

The occurrence of anxiety and/or depression was significantly associated with time spent on COVID-19 related news per day (odds ratio, OR=1.61, 95% CI: 1.42-1.84,  $p<0.001$ ). The prevalence of depression and/or anxiety was 17.8% among those spending less than 5 min per day on COVID-19 related news, and 27.9% among those who spent more than one hour.

Three psychosocial stressors were significantly associated with the development of both anxiety and depression: "I worry about myself and my loved ones being infected by COVID-19" (OR=1.95, 95% CI: 1.54-2.49 for anxiety; OR=1.24, 95% CI: 1.04-1.50 for depression), "I worry about my income, job, study or ability to pay the loan being affected" (OR=1.38, 95% CI: 1.13-1.68 for anxiety; OR=1.58, 95% CI: 1.35-1.86 for depression), and "Home quarantine causes great inconvenience to my daily life" (OR=1.31, 95% CI: 1.04-1.64 for anxiety; OR=1.42, 95% CI: 1.18-1.70 for depression).

In summary, our study revealed that the COVID-19 epidemic caused a sharp increase in the prevalence of anxiety and depression among the general adult population in China, compared to the prevalence of 4% in 2019<sup>4</sup>. The amount of time spent on news related to COVID-19 was significantly associated with the occurrence of these mental health problems, which is likely explained by excessive media coverage<sup>5</sup>.

The financial burden caused by massive quarantine was one

of the primary stressors related to both anxiety and depression. Besides psychological interventions, financial aid such as wage subsidy, tax exemption, and extended loan repayment may help reduce the anxiety and depression in the general population.

Our study was conducted around the peak of the COVID-19 epidemic<sup>6</sup>. A longitudinal follow-up would be helpful to track the changes in anxiety and depression levels at different stages of the epidemic.

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## Preventing suicide in the context of the COVID-19 pandemic

The impact of the COVID-19 pandemic on the labour market, as well as the government's response to mitigate risk via social isolation and quarantine, has resulted in the greatest and most rapid change in the employment sector ever recorded in the US. Notwithstanding emergency government financial response, it is anticipated that a significant percentage of the labour market will contract<sup>1</sup>. Moreover, the predicted increase in unemployment is expected to approximate, and perhaps exceed, that reported during the Great Depression lasting from 1929 to 1939 (i.e., 24.9%)<sup>2</sup>. The foregoing rapid rise in unemployment and associated economic insecurity is likely to significantly increase the risk for suicide.

In fact, during the most recent economic recession, a 1% rise in unemployment was associated with a rise in the suicide rate of 0.99% in the US (95% CI: 0.60-1.38,  $p<0.0001$ )<sup>3</sup>. Similarly, each percentage point increase in unemployment was accompanied by a 0.79% rise in suicide (95% CI: 0.16-1.42,  $p=0.016$ ) in individuals 65 years of age or younger in Europe (e.g., Spain, Greece)<sup>4</sup>. During the 1997-1998 Asian economic recession, unemployment was a critical determinant mediating the increase in suicides in Japan, Hong Kong, and South Korea<sup>5</sup>.

We used time-trend regression models to assess and forecast excess suicides attributable to the economic downturn following the COVID-19 pandemic. Suicide mortality was estimated for three possible scenarios: a) no significant change in unemployment rate (i.e., 3.6% for 2020, 3.7% for 2021); b) moderate in-

crease in projected unemployment rate (i.e., 5.8% for 2020, 9.3% for 2021), mirroring unemployment rates in 2008-2009; and c) extreme increase in projected unemployment rate (i.e., 24% for 2020, 18% for 2021).

The annual suicide mortality rate accelerated in the US by 1.85% (95% CI: 1.70-2.00,  $p<0.0001$ ) between 1999 and 2018. We found that a percentage point increase in unemployment was associated with an increase in suicide rates of 1.00% (95% CI: 1.02-1.06,  $p<0.0001$ ) between 1999 and 2018. The suicide rate was 14.8 per 100,000 in 2018 (N=48,432).

In the first above-mentioned scenario (i.e., unemployment rate remains relatively consistent), the predicted suicide rates per 100,000 are 15.7 (95% CI: 15.3-16.1) in 2020 and 16.2 (95% CI: 15.7-16.8) in 2021. The foregoing suicide rates would result in 51,657 suicides in 2020 and 53,480 in 2021 (assuming 2019 population size of 329,158,518). In the second scenario (i.e., moderate increase in projected unemployment rate), suicide rates per 100,000 will increase to 16.9 in 2020 (95% CI: 16.4-17.5; N=52,728) and 17.5 in 2021 (95% CI: 16.8-18.2; N=55,644). This second scenario would result in a total of 3,235 excess suicides over the 2020-2021 period, representing a 3.3% increase in suicides per year (when compared to the 2018 rate of 48,432). In the third scenario (i.e., extreme increase in projected unemployment rate), suicide rates per 100,000 are projected to increase to 17.0 in 2020 (95% CI: 16.6-17.5; N=56,052) and 17.4 in 2021 (95% CI: 16.8-18.0; N=57,249). This rise in suicide rate would result in 8,164 excess

suicides over the two-year period, representing an 8.4% increase in suicides (when compared to the 2018 rate of 48,432).

What is especially concerning about our projections is the genuine uncertainty with respect to the labour market post-COVID-19, as well as the tremendous financial uncertainty and decrease in consumer sentiment, all of which are independent and additional contributors to suicide<sup>6</sup>. Moreover, social isolation and quarantine, which are critical viral transmission risk mitigation strategies, are recommended nation-wide. Social isolation is well established as a significant risk factor for suicidality<sup>7</sup>.

Multiple studies have reported that government policy response can significantly mitigate the increased risk of suicide due to economic hardship and unfavourable labour market dynamics. For example, in Japan, a 1% per capita increase in local government expenditures was associated with a 0.2% decrease in suicide in the years following the 2008 recession<sup>8</sup>. The Japanese experience was replicated in Europe, wherein government spending, especially on social programs intended to mitigate suicide risk, significantly reduced projected suicides in Denmark<sup>9</sup>.

Preventing suicide in the context of the COVID-19-related unemployment and financial insecurity is a critical public health priority. In addition to financial provisions (e.g., tax deferral, wage subsidy), investing in labour market programs that intend to retrain workers is warranted. Furthermore, government support for employers is critical to reduce the massive increase in unemployment and contraction of the labour market.

Proactive public-private partnerships that aim to provide psy-

chological first-aid and psychiatric emergency services to persons at imminent risk of suicide are essential. Individual resilience enhancement strategies should be implemented (e.g., exercise, sleep hygiene, structured daily schedule, better diet). Approximately half of suicides in the US are committed with a gun; recommendations surrounding appropriate gun and ammunition storage are warranted. For persons with clinically significant depressive/anxiety symptoms or persons experiencing features of post-traumatic stress disorder or drug/alcohol abuse, timely access to comprehensive treatment should be part of the COVID-19 management strategy.

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## Open access of psychological intervention manuals

Open science is a movement aimed at making research methodologies, protocols, tools, data, analyses and reports accessible as early as possible, to facilitate further research<sup>1</sup>. Open science of psychological treatments is an area that warrants special attention.

Psychological treatments for mental disorders are increasingly being investigated globally, with promising results<sup>2,3</sup>. This body of research has resulted in recommendations by the World Health Organization (WHO) on a range of psychological interventions, such as cognitive-behaviour and interpersonal psychotherapies, as first line treatment options for depression<sup>4</sup>. There is also substantial evidence that psychological interventions can be delivered effectively not only by specialist mental health providers, but also by general health staff and community workers, who are more easily available<sup>5</sup>. One would then expect that psychological treatment manuals underpinning these findings be readily accessible.

The psychological treatment manual is a key element of the research methodology, because it outlines the various aspects of the intervention, including the psychological techniques used, the number and duration of sessions, and the specific content details. The manual is usually carefully designed, revised after piloting, and possibly adapted to local context, before being used

in randomized controlled trials (RCTs).

Papers on RCTs typically include a paragraph describing the treatment provided. However, such a brief description – in the absence of a manual – is insufficient for readers to implement the intervention or replicate the study. Also, the limited details often make it difficult to accurately understand the intervention and interpret the results of the study, which becomes a major challenge when conducting and interpreting meta-analyses of psychological interventions.

We reviewed a database of 27 trials investigating psychological treatments for common mental disorders delivered by non-specialist providers in low and middle income countries (LMICs)<sup>3</sup>, in order to explore how many treatment manuals used in the studies were cited and how many were open access.

We defined a psychological treatment manual as a structured form of guidance (written material and instructions to be followed). Manuals were coded as being either generic (i.e., the manual was developed for a non-specific context and had to be adapted before use) or exact (i.e., the manual is exactly the one used). From an open science perspective, the exact manual needs to be accessible.

We operationalized open access of a psychological treatment manual as one of the following: a) the weblink to the exact man-