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Title: Suicide risk and prevention during the COVID-19 pandemic: one year on

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Abstract

Emerging data from high and upper middle income countries indicate that suicide rates generally did not increase during the initial months of the COVID-19 pandemic, yet the pandemic's impact on suicide is complex. We discuss the nuances of this relationship, how it may evolve over time, and describe the specific steps that governments and societies must take to mitigate harm and prevent suicides in the late stages and aftermath of the pandemic.

Keywords: COVID-19; Epidemiology; International COVID-19 Suicide Prevention Research Collaboration

The COVID-19 pandemic is among the most disruptive events to global health in living memory. Evidence has emerged of substantial negative mental health consequences, including possible increasing rates of suicidal thoughts (O'Connor et al., 2021; Winkler et al, 2020). Nationwide survey data from the first months of the pandemic in the United States showed increased mental distress, anxiety, depression, substance use, and suicidal thoughts in adults (Czeisler et al., 2020; Twenge & Joiner, 2020). However, our group's recent study of suicide mortality in 21 high- and upper-middle income countries during the pandemic's first four months found no evidence of increased rates of suicide (Pirkis et al., 2021). Indeed, there was evidence of decreases in national or regional suicide rates in nine countries (Australia, Canada, Chile, Ecuador, Germany, Japan, New Zealand, South Korea, United States) and no significant change in rates in the remaining 12 countries (Austria, Brazil, Croatia, England, Estonia, Italy, Mexico, Netherlands, Peru, Poland, Russia, and Spain) (Pirkis et al., 2021). Recently published data from China and India support these findings (Zheng et al., 2021; Behera et al., 2021). Moreover, rates of outpatient and hospital presentations for self-harm have decreased in many regions during the early phase of the pandemic, suggesting a lower prevalence of medically serious suicidal behavior; though this might partly reflect the generally reduced use of healthcare services (Jollant et al., 2021; Carr et al., 2021; Knipe et al., in press). However, these findings should be viewed cautiously as they only pertain to the earliest months of the pandemic; it is unclear whether the observed trends will persist. Notably, a sensitivity analysis which incorporated up to seven months of data from 18 of the countries identified increased suicide rates for three locations (Vienna (Austria), Puerto Rico, and Japan) (Pirkis et al., 2021).

How should we interpret these seemingly contradictory findings and what are their implications for suicide prevention going forward? The pandemic's effects on mental health are

complex, simultaneously affecting both risk and protective factors for suicidal behaviour (Figure 1). On one hand, the pandemic has caused immense hardship arising from the effects of the disease itself, societal fear and uncertainty, prolonged isolation and physical distancing, disruption to education and school closure, economic hardship, increases in intimate partner/domestic violence, and bereavement. On the other hand, the collective trauma may also have normalised the experience of distress and resulted in a "coming together" phenomenon, as many individuals spend more time with their families and in their local communities. The pandemic has focused the public on survival and the collective hope that modern science will rescue the world with a vaccine. Hope, purpose, and belongingness may all lower the risk of suicide. These nuances may explain the counterintuitive increase in both suicidal thoughts and positive well-being reported in the UK (O'Connor et al., 2021). Furthermore, emerging evidence indicates that the pandemic may disproportionately affect young people including US data showing an increase in emergency presentations for suspected suicide attempts in adolescent girls (O'Connor et al., 2021, Yard et al., 2021); while young people have higher rates of suicide attempts, in high income countries they generally have substantially lower rates of suicide death. Such findings might explain rising rates of mental health symptoms and suicidal thoughts without corresponding increases in suicide. It should also be noted that deteriorating mental health has not been observed in all countries. For example, the prevalence of mental disorders and suicidal ideation were unchanged in Norway during the first six months of the pandemic (Knudsen et al., 2021).

Data from early phases of the pandemic demonstrate that hardship faced by people worldwide does not inevitably translate into increased suicide deaths, at least in higher income countries where short-term financial safety nets were put in place often in addition to preexisting

national suicide prevention strategies. That is important news which deserves broad attention. But lessons from previous pandemics suggest that we must avoid complacency (Zortea et al., in press). Mental health effects of the pandemic may increase over time due to prolonged economic stress and underemployment (Kawohl & Nordt, 2020) or post-infection increases in the prevalence of some psychiatric illnesses (Taquet et al., 2020). For example, in Japan, decreased suicide rates in the first four months of the pandemic were followed by a period with suicide rates that were higher than historical averages (Ueda et al., 2021). Moreover, in some locations where overall suicide rates were unchanged (or decreasing), there is concern about increased rates among youth, women and ethnic minorities (Ueda et al., 2021; Mitchell & Li, 2021). There is a clear need for continued monitoring of mental disorders and suicidal behaviour during the remainder of the pandemic and the protracted recovery period. This monitoring is especially necessary for low and middle income countries, given the dearth of existing data. It is also crucial given vaccine shortages that may prolong the pandemic and its impacts in these countries.

Proactive efforts to prevent suicide are, therefore, a current worldwide imperative. Robust, ongoing governmental and societal responses must include: 1) efforts to prevent and mitigate the negative effects of mass unemployment and economic hardship such as expanded unemployment and related social welfare programs; 2) actions to minimise the long-term damage to the career prospects of young people arising from disruptions to their education and to their transition to employment at a time of labour market upheaval, 3) timely access to high quality, evidence-based mental health treatment and suicide prevention interventions, including crisis helplines and services, with attention to the issue of diminished help-seeking during the pandemic; 4) public health and media messaging emphasizing healthy coping, emotional resilience and avoiding presentations of suicide as a common or rational strategy for managing

distress or an inevitable consequence of the pandemic; and 5) efforts to promote social cohesion with particular attention to places and times where societal divisions and/or discord may be emerging. A priority for the research community is also to evaluate which approaches have most effectively mitigated the pandemic's impact on suicide rates to inform future responses to similar events.

Unlike previous pandemics, COVID-19 is occurring in the modern digital world, where video conferencing and virtual healthcare provision are increasingly available. Public health advice based on real-time data and rapid development of vaccines have been demonstrated, while internationally coordinated economic mitigation strategies are now possible. These conditions may shorten the duration of the pandemic and prevent a substantial number of COVID-19 deaths in many countries. Preventing suicide during the remainder of the pandemic and its aftermath will likewise require robust, comprehensive efforts that address the diverse and rapidly changing conditions affecting risk in populations across the globe.

All of these efforts must include specific steps to address suicide risk in youth, migrants, those with preexisting health and/or socioeconomic challenges, as well as people who have been infected with COVID-19 and professionals experiencing long-term stress (e.g. healthcare workers), since these groups may be particularly vulnerable (Iob et al., 2020). Lastly, and perhaps most importantly, the economic and mental health consequences of this pandemic will last well beyond its duration. We therefore urge governments and other stakeholders to begin planning immediately, if they have not already done so, for how the strategies above will be maintained in the aftermath of the pandemic and what culturally-appropriate steps can be taken to facilitate healing and to promote community togetherness.

References

Behera C., Gupta S.K., Singh S., Balhara Y.P.S. (2021). Trends in deaths attributable to suicide during COVID-19 pandemic and its association with alcohol use and mental disorders: Findings from autopsies conducted in two districts of India. Asian Journal of Psychiatry 58:102597.

Carr M. J., Steeg S., Webb R. T., Kapur N., Chew-Graham C., Abel K., et al. (2021). Effects of the COVID-19 pandemic on primary care-recorded mental illness and self-harm episodes in the UK: a population-based cohort study. Lancet Public Health, 6, 2, E124-E135. doi: 10.1016/S2468-2667(20)30288-7

Czeisler M.É., Lane R.I., Petrosky E., Wiley J.F., Christensen A., Njai R., et al. (2020). Mental Health, Substance Use, and Suicidal Ideation During the COVID-19 Pandemic - United States, June 24-30, 2020. MMWR Morbidity and Mortality Weekly Report, 69, 32, 1049-1057.

Iob E., Steptoe A., & Fancourt D. (2020). Abuse, self-harm and suicidal ideation in the UK during the COVID-19 pandemic. Br J Psychiatry, 217, 4, 543-546.

Jollant F., Roussot A., Corruble E., Chauvet-Gelinier J., Falissard B., Mikaeloff Y., et al. (2021). Hospitalization for self-harm during the early months of the Covid-19 pandemic in France: a nationwide study. The Lancet Regional Health – Europe, 6,
100102. https://doi.org/10.1016/j.lanepe.2021.100102.

Kawohl W., & Nordt C. (2020). COVID-19, unemployment, and suicide. Lancet Psychiatry, 7, 5, 389-390.

Knipe D., Silva T., Aroos A., Senarathna L., Hettiarachchi N.M, Galappaththi S.R., et al. (in press). Hospital presenting self-poisoning during COVID-19 in Sri Lanka: an interrupted

time series analysis. Lancet Psychiatry.Knudsen A.K.S., Stene-Larsen K., Gustavson K., Hotopf M., Kessler R.C., Krokstad S., et al. (2021). Prevalence of mental disorders, suicidal ideation and suicides in the general population before and during the COVID-19 pandemic in Norway: A population-based repeated cross-sectional analysis. The Lancet Regional Health – Europe, 4, 100071, doi: https://doi.org/10.1016/j.lanepe.2021.100071.

Mitchell T. O., & Li L. (2021). State-Level Data on Suicide Mortality During COVID-19 Quarantine: Early Evidence of a Disproportionate Impact on Racial Minorities. Psychiatry Res, 295, 113629.

O'Connor R. C., Wetherall K., Cleare S., McClelland H., Melson A.J. , Niedzwiedz C. L., et al. (2021). Mental health and well-being during the COVID-19 pandemic: longitudinal analyses of adults in the UK COVID-19 Mental Health & Wellbeing study. British Journal of Psychiatry, 218, 6 , 326 - 333.

Pirkis J., John A., Shin S., DelPozo Banos M., Arya V., Aguilar P. A., et al. (2021). Suicide trends in the early months of the COVID-19 pandemic: Interrupted time series analysis of data from 21 countries. Lancet Psychiatry, [online ahead of print] S2215-0366(21)00091-2. doi: 10.1016/S2215-0366(21)00091-2.

Taquet M., Luciano S., Geddes J. R., & Harrison P. J. (2020). Bidirectional associations between COVID-19 and psychiatric disorder: retrospective cohort studies of 62 354 COVID-19 cases in the USA. Lancet Psychiatry, 8, 2, 130-140.

Twenge J.M., & Joiner T.E. (2020). Mental distress among U.S. adults during the COVID-19 pandemic. Journal of Clinical Psychology, 76, 12, 2170-2182.

Ueda M., Nordström R., & Matsubayashi T. (2021) Suicide and mental health during the COVID-19 pandemic in Japan. Journal of Public Health, fdab113, https://doi.org/10.1093/pubmed/fdab113. doi:10.1101/2020.10.06.20207530

Winkler P., Formanek T., Mlada K., Kagstrom A., Mohrova Z., Mohr P., et al. (2020). Increase in prevalence of current mental disorders in the context of COVID-19: analysis of repeated nationwide cross-sectional surveys. Epidemiology and Psychiatric Sciences. 29:e173.

Yard E., Radhakrishnan L., Ballesteros M.F., Sheppard M, Gates A, Stein Z., et al. (2021). Emergency Department Visits for Suspected Suicide Attempts Among Persons Aged 12–25 Years Before and During the COVID-19 Pandemic — United States, January 2019–May 2021. Morbidity and Mortality Weekly Report. ePub: 11 June 2021. doi: http://dx.doi.org/10.15585/mmwr.mm7024e1external icon.

Zheng X.Y., Tang S.L., Ma S.L., Guan W.J., Xu X., Xu H., et al. (2021). Trends of injury mortality during the COVID-19 period in Guangdong, China: a population-based retrospective analysis. BMJ Open, 11, 6, e045317.

Zortea T. C., Brenna C. T. A., Joyce M., McClelland H., Tippett M., Tran M. M., et al. (in press) The Impact of Infectious Disease-Related Public Health Emergencies on Suicide, Suicidal Behavior, and Suicidal Thoughts. Crisis, doi: 10.1027/0227-5910/a000753 2020 Oct 21:1-8. [ahead of print]

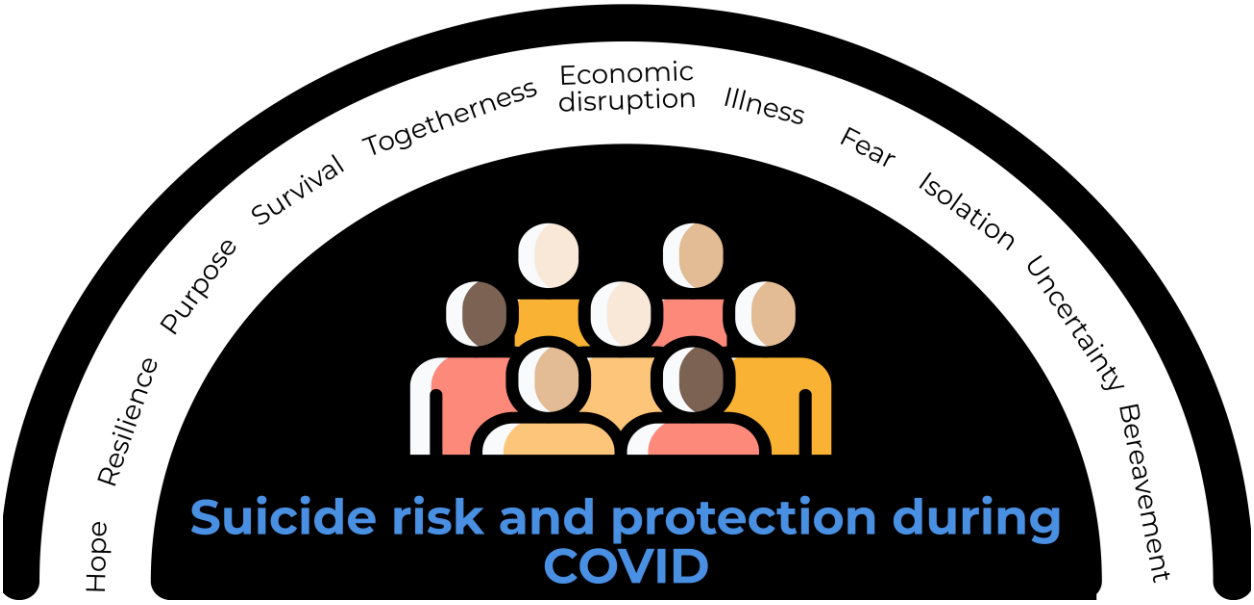

Figure 1: Potential Risk and Protective Factors that may Influence Suicide Rates during the COVID-19 Pandemic