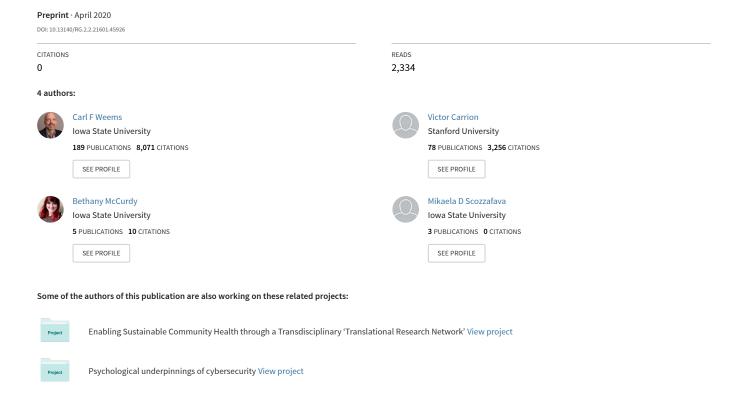# Increased Risk of Suicide Due to Economic and Social Impacts of Social Distancing Measures to Address the Covid-19 Pandemic: A Forecast

4 authors:

Carl F Weems
Iowa State University
189 PUBLICATIONS   **8,071** CITATIONS

SEE PROFILE

Bethany McCurdy
Iowa State University
5 PUBLICATIONS   **10** CITATIONS

SEE PROFILE

Victor Carrion
Stanford University
78 PUBLICATIONS   **3,256** CITATIONS

SEE PROFILE

Mikaela D Scozzafava
Iowa State University
3 PUBLICATIONS   **0** CITATIONS

SEE PROFILE

Some of the authors of this publication are also working on these related projects:

Project   Enabling Sustainable Community Health through a Transdisciplinary 'Translational Research Network' View project

Project   Psychological underpinnings of cybersecurity View project

Increased Risk of Suicide Due to Economic and Social Impacts of Social Distancing Measures to Address the

Covid-19 Pandemic: A Forecast

Carl F. Weems PhD

Professor and Chair

Human Development and Family Studies

Co-Director, ISU Translational Research Network (UTuRN)

Iowa State University

Victor G. Carrion, MD

Professor and Vice Chair of Child and Adolescent Psychiatry, Department of Psychiatry and Behavioral Sciences,

School of Medicine, Stanford University

Bethany H. McCurdy, BS & Mikaela D. Scozzafava, MA

Research Associates, ISU Translational Research Network (UTuRN)

Human Development and Family Studies

Iowa State University

This paper in under peer review and has not yet been published and is not therefore the authoritative document of record. Draft version April/7/2020. This paper has not been peer reviewed. Please do not copy or cite without author's permission.

Correspondence To: Carl F. Weems, Professor and Chair, Department of Human and Family Studies, 4380 Palmer, Iowa State University, Ames, IA 50011. E-mail: cweems@iastate.edu

Abstract

Background. Due to the Covid-19 pandemic there have been unprecedented increases in unemployment and social isolation nationally and globally. Predicting suicide rates as a result of this pandemic can provide information about the potential mental health ramifications and supports that may be needed. This article aims to forecast the potential increased incidence of suicide due to the economic and social impacts of the social distancing measures in place to address the Covid-19 pandemic. ***Methods***. Authors identified available evidence to develop a statistical forecast using previous estimates of the impact of unemployment and social isolation on suicide rates as well as predicted unemployment data and social isolation data. ***Findings***. The increased rate of suicide worldwide due to increased unemployment and social isolation could be close to 50,000 individuals based on initial estimates of these collateral impacts. ***Interpretation***. Policy, funding, and interventions to address the mental health impact of the Covid-19 pandemic is needed. The model can be applied to predict additional localized or regional effects. The efforts to stop the spread of Covid-19 can be weighed against these potential collateral mental health effects. ***Funding.*** The authors received no financial support for the research, authorship, and/or publication of this manuscript.

Research in Context

Evidence before this study

Along with the health devastation of the coronavirus pandemic and Covid-19 related disease, it is apparent that there will be traumatic stress wrought by the human loss, severe stress, and global fear. The collateral economic and social impacts are also likely to have a deep effect on the mental health of many throughout the entire world. According to the World Health Organization, suicide accounts for approximately 800,000 deaths per year globally with 79% of suicides occurring in low- and middle-income countries. World suicide incidence is 10·6 persons dying from suicide per 100,000 people with an estimate of 7·7 for females and 13·5 for males. Being male, low socioeconomic status, and being from low-income countries have increased rates and increased risk. In the USA, rates were 22·4 for males and 6·1 per 100,000 for females as reported by the US Office of Disease Prevention and Health Promotion. Social isolation/loneliness and unemployment are well established factors associated with increased risk of suicide. Due to the Covid-19 pandemic there have been unprecedented increases in unemployment and social isolation nationally and globally. Predicting suicide rates as a result of this pandemic can provide information about the potential mental health ramifications and supports that may be needed.

Added value of this study

This article provides a forecast the potential increased incidence of suicide due to the economic and social impacts of the social distancing measures in place to address the Covid-19 pandemic. Authors identified available evidence to develop a statistical forecast using previous estimates of the impact of unemployment and social isolation on suicide rates as well as predicted unemployment data and social isolation data. The model can be applied to predict additional localized or regional effects. The efforts to stop the spread of Covid-19 can be weighed against these potential collateral mental health effects.

Implications of all the available evidence

The increased rate of suicide worldwide due to increased unemployment and social isolation could be close to 50,000 individuals based on initial estimates of these collateral impacts. Policy, funding, and interventions to address the mental health impact of the Covid-19 pandemic is needed.

Increased Risk of Suicide Due to Economic and Social Impacts of the Social Distancing Measures to Address the Covid-19 Pandemic: A Forecast

Along with the health devastation of the coronavirus pandemic and Covid-19 related disease, it is apparent that there will be traumatic stress wrought by the human loss, severe stress, and global fear. The collateral economic and social impacts are also likely to have a deep effect on the mental health of many throughout the entire world. The mental health impact of the disintegration of the typical social and economic world will have effects of which the full toll will not be fully understood for years via retrospective analysis of data to be collected. However, this paper examines the future potential of the negative psychosocial consequences on suicide rates. The study is prompted by the need to estimate the mental health needs in the coming months/years and recent calls to better understand the broader implications of the efforts to stem the spread of the virus. Brooks et al.[1] conducted a review of studies examining the effects of quarantine measures and identified several psychological impacts that include post-traumatic stress symptoms, confusion, and anger with longer quarantine duration, infection fears, frustration, boredom, inadequate supplies, inadequate information, financial loss, and stigma contributing to psychological stress. In addition, the Center for Disease Control (CDC)[2] warns about feelings of guilt that may be associated with not performing work or parenting duties. In this study, we examine the potential impact on USA and worldwide suicide rates using estimates from existing research and public data, focusing on two factors which have estimates of the initial impact of the pandemic and are also known to increase risk for suicide - social isolation/loneliness and unemployment.

The adverse conditions precipitated by the effects of the pandemic as well as the social distancing measures threaten positive self-evaluations among the entire population of the world in multiple ways, including the disruption of esteem-supporting relationships (e.g., with co-workers, teachers, friends, neighbors). After disaster, adverse conditions for positive self-evaluation exist and the context in which many individuals find themselves are thwarting the use of strategies to maintain positive self-evaluations[3,4]. This may be particularly true for disadvantaged communities and families, and in those whose identities rely on work or performance[5]. In terms of social relatedness, the social distancing measures are seriously disrupting social ties and one's ability to access not only his or her extended community, but with family members as well. Indeed, loneliness and related mental health impacts are a very common outcome of social distancing measures[1]. For example, Reynolds et al.[6] found that loneliness was reported in 38·5% (95% CI 35·5–41·5) and social isolation in 60·6% (95% CI 57·6 – 63·6) of a large sample (n=1,057) of individuals quarantined during the 2003 severe acute respiratory syndrome (SARS) outbreak in Canada.

In addition to social isolation, US jobless claims exceeded 3,200,000 on March 21, 2020 according to the US Department of Labor[7], which was over 3 million more newly unemployed for each of the two prior weeks as well as the same week one year ago. This number jumped to well over 6 million on April 2nd [7]. According to International Labour Organization[8] estimates the pandemic could result in 24·7 million jobs lost worldwide. Their analysis indicates that this may be a worst-case scenario for global unemployment with estimates of a "low" unemployment scenario of 5·3 million (already surpassed by the US alone) and "mid" scenario of 13 million jobs lost [8]. Supporting relationships at the family, neighborhood, church, school, and work have been interrupted - threatening the amount or the stability of contact with social ties, financial resources, and a sense of meaning [3,4,5]. Reasoning from these considerations on social isolation and employment loss, there is a need to examine the potential for these effects to impact the overall death rate via suicide. Using two well established factors associated with suicide, namely social isolation and unemployment, allows for a somewhat conservative estimate of one of the most severe mental health impacts.

According to the World Health Organization (WHO) [8], suicide accounts for approximately 800,000 deaths per year globally with 79% of suicides occurring in low- and middle-income countries in 2016. Suicide accounted for 1·4% of all deaths worldwide, making it the 18th leading cause of death in 2016. World suicide incidence is 10·6 persons dying from suicide per 100,000 people with an estimate of 7·7 for females and 13·5 for males[9]. Being male, low socioeconomic status, and being from low-income countries have increased rates and increased risk[8]. In the USA, rates were 22·4 for males and 6·1 per 100,000 for females as reported by the US Office of Disease Prevention and Health Promotion[10].

In terms of increased risk of suicide associated with unemployment, review of the literature and analysis by Gunnell and Chang[11] suggests a consistent association that has been well established for some time. In terms of risk

estimates, Kposowa[12] used a cohort analysis of social factors predicting suicide in the US National Longitudinal Mortality Study. The sample was 471,922 individuals 15 years and above at the beginning of the study, of whom 545 had committed suicide. Unemployed men were twice (2·12, 95% CI = 1·16–3·88) as likely to commit suicide as those employed with unemployed women 3.8 times more likely to kill themselves as their employed counterparts (3·85, CI 1·45–10·2).

It's also long been understood that social isolation increases risk of suicide[13]. A recent review by Calati[14] suggests that the objective condition (e.g., living alone) and the subjective feeling of being alone (i.e., loneliness) are strongly associated with suicidal outcomes with these associations found transculturally. In terms of estimates of increased risk, Stickley and Koyanagi[15] used the US National Longitudinal Mortality Study with data from 7403 persons. Attempted suicide was dichotomous: "Have you ever made an attempt to take your life, by taking an overdose of tablets or in some other way?". Loneliness was assessed by subjectively asking if they felt 'lonely and isolated from other people' in the past two weeks with 4 options: very much, sometimes, not often, and not at all. Odds ratio controlling for age, sex, educational qualifications, ethnicity, marital status, wealth, employment status, alcohol dependence, social support, physical health conditions, stressful life events, and common mental disorders for those in the very much loneliness category was 3·45.

In addition to unemployment and loneliness, the pandemic is expected to impact negative mental health outcomes in multiple ways, and these are also predictive of suicide. Common reactions to the stress of the disaster like pandemic are substance abuse, mood disorders, anxiety and post-traumatic stress. A meta-analysis of this literature by Yoshimasu[16] reports that substance-related disorders [OR = 5·24; 95% CI = 3·30–8·31] and mood disorders [OR = 13·42; 95% CI = 8·05–22·37] are associated with suicidal risk. Lin et al.[17] reported that depressed mood increased suicide risk by a factor of 2·11 (adjusted risk ratio).

Drawing from the theoretical considerations above and data on the increased risk for suicide engendered by mental health problems, unemployment, and social isolation, each of which are increasing in incidence as a result of the pandemic, this paper calculates the potential increases in death associated with the Covid-19 pandemic due to suicide.

Method

A literature search identified estimates for developing a statistical model to predict increased suicide rates.

Data from the WHO and US Office of Disease Prevention and Health Promotion were used to estimate existing suicide rates. World suicide incidence is 10·6 persons dying from suicide per 100,000 people with estimates being 7·7 (·000077) for females and 13·5 (.000135) for males[9]. In the USA, existing rates were estimated as 22·4 for males (·000224) and 6·1 (·000061) for females per 100,000[9].

Unemployment

Estimates for unemployment were taken from the US jobless claims which hit 3,283,000 on March 21, 2020 and over 6 million on April 2nd [7]; reported were over 3 million more unemployed. The US workforce is 47% female[7]. To provide a conservative estimate for those effected, we used the April 2nd number of 6 million additional[7] unemployed as the theoretical population impacted in the US. According to International Labour Organization[8] estimates, the pandemic could result in 24·7 million jobs lost, with a "low" unemployment scenario of 5·3 million and "mid" scenario of 13 million jobs lost. Given these numbers, a conservative estimate for those effected, the theoretical population impacted for women and men of 10 million individuals, was used with the gender distribution of 38·96% of the workforce being female[18]. Estimates for the increased risk of suicide for unemployment were taken from Kposowa[12] predicting suicide in the US National Longitudinal Mortality Study. For unemployed men, the risk ratio of 2·12 was used and for unemployed women, the risk ratio was 3·8.

Social Isolation

Estimates for the number affected by increased social isolation were taken from public reports of stay at home orders for the USA on March 25th, which was estimated to be 50% of the US population. As of March 25th, 15 states and 30 municipalities had ordered 166 million people to stay home, according to data compiled by Regan et al.[19] using US Census population estimates. For the world, the estimate of increased movement restriction was estimated

at 2·6 billion people. As noted, Reynolds et al.[6] estimated loneliness in 38·5% and social isolation 60·6% of those quarantined. As a conservative estimate of 10% of those effected by stay at home orders as of March 25th was used as a theoretical population of those impacted by loneliness in the US which would be 16·6 million of whom 50·8% are female, according to the US Census Bureau[20] as of 2019. For the world, we used an estimate of 5% or 130 million for the worldwide theoretical population of those effected by loneliness of whom there is a total population ratio of 1·01 males to every 1 female[21].

Estimates for suicide risk associated with social isolation and loneliness were estimated from two sources - the Stickley & Koyanagi[15] analysis of the US National Longitudinal Mortality with odds ratios for suicide attempts for those in the most severe loneliness category ranged from 3·45 (lifetime suicide attempt) to 17·37 (past 12-month suicide attempt), however these were not broken down by sex and the data for calculating relative risk was not available. Kposowa[12] predicting suicide in the US National Longitudinal Mortality Study also reported relative risk ratios for those living alone with estimates ranging from 1·4 to 1·55 for males and 1·93 to 2·4 for females. Taken together, our models used an estimate of 1·5 for males and 2·0 for females.

Mental Health

The statistical models added a negative mental health multiplier. Drawing from the broader literature and data in Lin et al.[17] reporting that depressed mood may increase suicide risk by a factor of 2·11, this number was used in the models as a mental health multiplier. This addresses the fact that our model cannot estimate those who both lost their job and became severely lonely and cannot estimate incidence of mental disorder impacts on the general population resulting from the pandemic.

Statistical model

The estimate was based on the following: The estimate of existing incidence establishes the baseline number of individuals that increased risk will exacerbate. The estimated increased risk is the multiplier that either unemployment or loneliness adds to the estimate of additional cases of suicide. The estimate of those affected is the theoretical population of those impacted by the risk factors of unemployment or loneliness. The mental health multiplier is added to the equation to acknowledge the additional risk added by the increased risk associated with mood disorders and substance abuse and is theoretically a conservative estimate for all the various mental health factors that may increase risk among the theoretical population of those affected by unemployment and loneliness, while recognizing error in the estimates of the population impacted. Thus the equation was: Estimate of existing incidence * Estimate of Increased Risk (Risk Ratio) * Estimated number of Those Effected * Mental health multiplier 2·11 = Number of Suicides. These analyses were stratified by sex differences in base rates, risk estimates and workforce and population estimates. Base rates (existing incidence times the theoretical number effected) are then subtracted from these totals to give an estimate of the increased rate. Data were calculated in MS Excel and the spreadsheet is available in the online supplement.

Results

Unemployment

Results of the estimates for unemployment are presented in Table 1 and these are broken down by gender. US suicide incidence stratified by gender, times the increased risk estimate by gender, times the mental health multiplier, times the theoretical number impacted and then subtracting out the base rate estimate suggest the USA may see over 3,800 additional suicides and that the world may see as more than 5,100 additional due to unemployment.

Loneliness

Results of the estimates for loneliness are also presented in Table 1and these are broken down by gender. US suicide incidence stratified by gender, times increased risk estimate, times the mental health multiplier, times the theoretical number impacted and then subtracting out the base rate estimate suggests the USA may see over 5,600 additional suicides and that the world may see as more than 35,000 additional suicides due to loneliness/isolation.

Discussion

The results of the estimations suggest that overall more than 49,000 additional suicides could be seen based on conservative estimates of those impacted by initial effects on employment and social isolation. The estimated numbers could be compounded by the expected limited work force and resources to address mental health. Governments may consider establishing funding sources throughout the forecast of the pandemic in order to procure needed operations of all systems providing mental health care. Brooks et al.[1] suggests that in situations where physical isolation/distancing is required – the goals might be to do so for no longer than required, provide a clear rationale for the efforts, and provide information ensuring sufficient supplies are available. They also suggest that appealing to a sense of altruism about the benefits of quarantine to the wider society may also help.

The dire warning of this data is one we hope will not come to fruition. This is one theoretical predictions the authors hope will not be worn out by future analysis. However, this paper provides a contribution by drawing attention to the future mental health needs and is a prompt for proactive measures. Important to note though not explored thoroughly here is the psychological effect of social stigma that may precipitate suicide in individuals with a viral infection. Theories of stigma suggest that stigmatization significantly influences its targets' mental health[22,23]. Previously, research has found associations between suicide and social stigma in patients diagnosed with HIV/AIDS[24] and Ebola[25]. Little is known about health effects of social stigmatization regarding viral infections and requires further exploration.

In terms of the archival contribution of this paper, our estimates of the number of individuals impacted, while based on the available data, are liable to wide variation if we revise them down words we could have as few as 5,000 additional suicide and revise them upwards we could easily see 100,000 more cases worldwide. This fact shows both the power of intervention to prevent the loss of life, and also points to the utility of the model developed for regional, state or other country wide efforts. That is, the model developed here is probably more accurate for the USA estimates. Yet, the model can be applied at regional, state, country levels where and when more specific data emerges. Analyzing the data by regional, state, or country planners may supply more localized estimates for mental health preparedness efforts. Similar models might be developed for predicting the increased incidence of substance abuse and mental disorders.

Identifying the results of previous quarantine efforts is also beneficial to understand what to anticipate after a pandemic. A positive impact can result from marketing campaigns highlighting the benefits of being responsive together through physical distancing while maintaining social and emotional connectedness. Hawryluck et al.[26] suggested that distress among those quarantined during the SARS epidemic in Toronto might have been lessened by thorough education, detailing and reinforcing the importance of quarantine, while also providing outreach to increase individuals' stress management. These efforts can be led by any organization, their government, or different communities. The media and health organizations provided the majority of information about disease control measures to quarantined individuals in Toronto[26]. Employers might also allow time for adaptation and grief of loss while providing supportive resources and innovative approaches that allow individuals the capability of continuing to contribute to their work-related mission and efforts.

In partnership with national leadership, health systems should probably attend not only to acute care, but take preventive measures, such as the implementation of loan forgiveness programs, reduce the cost of postgraduate training, shorten the duration of training, and other approaches that incentivize individuals to seek a career in mental health. This may take rethinking current disaster aid funding from a short term to longer term focus[27]. Building the work force, the employers and the health care of tomorrow requires utilizing this time as an opportunity to be free from traditional constraints and evolve into a society that is more adaptive to current and future needs. Above all, let us not avoid reality, let us approach it. The goal of this article is to face the problem head on and develop intervention measures that can ameliorate this pandemic's impact on health.

Author contributions:

CFW conceptualized the ideas for this article with help from VGC. CFW, BHM, and MDS conducted literature searches. CFW wrote the first draft of the manuscript. VGC, BHM, and MDS contributed to the writing after the first draft. BHM and MDS verified data, figures, and analysis from the first draft.

References

1 Brooks S, Webster R, Smith L, Woodland L, Wessely S, Greenberg N, et al. The psychological impact of quarantine and how to reduce it: rapid review of the evidence. Lancet, 2020; **395**: 912-20.

2 Centers for Disease Control and Prevention. WISQARS Leading Causes of Death Reports. 2020 [cited 2020 Apr 1]. Available from https://webappa.cdc.gov/sasweb/ncipc/leadcause.html

3 Scott B, Weems C. Natural disasters and existential concerns: A test of Tillich's theory of existential anxiety. J Humanist Psychol, 2013; **53**: 114-28.

4 Weems C, Watts S, Marsee M, Taylor L, Costa N, Cannon M, et al. The psychosocial impact of Hurricane Katrina: Contextual differences in psychological symptoms, social support, and discrimination. Behav Res Ther, 2007; **45**: 2295-2306.

5 Weems C, Overstreet S. Child and adolescent mental health research in the context of Hurricane Katrina: an ecological-needs-based perspective and introduction to the special section. J Clin Child Adolesc Psychol, 2008; **37**: 487-494.

6 Reynolds D, Garay J, Deamond S, Moran M, Gold W, Styra, R. Understanding, compliance and psychological impact of the SARS quarantine experience. Epidemiol Infect; 2008: **136**(7): 997-1007.

7 US Department of Labor. 2020 [cited 2020 April 2]. Available from https://www.dol.gov/ui/data.pdf?mod=article_inline.

8 International Labour Organization (ILO), 2020 [cited 2020 Mar 29]. Available from https://www.ilo.org/global/about-the-ilo/newsroom/news/WCMS_739961/lang--en/index.htm

9 WHO. 2020 [cited 2020 Mar 29]. Available from https://www.who.int/mental_health/prevention/suicide/estimates/en/

10 US Office of Disease Prevention and Health Promotion. 2020 [cited 2020 Mar 29]. Available from https://www.healthypeople.gov/2020/leading-health-indicators/2020-lhi-topics/Mental-Health/data#MHMD-1

11 Gunnell D, Chang S. Economic recession, unemployment, and suicide. In O'Connor RC, Pirkis J. The International Handbook of Suicide Prevention. 2nd ed. Hoboken: Wiley; 2016. p. 284-300.

12 Kposowa A. Unemployment and suicide: a cohort analysis of social factors predicting suicide in the US National Longitudinal Mortality Study. Psychol Med, 2001; **31**(1): 127-38.

13 Trout D. The role of social isolation in suicide. Suicide Life Threat Behav, 1980; **10**(1): 10-23.

14 Calati R, Ferrari C, Brittner M, Oasi O, Olié E, Carvalho A, et al. Suicidal thoughts and behaviors and social isolation: A narrative review of the literature. J Affect Disord, 2020; **245**: 653-67.

15 Stickley A, Koyanagi A. Loneliness, common mental disorders and suicidal behavior: Findings from a general population survey. J Affect Disord, 2016; **197:** 81-87.

16 Yoshimasu K, Kiyohara C, Miyashita K, Stress Research Group of the Japanese Society for Hygiene. Suicidal risk factors and completed suicide: meta-analyses based on psychological autopsy studies. Environ Health Prev Med, 2008; **13**(5): 243-56.

17 Lin S, Hung T, Liao Y, Lee W, Tsai S, Chen C, et al. Protective and risk factors for inpatient suicides: a nested case–control study. Psychiatry Res, 2014; **217**(1-2): 54-59.

18 World Bank. Labor force. 2020 [cited 2020 Apr 1]. Available from https://data.worldbank.org/indicator/sl.tlf.totl.fe.zs

19 Regan H, Berlinger J, Renton A, Kottasová I, Wagner, M. CNN. Updated 9:34 p.m. ET, March 25, 2020 https://edition.cnn.com/world/live-news/coronavirus-outbreak-03-25-20-intl-hnk/h_59c4bfec3a94f65d7d391ccf455ac455

20 US census Bureau. 2020 [cited 2020 Apr 1]. Available from
    https://www.census.gov/quickfacts/fact/table/US/LFE046218

21 CIA. World Fact Book. 2020 [cited 2020 Apr 1]. Available from https://www.cia.gov/library/publications/the-world-factbook/geos/xx.html

22 Herek GM. Confronting sexual stigma and prejudice: Theory and practice. Journal of social issues. 2007 Dec;**63**(4):905-25.

23 Meyer IH. Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations: conceptual issues and research evidence. Psychological bulletin. 2003 Sep;**129**(5):674.

24 Maj M. Psychiatric aspects of HIV-1 infection and AIDS. Psychological Medicine. 1990 Aug;**20**(3):547-63.

25 Hewlett BS, Amola RP. Cultural contexts of Ebola in northern Uganda. Emerging infectious diseases. 2003 Oct;**9**(10):1242.

26 Hawryluck L, Gold WL, Robinson S, Pogorski S, Galea S, Styra R. SARS control and psychological effects of quarantine. Emerg Infect Dis, 2004; **10**(7): 1206-12.

27 Weems CF. Hurricane Katrina and the need for changes in the federal funding of disaster mental health. American Journal of Disaster Medicine, 2010; **5:** 57-60.

Table 1 *Estimates of Increased Suicide Risk Due to Covid-19 Collateral Effects on Unemployment and Loneliness/Social Isolation*

	Estimate of Existing Incidence	Estimate Increased Risk (Risk Ratio)	Theoretical Number of Those Impacted	Mental Health Multiple	Suicide N	Subtotal	Minus Base rate	Increase Subtotals
Unemployment								
USA								
Males	0·000224	2·2	3,180,000	2.11	3,306·59		712·32	
Females	0·000061	3·85	2,820,000	2.11	1,397·40		172·02	
World						4,703.99		3,819·65
Males	0·000135	2·2	6,140,000	2·11	3,847·75		828·90	
Females	0·000077	3·85	3,860,000	2·11	2,414·47		297·22	
						6,262.22		5,136·10
Loneliness								
USA								
Males	0·000224	1·5	8,167,200	2·11	5,790·22		1,829·45	
Females	0·000061	2	8,432,800	2·11	2,170·77		514·40	
World						7,960.99		5,617·14
Males	0·000135	1·5	65,650,000	2·11	28,050·60		8,862·75	
Females	0·000077	2	64,350,000	2·11	20,909·89		4,954·95	
						48,960.49		35,142·79
								Total Increase
Total =					67,887·70		18,172·01	49,715·68