et al. Psychosocial interventions for self-harm in adults. *Cochrane Database of Systematic Reviews* 2021; **4**(4): Cd013668.

67. Witt K, Hetrick S, Rajaram G, et al. Interventions for self-harm in children and adolescents. *Cochrane Database of Systematic Reviews* 2021; **3**(3): Cd013667.
68. Cassidy S, Robertson A, Townsend E, O'Connor R, Rodgers J. Advancing our understanding of self-harm, suicidal thoughts and behaviours in autism. *Journal of autism and developmental disorders* 2020; **50**(10): 3445-9.
69. Balazs J, Kereszteny A. Attention-deficit/hyperactivity disorder and suicide: A systematic review. *World journal of psychiatry* 2017; **7**(1): 44-59.
70. Chen Q, Sjölander A, Runeson B, D'Onofrio B, Lichtenstein P, Larsson H. Drug treatment for attention-deficit/hyperactivity disorder and suicidal behaviour: Register based study. *British Medical Journal* 2014; **348**: g3769.
71. Abbar M, Demattei C, El-Hage W, et al. Ketamine for the acute treatment of severe suicidal ideation: Double blind, randomised placebo controlled trial. *British Medical Journal* 2022; **376**: e067194.
72. Hochschild A, Grunebaum M, Mann J. The rapid anti-suicidal ideation effect of ketamine: A systematic review. *Preventive Medicine* 2021; **152**(Pt 1): 106524.
73. Can A, Hermens D, Dutton M, et al. Low dose oral ketamine treatment in chronic suicidality: An open-label pilot study. *Translational psychiatry* 2021; **11**(1): 101.
74. Cipriani A, Hawton K, Stockton S, Geddes J. Lithium in the prevention of suicide in mood disorders: Updated systematic review and meta-analysis. *British Medical Journal* 2013; **346**: f3646.
75. 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. *American Journal of Psychiatry* 2017; **174**(8): 795-802.
76. Fitzgerald C, Christensen R, Simons J, et al. Effectiveness of medical treatment for bipolar disorder regarding suicide, self-harm and psychiatric hospital admission: Between- and within-individual study on Danish national data. *British Journal of Psychiatry* 2022: 1-9.
77. Lin Y, Mojtabai R, Goes F, Zandi P. Trends in prescriptions of lithium and other medications for patients with bipolar disorder in office-based practices in the United States: 1996-2015. *Journal of Affective Disorders* 2020; **276**: 883-9.
78. Pérez de Mendiola X, Hidalgo-Mazzei D, Vieta E, González-Pinto A. Overview of lithium's use: A nationwide survey. *International Journal of Bipolar Disorder* 2021; **9**(1): 10.
79. Kellner C, Greenberg R, Murrough J, Bryson E, Briggs M, Pasculli R. ECT in treatment-resistant depression. *American Journal of Psychiatry* 2012; **169**: 1238-44.

80. Kaster T, Blumberger D, Gomes T, Sutradhar R, Wijeysundera D, Vigod S. Risk of suicide death following electroconvulsive therapy treatment for depression: A propensity score-weighted, retrospective cohort study in Canada. *Lancet Psychiatry* 2022; **9**(6): 435-46.
81. Hawton K, Pirkis J. Suicide is a complex problem that requires a range of prevention initiatives and methods of evaluation. *British Journal of Psychiatry* 2017; **210**(6): 381-3.
82. Hawton K, Bergen H, Simkin S, Wells C, Kapur N, Gunnell D. Six-year follow-up of impact of co-proxamol withdrawal in England and Wales on prescribing and deaths: Time-series study. *PLoS Medicine* 2012; **9**(5): e1001213.
83. Hawton K, Bergen H, Simkin S, et al. Long term effect of reduced pack sizes of paracetamol on poisoning deaths and liver transplant activity in England and Wales: Interrupted time series analyses. *British Medical Journal* 2013; **346**: f403.
84. Kreitman N. The coal gas story. United Kingdom suicide rates, 1960-71. *British Journal of Preventive and Social Medicine* 1976; **30**(2): 86-93.
85. Clapperton A, Dwyer J, Spittal M, Roberts L, Pirkis J. Preventing railway suicides through level crossing removal: A multiple-arm pre-post study design in Victoria, Australia. *Social Psychiatry and Psychiatric Epidemiology* 2022; **57**(11): 2261-6.
86. Edwards A, Ohlsson H, Sundquist J, Sundquist K, Kendler K. Alcohol use disorder and risk of suicide in a Swedish population-based cohort. *American Journal of Psychiatry* 2020; **177**(7): 627-34.
87. Wyper G, Mackay D, Fraser C, et al. Evaluating the impact of alcohol minimum unit pricing on deaths and hospitalisations in Scotland: A controlled interrupted time series study. *Lancet* 2023; **401**(10385): 1361-70.
88. McManus S, Walby S, Barbosa EC, et al. Intimate partner violence, suicidality, and self-harm: a probability sample survey of the general population in England. *The Lancet Psychiatry* 2022.
89. Bandara P, Page A, Senarathna L, et al. Domestic violence and self-poisoning in Sri Lanka. *Psychological Medicine* 2020: 1-9.
90. Andreeva M, Audette-Chapdelaine S, Brodeur M. Gambling-related completed suicides: A scoping review. *Addiction Research and Theory* 2022; **30**(6): 391-402.
91. McClelland H, Evans J, Nowland R, Ferguson E, O'Connor R. Loneliness as a predictor of suicidal ideation and behaviour: A systematic review and meta-analysis of prospective studies. *Journal of Affective Disorders* 2020; **274**: 880-96.
92. Motillon-Toudic C, Walter M, Séguin M, Carrier J, Berrouiguet S, Lemey C. Social isolation and suicide risk: Literature review and perspectives. *European Psychiatry* 2022; **65**(1): e65.

93. Centers for Disease Control and Prevention. Suicide and Self-Harm Injury. 2023. https://www.cdc.gov/nchs/fastats/suicide.htm. (accessed 24/03/2024).
94. Rockett IRH, Caine ED, Banerjee A, et al. Fatal self-injury in the United States, 1999-2018: Unmasking a national mental health crisis. *EClinicalMedicine* 2021; **32**: 100741.
95. Sinyor M, Fraser L, Reidenberg D, Yip PSF, Niederkrotenthaler T. The Kenneth Law media event: A dangerous natural experiment. *Crisis* In press.
96. Kim SYH, Conwell Y, Caine ED. Suicide and physician-assisted death for persons with psychiatric disorders: How much overlap? *JAMA psychiatry* 2018; **75**(11): 1099-100.

Table 1 Topics covered in relation to (a) public health measures and (b) clinical developments

(a) Specific public health suicide prevention initiatives

Restriction of access to methods used for suicide

Prevention of suicide in public places

News reporting of suicides

Positive messaging about coping with adversity

Social media influences on suicidal behaviour

Suicide clusters

Prevention programmes in educational settings

Help for people bereaved by suicide

(b) Clinical developments

Therapeutic risk management and safety planning

Interventions for people who have self-harmed

Neurodevelopmental disorders

Specific treatments for people who may be at risk of suicide: ketamine, lithium, ECT

Table 2 Challenges to suicide prevention

Inequalities between suicide prevention activities in higher and lower income countries
Evaluation of suicide prevention activities, including rarity of outcome, difficulty of conducting controlled studies, influence of other major factors
Inadequate attention to public health measures
Neglect of key influences on suicide, e.g., alcohol misuse, domestic violence and abuse, gambling, loneliness
Lack of action on firearm suicides
Emergence of novel suicide methods
Impact of climate change and mass migration