COVID-19 AND MENTAL HEALTH IN VULNERABLE POPULATIONS: A NARRATIVE REVIEW

DISCUSSION PAPER

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Abhery Das
Tim Bruckner
Shekhar Saxena
Ada Alqunaibet
Sami Almudarra
Christopher H. Herbst
Reem Alsukait
Sameh El-Saharty
Abdullah Algwaizini

WORLD BANK GROUP
Health, Nutrition & Population
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ACRONYMS AND ABBREVIATIONS

COVID-19    coronavirus disease 2019
EAPs    Employee Assistance Programs
ILO    International Labour Organization
KSA    Kingdom of Saudi Arabia
PTSD    post-traumatic stress disorder
RAS    Reimbursable Advisory Services
SAR    special administrative region (Hong Kong)
SCDC    Saudi Center for Disease Control and Prevention
WB    World Bank
WHO    World Health Organization
ABSTRACT

Viral outbreaks and economic contraction precede increased mental health symptoms in the population. This paper reviews existing literature, following the COVID-19 pandemic and the subsequent economic recession, on mental health among four vulnerable populations with the objective of making recommendations to mitigate the mental health consequences of the COVID-19 pandemic in the short, medium, and long term. The paper examined 20 studies concerning mental health and the COVID-19 pandemic among unemployed adults, youth, older-age populations, and healthcare workers that took place January–June 2020 and were published by September 2020. Mental health disorders and symptoms included depression, anxiety, post-traumatic stress, suicidal ideation, self-harm, and substance abuse measured across 13 countries and administrative regions. During the COVID-19 pandemic, vulnerable populations such as unemployed adults, youth, older-age populations, and frontline healthcare workers have an increased risk of mental health symptoms and disorders. Unemployment and economic instability increase symptoms of distress, depression, anxiety, suicidal ideation/self-harm, and substance abuse after COVID-19, with responses appearing especially strong among migrant workers. Among youth, those aged 18–24 years exhibit increased symptoms. In the older-age population, women experience greater depression and anxiety during the pandemic. Nurses and other intermediate-level healthcare workers have increased symptoms of distress. Using a global mental health perspective, we recommend several key policies. These policies may not only reduce the burden of mental disorders during viral outbreaks but also promote health equity, the development of human capital, and sustained productivity of the workforce. Further research should examine the mental health consequences of COVID-19 among other vulnerable groups, including those who have contracted the virus and those who have a preexisting mental disorder. Fully understanding the mental health consequences of COVID-19 can assist with development and country planning for the infrastructure required to handle future pandemics.

Keywords: mental health; COVID-19; coronavirus disease; economic contraction; recession; mental disorder; mental illness; global mental health
PART I – INTRODUCTION

As the leading cause of disability worldwide, mental disorders affect more than 750 million people.\(^1\) Globally, two-thirds of individuals with a mental disorder never receive care.\(^2\) In low- and middle-income countries, up to 85% of serious mental disorder cases do not receive treatment.\(^3\) Emergence of coronavirus disease 2019 (COVID-19) and the subsequent pandemic may have substantial implications for mental health worldwide. By January 2021, the World Health Organization (WHO) confirmed more than 84 million cases of COVID-19 and 1.8 million deaths across the world.\(^4\)

Mortality figures indicate a global mortality rate and burden of disease due to COVID-19 that is much greater than the recent H1N1 pandemic. Although symptoms of COVID-19 and H1N1 remain similar, COVID-19 has a higher percentage of severe and lethal cases.\(^5\) Whereas H1N1 led to 151,700–575,400 deaths,\(^6\) COVID-19 has so far led to approximately 1.8 million deaths.\(^5\) The pandemic, moreover, claims more lives each month, given the fact that previously uninfected populations remain immunonaive.\(^4\)

Because of the rapid spread of the virus, countries have attempted to “flatten the curve” of the pandemic.\(^7\) This strategy involves reducing the number of new COVID-19 cases per week and preventing healthcare systems from being overwhelmed.\(^7\) Countries have also implemented several preventive measures including quarantining citizens, providing testing, limiting travel, tracing contacts, and cancelling large gatherings.\(^8\) COVID-19 and the related policy responses, however, have resulted in substantial economic, social, and psychological difficulties for most populations.\(^8\)

The United Nations International Labour Organization (ILO) finds that the economic effects of COVID-19 on the world appear worse than the 2008 recession.\(^9,10\) The ILO predicts that lockdown efforts will affect more than 2.7 billion workers—four out of every five individuals in the workforce.\(^9\) The International Monetary Fund forecasts that the pandemic will shrink the economy by 4.9% this year, resulting in the deepest recession since World War II.\(^11\) Additionally, the World Bank’s Global Economic Prospect Report shows that the pandemic could shift up to 100 million people into extreme poverty.\(^12\)

Economic strain, job loss, social isolation, possible virus contraction, and the death of loved ones can have lasting mental health implications. Significant changes to daily life such as unemployment, working from home, or home-schooling youth can also exacerbate feelings of uncertainty and fear regarding the pandemic and its economic impact.\(^13\) Evidence from past studies conducted on the impact of epidemics on mental health finds that they cause fear, anxiety, emotional distress, and post-traumatic stress symptoms. These responses, in turn, may leave long-term cognitive and mental health sequelae on the population.\(^14\) Health anxiety, which refers to anxiety about one’s health, has increased in previous pandemics.\(^15\) Low health anxiety can lead to ignoring public health advice, whereas high health anxiety can result in excessive medical assistance, hoarding essential goods, and disseminating negative messaging.\(^15\) Many have described the mental health problems triggered by viral outbreaks as the “parallel pandemic.”\(^15\) Some countries report the population prevalence of depressive symptoms have increased substantially since the outbreak.\(^16,17\) One country reports a three-fold increase in depressive symptoms during the COVID-19 pandemic.\(^17\) However, overall suicide rates do not appear to rise in the United States and even show a decrease in other countries.\(^18–20\)
Mental health difficulties can, in turn, adversely impact economic growth.21,22 Experts project the global economic costs of mental disorder to exceed US$16 trillion from 2010 to 2030.21,22 This projection includes both direct and indirect economic costs, including the following: (1) healthcare costs, (2) productivity losses, and (3) income losses.22 Table 1 shows examples of direct and indirect costs associated with mental disorder. Direct costs consist of “visible” costs associated with diagnosis and treatment in the healthcare system, whereas indirect costs include often “invisible” costs such as productivity and income losses.22

In terms of productivity losses, individuals with mental disorders prove more likely to call in sick, take extended absences, and have less productive hours while at work.23 Approximately 30–40% of sickness and disability cases result from mental disorders in Organisation for Economic Co-operation and Development (OECD) countries.23 Whereas most individuals with mental disorders do work, those with mild to moderate depression or anxiety are twice as likely to become unemployed.23 Premature mortality in individuals with mental disorders subsequently leads to income losses and lost human potential.23 For example, individuals with bipolar depression or schizophrenia have a mortality rate four to six times higher than the general population.23 Based on data from 2010, the global economic cost of mental disorder is estimated at US$2.5 trillion. Indirect costs (US$1.7 trillion) exceeded direct costs (US$0.8 trillion).22 This pattern contrasts with noncommunicable diseases such as cardiovascular disease (CVD) and cancer in that healthcare costs associated with these diseases (i.e., chemotherapy, CVD medications) outweigh their productivity losses and income losses overall.22,24 Given the economic burden of mental disorders, COVID-19 may continue to impede economic growth.

### Table 1. Direct and indirect costs associated with mental health22

<table>
<thead>
<tr>
<th>Healthcare costs</th>
<th>Productivity losses</th>
<th>Income losses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct cost</td>
<td>Indirect cost</td>
<td></td>
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<tr>
<td>○ Medication</td>
<td>○ Work absences</td>
<td>○ Mortality</td>
</tr>
<tr>
<td>○ Physician’s visits</td>
<td>○ Early retirement</td>
<td>○ Disability</td>
</tr>
<tr>
<td>○ Psychotherapy</td>
<td>○ Not pursuing further education</td>
<td>○ Care-seeking</td>
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<tr>
<td>○ Hospitalization</td>
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This paper examines the global implications of COVID-19 on mental health, with a focus on four particularly vulnerable populations: (1) unemployed adults; (2) youth; (3) older-age populations; and (4) healthcare workers. Considering the global public health burden of mental disorders, understanding COVID-19’s psychological impact on vulnerable populations may provide policy makers with the information necessary to effectively direct resources. The paper focuses on these populations because racial, gender, and social class disparities endure in most educational and work opportunities.25 Additionally, health systems and work environments can perpetuate inequality among vulnerable populations, often leading to worse health outcomes.25 Previous pandemics and natural disasters have exacerbated income and health disparities for vulnerable populations.25 Similarly, the economic shutdown may disproportionately affect low-income or racial minority workers who work in sector most affected by COVID-19.25
Youth and older populations remain vulnerable because of factors associated with their age, whereas frontline healthcare workers face overwhelmed health systems and a higher risk of infection.\textsuperscript{26,27} Focusing on these vulnerable populations, the narrative review summarizes the literature addressing mental health and the COVID-19 pandemic.

This paper is organized as follows: the next section summarizes current literature on the psychological impact of COVID-19 on four vulnerable populations. The following section then summarizes the findings for each of the populations, followed by a section discussing those results. The next sections provide an understanding of the current state of global mental health and recommend short-, medium-, and long-term policy solutions.
PART II– METHODOLOGY

The current article provides a narrative review of the literature on mental health related to the COVID-19 pandemic in four vulnerable populations: (1) unemployed adults, (2) youth, (3) older-age populations, and (4) healthcare workers. PubMed and Google Scholar are used to identify publications in English, including data on COVID-19 and mental health. Searches were made for publications using the terms “coronavirus”, “novel coronavirus”, “COVID-19”, “covid”, “mental health”, “psychological distress”, “acute stress”, “anxiety”, “depression”, “stress”, “unemployed”, “unemployment”, “migrant”, “older-age”, “elderly”, “adolescent”, “youth”, “health care workers”, and “frontline healthcare” in various combinations. An abstract review was then completed, along with a full-text review, to find publications that presented data related to mental health and the COVID-19 pandemic in the four vulnerable populations of interest.

As seen in Figure 1, 57 relevant publications were identified for the four vulnerable populations of interest. Twenty-four manuscripts from PubMed and 33 manuscripts from Google Scholar were identified. During the abstract and full-text review, we excluded nine articles not written or translated into English were excluded. An additional 28 manuscripts were excluded because they did not relate to the mental health during the pandemic in the four vulnerable populations of interest. Instead, they reported mental health among the general population, preventive mental health measures, mental health clinical trials findings during pandemic, and mental health care system reform.

**Figure 1.** Manuscript selection and exclusion process for narrative review on mental health and COVID-19 among unemployed adults, youth, older-age populations, and healthcare workers

- Manucripts identified in PubMed database ($n = 24$)
- Manuscripts identified in Google Scholar database ($n = 33$)
- Manuscript abstracts screened ($n = 57$)
- Manuscripts excluded ($n = 9$)
- Full text manuscripts assessed for eligibility ($n = 48$)
- Manuscripts excluded ($n = 28$)
- Manuscripts included in narrative review ($n = 20$)
The narrative review allowed us to give priority to the observational studies available among the four vulnerable populations and identify salient themes as they relate to mental health and the COVID-19 pandemic.
PART III – RESULTS

Twenty articles were identified examining the empirical relation between COVID-19 and mental health in the four vulnerable populations. One study provided longitudinal data and the other 19 studies used a cross-sectional design. Researchers conducted all studies between January and June 2020; sample sizes varied from 243 to 52,730. Studies from 13 countries and administrative regions were incorporated into the narrative review: the Islamic Republic of Iran; Bangladesh; Spain; China, Hong Kong SAR, China; Macau, China; Taiwan, China; India, the United States; Bosnia; the United Kingdom; Sweden; and Israel. Eight studies focused on the unemployed workforce, four studies examined youth, three studies examined the older-age population, and five studies focused on healthcare workers (Table 2). Studies utilized extensively validated scales, including the Patient Health Questionnaire, the Generalized Anxiety Disorder scale, the Warwick Edinburgh Mental Wellbeing Scale, the Post-traumatic Stress Disorder Checklist, and the Center for Epidemiological Studies Depression Scale, as well as the COVID-19 Peritraumatic Distress Index and surveys developed by researchers to measure mental health symptoms.

Table 2. Referenced research on mental health and COVID-19 among unemployed adults, youth, older-age populations, and healthcare workers

<table>
<thead>
<tr>
<th>Population</th>
<th>COVID-19 review references</th>
<th>Other literature</th>
</tr>
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<tbody>
<tr>
<td>Unemployed adults</td>
<td>Jahanshahi et al., 2020 (n = 1,058)</td>
<td>Burgard et al., 2009</td>
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<tr>
<td></td>
<td>Hossain et al., 2020 (n = 1,404)</td>
<td>Catalano et al., 2000</td>
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<td></td>
<td>González-Sanguino et al., 2020 (n = 3,480)</td>
<td>Goldman-Mellor et al., 2010</td>
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<tr>
<td></td>
<td>Qiu et al., 2020 (n = 52,730)</td>
<td></td>
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<tr>
<td></td>
<td>Kumar et al., 2020 (n = 98)</td>
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<tr>
<td></td>
<td>Fitzpatrick et al., 2020 (n = 10,368)</td>
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<td></td>
<td>Šljivo et al., 2020 (n = 1,201)</td>
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<td></td>
<td>Iob et al., 2020 (n = 44,775)</td>
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<tr>
<td>Youth</td>
<td>Liang et al., 2020 (n = 584)</td>
<td>Liang et al., 2020</td>
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<td></td>
<td>Chang et al., 2020 (n = 119)</td>
<td>Powdthavee &amp; Vernoit, 2013</td>
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<tr>
<td></td>
<td>Islam et al., 2020 (n = 476)</td>
<td>Nikolova &amp; Nikolaev, 2018</td>
</tr>
<tr>
<td></td>
<td>Czeisler et al., 2020 (n = 5,412)</td>
<td>Buckner et al., 2004</td>
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<tr>
<td>Older-age populations</td>
<td>Meng et al., 2020 (n = 1,556)</td>
<td>Goldman-Mellor et al., 2010</td>
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<tr>
<td></td>
<td>Gustavsson et al., 2020 (n = 1,854)</td>
<td>Breslin &amp; Mustard, 2003</td>
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<td></td>
<td>Bergman et al., 2020 (n = 243)</td>
<td>Brand et al., 2008</td>
</tr>
<tr>
<td>Healthcare workers</td>
<td>Lai et al., 2020 (n = 243)</td>
<td>Imai, 2020</td>
</tr>
<tr>
<td></td>
<td>Li et al., 2020 (n = 1,257)</td>
<td>Ricci et al., 2020</td>
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<tr>
<td></td>
<td>Cai et al., 2020 (n = 534)</td>
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<tr>
<td></td>
<td>Shechter et al., 2020 (n = 657)</td>
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<tr>
<td></td>
<td>Kannampalli et al., 2020 (n = 1,375)</td>
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</table>
This review was integrated into other literature that describes the broader implications on mental health of policy-related COVID-19 responses that arguably produced an economic recession. Three studies focused on unemployed adults, four examined youth, three studies focused on older-age populations, and two studies examined healthcare workers. An extensive body of literature documents elevated mental disorders among persons who lose work. In addition, among persons who remain working during a recession, depression and anxiety also are documented to increase. This literature, which focuses on job loss and economic recessions that predate COVID-19, are useful in projecting the population mental health response to COVID-19 and its related economic recession.

Unemployed Adults

The COVID-19 pandemic has resulted in shutting down most sectors of the economy, causing sudden unemployment among adults in the majority of the global workforce. Economic activity among developed countries will shrink by 7%, whereas among developing countries it will shrink by 2.5%. Per capita incomes are expected to decline by 3.6%, forcing millions into poverty. Some industrialized countries, such as Canada, have tried to implement social safety nets or subsidies for those in need. Other low-income countries lack the ability to effectively provide monetary assistance. This circumstance indicates that economic shutdowns will increase joblessness and poverty for many, precisely at times when countries are unable to provide social safety nets.

Extensive literature documents that job loss increases the risk of major depression, anxiety, and other mood disorders among the unemployed, globally. In the United States, two longitudinal studies regarding economic contractions find that job loss unrelated to health significantly increases risk of depressive symptoms even after controlling for labor force experience, mental ability, and socioeconomic variables. A systematic review of economic contractions and mental health reports that losing a job or transitioning to another while in an insecure job increases symptoms of depression by two-fold when compared to having secure employment.

Studies in the United States, the Islamic Republic of Iran, Bangladesh, and Bosnia find increased levels of distress among unemployed individuals during the pandemic. A study in the United States finds depressive symptoms among those who classify as unemployed, laid off, or furloughed. With depleted resources, nonworking individuals may experience more depressive symptoms than working adults. The study consisted of a representative sample of 10,368 adults. Results indicate that individuals classified as unemployed, laid off, or furloughed have greater depressive symptomology than those working during the pandemic. Evidence from the Islamic Republic of Iran finds that adults who stopped working or became unemployed during COVID-19 have higher levels of distress and lower levels of mental well-being. Adults who stopped working during COVID-19 also reported higher levels of stress than those who telecommuted, worked at the office, or did not work before the pandemic.

Similarly, a cross-sectional study conducted in Bangladesh indicates that unemployed adults have lower mental well-being scores than individuals who work from home and individuals who continued to work outside the home. A study in Spain, conducted at the beginning of the COVID-19 crisis, documents that economic instability and unemployment correspond to greater symptoms of anxiety and depression. Evidence
from Bosnia also reports that unemployment predicts moderate to severe depressive symptoms in association with COVID-19. Among unemployed individuals, 54.9% reported moderate depressive symptoms, 21.6% reported moderately severe depressive symptoms, and 23.5% reported severe depressive symptoms.34

In the United Kingdom, study results extend to increases in self-harm/suicidal thoughts and self-harm behaviors among unemployed individuals and seeking work. 35 Approximately 37.5% of unemployed individuals seeking work reported self-harm/suicidal thoughts and 12.2% reported self-harm behaviors.35

The pandemic may have substantial implications for migrant workers, in particular, as two studies from Asia find increases in mental health symptoms. In a survey of 52,730 individuals from China; Hong Kong SAR, China; Macau, China; and Taiwan, China, one study used the COVID-19 Peritraumatic Index.31 Migrant workers may have concerns about not working, not having an income, housing difficulties, and using public transportation when returning to work, resulting in the highest levels of distress among all occupations.31 This result, if replicated, indicates that workers with relatively low wages at the outset may appear most vulnerable not only to layoffs but also to adverse consequences of sustained economic contraction. A study in India reports that the lockdown measures imposed on migrant workers have significant implications as they can neither work nor travel to their native locations and are often living in crowded accommodations. About 73.5% screened positive for depressive symptoms and 50% screened positive for anxiety symptoms.32 More than half report markedly increased loneliness and increases in tension and frustration.32

Youth

Youth remain particularly vulnerable during the COVID-19 pandemic. Youth aged 15 to 24 years undergo a critical developmental period that appears sensitive to external stressors and adversity.15 These external stressors could include a disruption from the routine school schedule or social isolation due to COVID-19-related social distancing measures. Youth with special needs such as autism may face reduced access to individualized learning accommodations because of school closures.26 Literature finds that school closures correspond with increased levels of distress. A previous study conducted in the United Kingdom found that, among youth with mental disorders, 83% report that school closures make their mental health worse while 26% cannot access mental health support outside of school.57 Additionally, a poll conducted in Hong Kong SAR, China, finds that 20% of students unable to take college entrance exams because of previous epidemics experience severe stress.57

Changes in family dynamics due to job loss of a parent or violence in the home resulting from lockdown restrictions may exacerbate youth mental disorder during the COVID-19 pandemic.15 Longitudinal studies in the United Kingdom and Germany find that parental unemployment corresponds negatively with youth happiness as youth become older.42,43 Extensive literature also finds that violence in the home varies positively with adverse mental health. A study conducted on low-income youth in the United States reports that 62% experienced a form of violence at home.44

Three studies find increased mental health disorder in older youth during COVID-19. In the United States, a study finds that individuals aged 18–24 have significantly greater prevalence of anxiety and depressive symptoms, suicidal ideation, and substance use
than those older than 24. The study sample comprised 5,412 individuals over 18 years of age. Researchers supplemented scales with additional questions regarding suicidal ideation and substance use. Among individuals 18–24 years of age, 49.1% reported symptoms of anxiety, 52.3% reported symptoms of depression, 25.5% seriously considered suicide in the past 30 days, and 24.7% started or increased substance use to cope with the pandemic. Prevalence of anxiety/depressive symptoms decreased progressively with older age groups. A study in Bangladesh also finds that older students experienced greater symptoms, with more than 80% reporting mild to severe depression or anxiety. Students who did not exercise, who were academically lagging, and who lived with their parents or in urban neighborhoods had increased depressive symptoms. Another study in China reports increased depressive symptoms among females in college.

Alternatively, a study in China indicates that during COVID-19, psychological problems concentrate among younger youth. Approximately 40.4% of the sample reported having psychological problems, 14.4% of whom had PTSD symptoms. Participants who had less than a junior high school education reported more psychological symptoms than did older participants.

**Older-Age Populations**

Older-age populations may face social isolation or other health conditions during COVID-19, thereby exacerbating existing disorders. In countries where older adults live alone more often than in intergenerational households, lockdown efforts may force isolation—a risk factor for adverse mental health. Additionally, like youth, older adults may not have the capability to reach out for help if they face violent or neglectful situations at home. Lastly, older-age populations living in nursing homes may face heightened mental disorder as COVID-19 has spread extensively in older-age nursing homes.

Older adults may show particular increases in mental disorder following unemployment. A cross-sectional study in Canada indicates that unemployment among older adults, as opposed to young adults, corresponds with psychological distress and symptoms of depression. Scholars suggest that older age may imply greater financial and familial responsibility. A longitudinal study in the United States examining the how layoffs and plant closures correspond with depression among older workers finds that older men have significant increases in depression after layoffs while women experience symptoms after plant closures.

Studies in China and Sweden report that older-age adults, specifically women, experience more symptoms of anxiety and depression during COVID-19. In China, researchers conducted a survey among 1,556 seniors ranging between 60 and 80 years old. Approximately 37.1% of seniors experienced symptoms of depression and anxiety. The study found gender differences in the emotional response, with women experiencing more depression and anxiety than men. Evidence from cities in Sweden find comparable increased depression among adults aged 70 and older. Researchers report that 38.8% individuals felt depressed in relation to the pandemic. More women felt depressed than men (44.4% and 25.7%, respectively). Additionally, 46% of single individuals reported feeling depressed whereas 33.5% of non-single individuals felt depressed.
Another study conducted in Israel finds increased anxiety symptoms among older-age adults.\textsuperscript{46} Originally portrayed as a problem for older-age adults, COVID-19 responses have increased ageism with policies and societal expectations that older-age adults should isolate themselves from younger generations.\textsuperscript{46} Results indicate that health concerns and ageism positively correspond with anxiety symptoms among older-age adults.\textsuperscript{46}

**Healthcare Workers**

Frontline healthcare workers face a unique challenge during the COVID-19 pandemic because of increased workload and hours, in addition to stress and anxiety resulting from the possibility of infection.\textsuperscript{51} One study in Canada finds that one-third of all infections concentrate in healthcare workers.\textsuperscript{15} Overwhelmed healthcare systems may amplify further stress resulting from a shortage of personal protective equipment, a lack of ventilators, and the frequent need to make life-or-death decisions under extreme conditions.

Previous viral outbreaks increased mental health symptoms among frontline healthcare workers. A study from the previous H1N1 pandemic in 2009 documents that health professionals experienced increased anxiety while working.\textsuperscript{54} A cross-sectional study conducted in Japan finds that 14.7\% of healthcare employees faced extreme hesitation about working during the pandemic from fear of being infected, of not being compensated if infected, and from feeling isolated.\textsuperscript{54} Additionally, a systematic review of the mental health of healthcare workers following the SARS epidemic and the H1N1 pandemic finds anxiety to be the most prevalent mental disorder among healthcare workers (45\%), followed by depression (38\%) and acute stress disorder (31\%).\textsuperscript{55} Sociodemographic factors associated with adverse mental health included younger age, female gender, and less work experience.\textsuperscript{55}

Evidence from cities in China and the United States indicate a high risk of mental health symptoms among frontline healthcare workers, specifically among women and intermediate professionals.\textsuperscript{49} A cross-sectional study conducted a survey among 1,257 healthcare workers in 34 hospitals report frontline healthcare workers who were women and those who were engaged in direct treatment of COVID-19 had a higher risk of symptoms of depression, anxiety, and distress. Another study conducted in China reports that nurses felt most anxious in COVID-19 wards.\textsuperscript{51} They also found that all healthcare workers worried about infecting their families and felt stress seeing COVID-19 patients die.\textsuperscript{51} In a New York City medical center, a cross-sectional study examined mental health among physicians, advanced providers, residents/fellows, and nurses.\textsuperscript{52} Approximately 57\% of healthcare workers reported acute stress symptoms, 48\% reported depressive symptoms, and 33\% reported anxiety symptoms.\textsuperscript{52} Nurses and advanced practice providers had greater mental health symptoms than attending physicians (64\% vs. 40\%, respectively).\textsuperscript{52}

Similarly, another study in China finds increased symptoms of depression and anxiety among early-career physicians during COVID-19.\textsuperscript{50} A cohort study in China surveyed 385 young physicians surveyed two weeks before starting their residency, three months after starting (before COVID-19), and six months after starting (during COVID-19).\textsuperscript{50} Researchers found that daily mood scores decreased and symptoms of depression and anxiety increased.\textsuperscript{50} An additional study in the United States compared physician trainees who had been exposed to COVID-19 patient testing and those who had not
been exposed. Study results find that the exposed group had a higher prevalence of stress (29.4% vs. 18.9%) and burnout (46.3% vs. 33.7%) when compared with the non-exposed group. The study found that female and unmarried physician trainees had greater symptoms.
PART IV – DISCUSSION

During the COVID-19 pandemic, vulnerable populations such as unemployed adults, youth, older-age populations, and frontline healthcare workers have an increased risk of mental disorders such as depression, anxiety, distress, post-traumatic stress disorder, and suicidal ideation/self-harm. Eight studies find that unemployment and economic instability increased symptoms of distress, depression, anxiety, and suicidal ideation/self-harm, and substance abuse after COVID-19.28–35 These responses appear especially strong among migrant workers.31,32 Among youth, younger adolescents exhibit increased symptoms of depression, anxiety, suicidal ideation, self-harm, and substance abuse during COVID-19.26,39–41 In the older-age population, women experience greater symptoms of depression and anxiety during the pandemic.27,45,46 Lastly, among healthcare workers, nurses and other intermediate-level healthcare workers, as well as women, have increased symptoms of depression and anxiety.49–51 Among early-career physicians, depression and anxiety increased throughout the course of the pandemic.49,51,52

The mass unemployment from COVID-19 affects four out of five workers globally.9 For many, social safety nets from the federal government are minimal to non-existent.15 Those living in poverty have a higher risk of mental disorder as they cannot access care readily.15 Youth represents a critical period of development.15 The closure of in-person schools may not only disrupt the formation of educational capital but also increase the risk of social isolation and attendant mood disorders. Additionally, youth with special needs may not receive necessary assistance during school closures. The older-age population may experience increased social isolation due to lockdown measures.58 Lastly, frontline healthcare workers may face elevated stress levels due to a drastically increased workload, the possibility of infection, and the possible shortage of personal protective equipment.15,51

Substantial death and illness, spurred by the pandemic, takes a toll on the economy and human capital.60 Spanning across countries, and likely generations, the health and economic effects may exacerbate already existing disparities across educational and economic sectors.60 Health system disruptions, school closures, income effects, and food insecurity due to the COVID-19 pandemic all adversely affect the formation of human capital.60 These sequelae may also, in the long term, diminish human capital accumulation over the life course—ranging from school attainment and learning to unemployment and loss in wages and assets later in life.” 60

Further research should examine the mental health sequelae of COVID-19 on other vulnerable groups, including those who have contracted COVID-19 and those who have a preexisting mental disorder. Additionally, adverse mental health may have deleterious effects on physical health, spurring exacerbated physical conditions such as high blood pressure. Further research would benefit from understanding how mental health may have exacerbated physical health conditions following COVID-19. To fully understand the mental health consequences of the pandemic, research must also evaluate whether healthcare systems can manage the rise of symptoms and mental disorder in the population.15 Unlike natural disasters, pandemics have no well-defined start or end date—as evidenced by certain countries potentially entering a second wave of COVID-19.15 The determinantation of when communities can return toward normalcy remains
unknown.15 Because of this, mental health care systems must adapt and policies must be put in place. Adaptations and policies may require changes within multiple sectors of mental health service delivery, such as education-, social services–, and employer-based interventions targeting at-risk populations.
Depression is the leading cause of disability worldwide, which stems from a multitude of factors. First, a treatment gap exists between those who have mental disorders and those who receive treatment. In some countries, up to 80% of persons with a mental disorder do not receive treatment. Second, financial resources allocated for mental health remain alarmingly low. Third, although pharmacological and other clinical interventions (i.e., antidepressants) are cost-effective, they are underutilized and therefore have had limited effects on overall levels of population mental health. Finally, transitions—such as the current COVID-19 pandemic—expand income inequality and exacerbate economic and political uncertainties. These uncertainties, in turn, may disproportionately affect the mental health of lower-income, disadvantaged, and already marginalized populations.

In 2013, the WHO adopted a comprehensive Mental Health Action Plan 2013-2020 for Member States. This landmark achievement aimed to promote mental well-being; prevent mental disorders; provide care; enhance recovery; promote human rights; and reduce the mortality, morbidity, and disability for persons with mental disorders. The Action Plan involved the WHO, international partners, and national ministries of health. Given the diversity of countries involved, each government adapted the Action Plan according to their national circumstances. The WHO Atlas Project set core indicators to measure progress for individual Member States. The Action Plan had four objectives: (1) strengthen effective leadership and governance for mental health; (2) provide comprehensive, integrated, and responsive mental health and social care services in community-based settings; (3) implement strategies for promotion and prevention in mental health; and (4) strengthen information systems, evidence, and research for mental health.

In 2015—for the first time—the United Nations included mental health as a Sustainable Development Goal. Leaders around the world committed to the prevention and treatment of noncommunicable diseases, including behavioral, developmental, and neurological disorders, which constitutes a major challenge for sustainable development. This announcement by the United Nations presented an opportunity to increase coverage and quality of mental health services and reduce the treatment gap. In 2018, the Lancet Commission on global mental health broadened the global mental health agenda to include reducing the proportion of the global burden of disease attributable to mental disorders. The commission issued seven key messages and recommendations, as seen in Figure 2.
Global Mental Health Messages and Recommendations

1. Mental health needs to be reframed within the sustainable development framework;
2. Mental health care is an essential component of universal health coverage;
3. Protect mental health with public policies and development efforts;
4. Strengthen public awareness and engagement of people with mental disorders;
5. Investments for mental health should be enhanced;
6. Innovation and implementation should be guided by research; and
7. Strengthen monitoring and accountability for global mental health.

The COVID-19 pandemic puts forth an unprecedented challenge, globally, for individuals, governments, and health systems. Although the previous H1N1 pandemic spurred many G7 countries to develop better plans to handle viral outbreaks, no country was adequately prepared for COVID-19. The overall mental health consequences of the pandemic remain to be fully understood. However, efforts within public policy and health systems should be made within the context of the current global mental health initiatives. Recommending policies within the current context will allow for global stakeholder support and provide solutions rooted in evidence-based concepts.
Eight policies are recommended, consistent with current global mental health initiatives, to mitigate short-, medium-, and long-term sequelae of the COVID-19 pandemic. These are summarized in Figure 3.

1. **Short Term: Public Mental Health Messaging**

Public service announcements focusing on mental health may allow the public to foster resilience and recovery during the pandemic. Public health messaging through media outlets during the COVID-19 pandemic has centered around personal hygiene, spatial distancing, respiratory etiquette (i.e., wearing a mask), contact tracing, and staying indoors. Extending such messaging to positive coping mechanisms or resources for mental health care may provide populations with support and information on how to access care. Research finds that the ability to communicate health information clearly and effectively during a pandemic remains crucial to relieving health anxiety. Messaging also needs to be accurate; for example, *social distancing* is an unfortunate term encouraging social isolation, while the correct message should be *spatial distancing* and *social closeness*. Scholars also suggest creating a communication infrastructure prior to a crisis. Public service messaging may reach vulnerable populations such as older-age adults and youth through television news outlets or social media platforms. The use of traditional and culture-sensitive methods of messaging may also reduce uncertainty and anxiety. Consistent with the Lancet Commission’s recommendation, issuing mental health public service announcements will enforce mental health as a global public good—confirming that mental health remains critical for everyone, not just for those with biomedically defined mental disorders.

2. **Short Term: Surveillance of Mental Health Outcomes**

Surveillance of mental health outcomes during the pandemic may provide the information necessary to manage increased disorder. This may include monitoring psychiatric hospital visits, community mental health visits, and suicide prevention hotlines because suicidal ideation and self-harm have increased during the pandemic. This surveillance may particularly benefit healthcare workers as sufficient staffing in low-resourced areas may support the demand for increased care. Additionally, tracking gaps in mental health service delivery needs—such as staffing at community health centers and mental health budgeting—may further benefit the ability to appropriately match the workforce supply to the mental health needs of the specific population groups (e.g., young adults).

3. **Medium Term: Task Sharing to Provide Support**

Task sharing from healthcare providers to volunteers may help increase uptake by health systems. Task sharing refers to the redistribution of tasks among health workforce teams. Specific tasks typically move from highly qualified health workers to those with fewer qualifications. Task sharing allows frontline healthcare workers to concentrate on COVID-19 patients, while others may focus on mental health symptoms. Scholars suggest using trained volunteers to provide peer and psychosocial support for mental health. This may particularly benefit older-age
populations, as trained volunteers can deliver simple psychosocial interventions and communicate with individuals to prevent isolation, a key risk factor for adverse mental health.\textsuperscript{15,62} Task sharing provides an opportunity to reach vulnerable populations as volunteers often provide a grassroots approach. Task sharing also coheres with a key recommendation of the Lancet Commission—strengthening public awareness and engagement of people with mental disorders.\textsuperscript{62} Using volunteers for mental health campaigns engages civil society with mental health problems.\textsuperscript{62}

4. \textit{Medium Term: Improved Governance, Resources, and Availability of Mental Health Services}

Improving mental health governance, resources, and the availability of services may provide the infrastructure necessary to reduce disorder.\textsuperscript{71} Among those with severe mental illness, this may include treatment in the national health insurance or reimbursement scheme.\textsuperscript{71} Further behavioral health training for primary care physicians may also benefit increased demand for mental health care.\textsuperscript{72} Particularly benefiting children, the WHO recommends developing strategies to prevent and treat mental health disorders for this particularly vulnerable age group.\textsuperscript{71} The WHO also recommends integrating mental health care within overall health services by training non-specialized healthcare providers as a method for scaling up care for entire communities.\textsuperscript{73}


Social and economic protection measures guard individuals from pandemic-related mental health adversities.\textsuperscript{13} The financial and mental health consequences of the pandemic can have lasting impressions on individuals’ lives and further perpetuate inequality among vulnerable groups.\textsuperscript{13} By including the mental health of vulnerable groups as a factor in the national response to COVID-19, communities can rebuild and recover sooner than anticipated.\textsuperscript{13} However, this requires implementing social and economic policies for future protection.\textsuperscript{13} For example, children may benefit from the implementation of alternative learning opportunities, and women and older adults may benefit from domestic violence prevention efforts. Lastly, healthcare workers may benefit from anti-discriminatory campaigns at the workplace.\textsuperscript{13} Social and economic policies may mitigate long-term mental illness in high-risk populations.\textsuperscript{13} Additionally, developing public policy to protect mental health remains one of the Lancet Commission’s global mental health recommendations.\textsuperscript{62}

6. \textit{Long Term: Investment in Virtual Mental Health Care Platforms}

Investment in virtual mental health care platforms will prepare countries for the mental health consequences of the next pandemic. Social distancing measures and lockdown efforts have made many in-person mental health care platforms, such as psychiatry and primary care, inaccessible.\textsuperscript{15} The pandemic forced many providers to close in-person operations while some have improvised by using online platforms.\textsuperscript{15} Additionally, emergency departments and community health centers, often used for psychiatric needs, remain overwhelmed with COVID-19 cases. Investment in virtual stepped care platforms that include psychoeducation, self-guided therapies, artificial intelligence, and peer-supported and specialist-supported e-therapies, as well as telepsychiatry, will allow for the infrastructure necessary to handle the mental health consequences of the next pandemic.\textsuperscript{15,74} With the rapid spread of smartphones and artificial intelligence, virtual
tools offer new opportunities for mental health care and reach far wider audiences. From self-care and wellness phone applications to online diagnosis and treatment, virtual mental health care can provide the support needed during a global pandemic as well as reduce the burden on healthcare workers. Tele-mental health and e-mental health options may particularly benefit adolescents, as shown in previous literature. Additionally, embracing technological solutions remains one of the Lancet Commission’s global mental health recommendations.

7. Long Term: Financial Procurement of Social Safety-Net Funds

Invest in rainy day social safety net funds for those most affected by economic downturns. Following the Great Recession of 2008–2010, various local and federal agencies worldwide designated rainy day funds. These funds represent a non-trivial portion of the governmental budget that accrues during non-recession years and becomes available to support disadvantaged populations in the event of future economic recessions. Allocation of these rainy day funds may provide unemployment insurance for persons who lose jobs, healthcare coverage for migrant populations, and social services for persons with severe mental disorders who are at risk of homelessness. Each of these allocations, if prudently focused on subgroups considered at greatest risk of hardship, has the potential to mitigate a portion of the mental health sequelae of global economic downturns. In line with the Lancet Commission’s global mental health recommendations, rainy day funds enhance investment in mental health while also implementing new strategies guided by research.

8. Long Term: Implementation of Employer-Based Mental Health Programs

Employer-based mental health programs, such as Employee Assistance Programs (EAPs), that are implemented during employment and immediately following job loss, may provide the workforce with increased treatment for mental health disorder. Employers provide EAP programs that comprise problem-solving support for interpersonal issues, problems in the workplace, stress and anxiety, grief, and concerns about substance abuse. Implementation of these programs within essential workforce industries (i.e., healthcare, service) may prevent burnout and reduce pandemic-induced fear among working-age adults during the next outbreak. Providing these services during a grace-period following job loss may also provide a safety-net for those experiencing adverse mental health. In line with the Lancet Commission’s global mental health recommendations, employer-based mental health programs enhance investment in mental health while also implementing new strategies guided by research.
Figure 3. Policy recommendations to mitigate mental health sequelae of the COVID-19 pandemic

Short term
- Public mental health messaging
- Surveillance of mental health outcomes

Medium term
- Task sharing to provide psychosocial and peer-based support
- Improved governance, resources, and availability of mental health services

Long term
- Implementation of social and economic policies that promote and protect mental health
- Investment in virtual mental health care platforms
- Financial procurement of social safety-net funds
- Employer-based mental health programs
PART VII – CONCLUSIONS

This narrative review indicates that COVID-19 precedes an increase in mental disorders and symptoms especially in vulnerable groups such as unemployed adults, youth, older-age adults, and frontline healthcare workers. The mental health consequences are likely to persist far beyond the duration of the pandemic. Restrictions including physical distancing have shut down the economy and produced heightened poverty and social isolation for many. Careful research on the mental health consequences of COVID-19 will assist with development and planning of the infrastructure required to handle future pandemics. With a global mental health perspective, we recommend a number of key policies to mitigate short-, medium-, and long-term mental health consequences and to address the needs in the population. These policies may not only reduce the burden of mental disorders during pandemics but also promote health equity, the development of human capital, and sustained productivity of the workforce.
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Viral outbreaks and economic contraction precede increased mental health symptoms in the population. This paper reviews existing literature, following the COVID-19 pandemic and the subsequent economic recession, on mental health among four vulnerable populations with the objective of making recommendations to mitigate the mental health consequences of the COVID-19 pandemic in the short, medium, and long term. The paper examined 20 studies concerning mental health and the COVID-19 pandemic among unemployed adults, youth, older-age populations, and healthcare workers that took place January–June 2020 and were published by September 2020. Mental health disorders and symptoms included depression, anxiety, post-traumatic stress, suicidal ideation, self-harm, and substance abuse measured across 13 countries and administrative regions. During the COVID-19 pandemic, vulnerable populations such as unemployed adults, youth, older-age populations, and frontline healthcare workers have an increased risk of mental health symptoms and disorders. Unemployment and economic instability increase symptoms of distress, depression, anxiety, suicidal ideation/self-harm, and substance abuse after COVID-19, with responses appearing especially strong among migrant workers. Among youth, those aged 18–24 years exhibit increased symptoms. In the older-age population, women experience greater depression and anxiety during the pandemic. Nurses and other intermediate-level healthcare workers have increased symptoms of distress. Using a global mental health perspective, we recommend several key policies. These policies may not only reduce the burden of mental disorders during viral outbreaks but also promote health equity, the development of human capital, and sustained productivity of the workforce. Further research should examine the mental health consequences of COVID-19 among other vulnerable groups, including those who have contracted the virus and those who have a preexisting mental disorder. Fully understanding the mental health consequences of COVID-19 can assist with development and country planning for the infrastructure required to handle future pandemics.

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