

Mental Health of Communities during the COVID-19 Pandemic

The Canadian Journal of Psychiatry /
La Revue Canadienne de Psychiatrie

1-7

© The Author(s) 2020

Article reuse guidelines:

sagepub.com/journals-permissions

DOI: 10.1177/0706743720926676

TheCJP.ca | LaRCP.ca



Daniel Vigo, MD, Lic Psych, DrPH^{1,2} , Scott Patten, MD, PhD, FRCPC³ ,
Kathleen Pajer, MD, MPH⁴, Michael Krausz, MD, PhD, FRCPC¹,
Steven Taylor, PhD, RPsych¹, Brian Rush, PhD^{5,6},
Giuseppe Raviola, MD, MPH², Shekhar Saxena, MD, FRCPsych⁷,
Graham Thornicroft, PhD, FRCPsych⁸, and
Lakshmi N. Yatham, MBBS, FRCPC, MRCPsych¹

Keywords

COVID-19, mental health, substance use, epidemiology, health systems

Introduction

Many voices during the past decade foretold that viral outbreaks resulting in pandemics were all but inevitable. Epidemiologists, academics, policy makers, and multi-stakeholder simulations all pointed to critical holes in the global capacity to contain a pandemic and strived to impress upon the Governments the need to prepare health systems to avoid large-scale catastrophe due to uncontrolled viral outbreaks.¹⁻⁶ While the H1N1 pandemic did push many of the G7 countries to develop better pandemic plans, for example, the North American Plan for Animal and Pandemic Influenza, no country was adequately prepared for the COVID-19 pandemic.⁷ The global transmission of the disease was unexpectedly rapid due to asymptomatic carriers and enhanced by prevalent worldwide travel. The disease rapidly overwhelmed the health care systems of some industrialized nations.^{8,9}

As of the time this is written, there over 2.3 million confirmed cases and 160,000 confirmed deaths.¹⁰ With unknown millions of people infected and out of work, the pandemic has affected most people in the world in one way or another. Governments' responses to COVID-19 have varied widely.¹¹ Most affected countries have closed their borders and sought to isolate cases, trace contacts, and protect vulnerable populations, ultimately implementing physical distancing measures, which were enforced with controls ranging from recommendations to fines and arrests.

In addition to various physical distancing measures, isolation of cases, and contact tracing, most Governments are trying to scale up COVID-19 testing and their capacity to deliver acute and intensive unit care, while at the same time providing economic help to the millions of people left out of

work. Despite such measures, in the context of grave threats to everyone's health and livelihood, combined with the inconsistency of governance efforts, widespread adverse mental health and substance use outcomes seem likely to occur, both directly from the pandemic and indirectly from the related economic downturn. Epidemics and pandemics have long been known to impact mental health: The mental problems triggered by viral outbreaks have been described as a "parallel epidemic."¹² These mental health problems (which may follow but also precede local outbreaks) can be broken down into four subtypes based on the subpopulation affected: (a) the general population, (b) people with preexisting mental or substance use disorders, (c) people who provide essential services and are at increased risk of

¹ Department of Psychiatry, University of British Columbia, Vancouver, British Columbia, Canada

² Department of Global Health and Social Medicine; Harvard Medical School, Harvard University, Boston, MA, USA

³ Department of Community Health Sciences, Cumming School of Medicine, University of Calgary, Alberta, Canada

⁴ Department of Psychiatry, University of Ottawa, Ontario, Canada

⁵ Department of Public Health Sciences, Dalla Lana School of Public Health, University of Toronto, Ontario, Canada

⁶ Department of Psychiatry, University of Toronto, Ontario, Canada

⁷ Department of Global Health and Population, Harvard T. H. Chan School of Public Health, Boston, MA, USA

⁸ Institute of Psychiatry, Psychology and Neuroscience, King's College London, United Kingdom

Corresponding Author:

Lakshmi N. Yatham, MBBS, FRCPC, MRCPsych. Department of Psychiatry, University of British Columbia, Detwiller Pavilion, UBC Hospital, 2nd Floor, 2255 Wesbrook Mall, Vancouver, BC V6T 2A1.

Email: l.yatham@ubc.ca

infection, and (d) people who are infected by the pathogen.^{13,14}

The objective of this article is to examine the potential impact of the COVID-19 pandemic on mental health of the population, suggest areas of focus for further research, and outline strategies to support their care. As Governments attempt to mitigate the impact of the viral pandemic, we urge that investments in mental health interventions and research also be prioritized and woven into system-wide measures in order to address its mental health aftermath.

Impact of COVID-19 on Mental Health of the General Population

The concept of health anxiety is useful to understand the most common problems that emerge in the general population in the midst of a pandemic.¹⁵ Health anxiety can be considered as a trait that occurs in a continuum from low to high. Extremely high or low levels of health anxiety can have deleterious impact at the individual and community levels by leading to maladaptive behaviors. Low levels of health anxiety in the midst of a potentially deadly pandemic can lead to unrealistic optimism about one's ability to avoid contagion or to recover without consequences, leading to disregard of distancing or hygiene measures. Conversely, high levels of health anxiety can lead to dysfunctional behaviors such as stockpiling essential goods (hygiene products, food, medical supplies), thus adding to the burden on others. High health anxiety can also increase problematic help-seeking behaviors, such as demanding in-person medical services or testing in situations that go against established criteria or beyond the system's capacity to respond (e.g., for people with mild respiratory symptoms). These behaviors can occur even before a local outbreak due to psychological contagion from news reports of illness in other sites; they are continuing to present an added burden on the public and the health system.¹⁶

Mitigation of these behaviors requires a purposeful approach to risk communication.^{17,18} A combination of truthful, empathic, nonalarmist, timely announcements, coupled with evidence-based, enforceable, sustainable containment measures, is more likely to minimize maladaptive social behaviors. When public messaging is inconsistent, erroneous, dishonest, or when it resorts to denial, magical thinking, or catastrophizing (examples of all of which have been seen from Governments across the globe), the public can be expected to respond in kind, worsening the impact of the virus and even undercutting the effectiveness of rational approaches in neighboring jurisdictions.

In addition to health anxiety, the general population can be expected to bear the brunt of traumatic experiences associated with the virus and the social response: the inability to attend and adequately care for sick family members due to contact restrictions; the death of relatives, friends, and acquaintances; the inability to hold funerals, bury, and mourn the dead.¹⁹ These experiences can be expected to

result in an increase of post-traumatic stress symptoms and adjustment disorders.^{20,21}

Physical distancing and social isolation may also lead to increased stress and friction within households. People who undergo quarantine may suffer from irritability, anger, insomnia, anxiety, and depression.²² Indigenous communities may be at increased vulnerability, particularly if they live in remote areas where availability and acceptability of services is insufficient. Given the history of exposure of indigenous communities to devastating pandemics, protecting indigenous communities should be a priority. Marginalized populations may not have suitable home environments to maintain physical distancing, practice hygiene, or the means to acquire basic necessities. Migrants and refugees will be particularly vulnerable during the pandemic both because of potentially precarious housing environments and because of increased stigma, discrimination, and restrictions on their movements and rights. Substance use may increase: between 20% and 25% of Canadians aged 18 to 54 have increased the amount of alcohol they drink due to distancing measures, and the sales of cannabis has reportedly increased.^{23,24} Under these conditions, aggression and violence between family members may worsen. Women, children, older adults, and other vulnerable household members are at increased risk of experiencing or witnessing domestic violence, and they may find it more difficult to reach out for help.¹⁶ Children and adolescents in the general population may be affected differently than adults, with long-term consequences, as they are experiencing the crisis during critical biopsychosocial development periods. The effects may be positive or negative, depending on genetic vulnerability, the reactions of their parents or caregivers, and whether or not the impacts of COVID-19 are compounded by exposure to neglect or abuse.²⁵

Finally, the social response to COVID-19 has entailed shutting down most sectors of the economy, which has in turn resulted in unforeseen, sudden, mass unemployment. In the absence of countervailing economic measures, the result would be the sudden onset of mass poverty, which will disproportionately affect poor and/or nondemocratic nations, due to the inability to effectively advocate for such assistance. Economic measures are being rolled out in Canada and other industrialized nations, but issues due to the complexity of implementing such massive subsidies will leave many people vulnerable to poverty and its mental health consequences such as anxiety and depression.^{26,27}

Impact of COVID-19 on Mental Health of People with Preexisting Mental or Substance Use Disorders

People with preexisting disorders may become more vulnerable during an epidemic. They are at increased risk of medical comorbidities in general, more likely to smoke, more likely to be immunocompromised, and are therefore

specifically at greater risk of respiratory symptoms.²⁸⁻³⁰ In addition, those with serious mental illness are at increased risk of infection when admitted to psychiatric inpatient units.³¹⁻³³ These units are not designed for infection control, for example, they may have communal bathrooms, no way to separate the infected from the noninfected, no anterooms to don and doff protective equipment, and no ready access to basic infection control tools such as hand sanitizers. In addition, people with severe mental illness are more likely to be homeless or live in shelters or group homes, which puts them at a higher risk of contacting and spread of COVID-19. Outpatients may be more dependent on others for detection, management, and follow-up of the infection and—in some cases—for satisfaction of everyday needs. Given the current restrictions on contacts, people with mental disorders may become isolated and vulnerable to recurrence or exacerbation of acute anxiety, mood, or psychotic symptoms. People with stable psychopharmacological regimes may be unfamiliar with how to get their prescriptions filled in the current lockdown context.

One particularly vulnerable group are people with neurocognitive disorders, most notably due to Alzheimer, vascular, or mixed dementia. These patients will also most likely be older adults with other preexisting long-term conditions, for whom the virus seems to be particularly virulent and lethal.³⁴ Indeed, accounts from the hardest hit regions reflect the state of abandonment in which the corpses of older adults were found after they were left alone by caregivers unable or unwilling to continue providing support, as well as the rapid spread of COVID-19 in nursing homes.³⁵

People with mental and substance use disorders receiving care in the community will most likely suffer disruptions in their care. Even though some forms of mental health care and supports will be available online, special attention needs to be paid to those groups for whom online forms of care are inadequate, either due to accessibility barriers or due to the in-person nature of the services needed. Of note, for people with severe forms of substance use disorders, the COVID-19 epidemic adds fire to the simmering opioid epidemic and overdose crisis. Physical distancing measures may impede the human connections needed to get the most basic supports, from getting safe supplies to “buddying-up” for injecting. Conversely, maintaining the in-person contacts needed to provide supports to this high need population may increase exposure to COVID-19 of both users and providers. Anecdotal reports suggest that some hospitals do not offer maintenance outpatient electroconvulsive therapy due to a risk that this is an aerosol-generating procedure. All these factors have the effect of increasing the risks for relapse among people with severe mental and/or substance use disorders. An increase in overdoses has already been detected in high-risk areas, such as Vancouver’s Downtown East Side, where COVID-19 has abruptly reversed a promising decrease in overdose deaths.³⁶ Finally, compliance with physical distancing and hygiene measures may be hampered by the nature of some mental and substance use disorders

(including psychotic, personality, and most substance use disorders). Intervention protocols to support these patients and uphold their human rights while also protecting the health of providers and other community members should be developed, both for community and inpatient settings.

Impact of COVID-19 on Mental Health of People Who Provide Essential Services

People who provide essential services during the pandemic in doing so put themselves at significantly increased risk of exposure to the virus. One unique characteristic of this pandemic is the massive and open-ended nature of physical distancing measures, which leads to an expansion of what can be considered essential services. In addition to direct health and social care personnel, large parts of the retail, logistics, and industrial sectors are needed to maintain the supply of food, medications, and basic necessities. These employees will also require increased support to be able to sustainably perform their tasks without harmful stress. Grocery clerks, cashiers, and restockers will need protective equipment as well as training and support to deal with stressed—or even adversarial—clients. Truck drivers will need support and alternatives while en route due to closure of their usual stops and rest breaks. Factory and farming industry employees will also need protective equipment and training to manage exposure to potentially infected coworkers.

Health personnel will suffer increased exposure to infection, stressors, and trauma. UK experts now estimate that a third of infections are concentrated in health care workers.³⁷ In the hardest hit areas during the peak of transmission, the system may be overwhelmed (such as in Italy, Spain, and the United States). Protective equipment may be insufficient, ventilators may be lacking, and working demands and hours may become overextended. In this context, health personnel will be at increased risk of infection and forced to make life-or-death decisions under conditions of extreme stress and exertion. Preexisting conditions may become more severe, post-traumatic stress disorder (PTSD), anxiety, or mood symptoms may emerge de novo, so general mental health support and also specialized care for health workers should be prioritized and readily available.³⁸⁻⁴⁰

Impact of COVID-19 on Mental Health of People Infected by the Virus

The emotional and neuropsychiatric impacts of COVID-19 in people who have recovered will be highly variable, depending on multiple factors including preexisting vulnerabilities or resilience, the severity of illness, the provision of social support, and the experience of care.^{21,41} A large proportion of the affected population will have milder forms of COVID-19, with upper respiratory symptoms, low fever, or fatigue. Many will not know whether they had the COVID-19 infection or not. During their illness, for which they will

most likely not receive any direct care or testing, they may not see their family and friends in person for weeks, and without an active and responsive social network, they may suffer hardships due to lack of human contact, food, medicine, and other basic necessities.⁴² It is not yet known whether COVID-19 infection will leave patients with direct central nervous system consequences, as was the case with previous influenza pandemics and epidemics.⁴³ However, the widespread effects on different organs as well as the serious pathology that can result in immune system dysfunction with COVID-19 all suggest that it is likely that we will see significant postinfection neuropsychiatric sequelae.⁴¹

Although modern technology may allow for the preservation of social connections during physical distancing, complete physical isolation (in some settings called quarantine or shielding) can affect people's emotional well-being, sense of self, and purpose in life. Even milder forms of COVID-19 may include fever or subfebrile states that lead to vivid nightmares and perceptual disturbances, in addition to fatigue and bodily pain, all of which can lead to fear, hopelessness, and despair. Some people may suffer from trauma or stressor-related and adjustment disorders after being overwhelmed by the severity of the illness, after receiving care in conditions of extreme duress, or after being denied care despite their subjective need. Physical distancing measures and scarce resources may lead to people not seeking or receiving care until the clinical picture becomes dire. People may be removed from their home by strangers in protective suits, unable to properly say goodbye to their loved ones. Parents may be separated from their children; the elderly from their sons and daughters; and then isolated in a stressful medical environment, without the possibility of direct contact and communication with their families.

Directions for Future Research

In order to understand the mental health consequences of COVID-19 and determine whether the health care system is sufficiently equipped to deal with it, it is essential to focus on two areas: epidemiological research and evaluation of interventions and health systems.

With respect to epidemiology, we need representative data on the mental health consequences of the various aspects of COVID-19. Data should be from different geographic locations, stratified by common predictors such as socioeconomic status, race/ethnicity, gender, age, and past mental health status. It should include the short- and long-term psychological consequences of infection, isolation, and the socioeconomic stresses associated with the pandemic. Research on the impacts of natural hazards, such as earthquakes, wildfires, and floods, suggests that most people are resilient to stress and only about 10% of people develop mental disorders.⁴⁴ It is unclear whether these findings can be generalized to COVID-19 because pandemics are different in many important ways from natural hazards. Wildfires and floods, for example, have a clear beginning and end.

This is not the case for pandemics; the end of one wave of infection could be followed by another wave. Pandemics are fraught with uncertainties, which add to their stressful impacts.⁴⁵ Some studies of SARS survivors have reported high rates of psychopathology. A 4-year follow-up study of 70 survivors of SARS, for example, found that 44% developed PTSD.⁴⁶ Even after recovering from SARS, PTSD persisted for years in almost all (82%) of these sufferers. In order to adapt the health care system to meet emerging needs, it is essential that we obtain reliable estimates of probable psychopathology, including of long-term outcomes in the offspring of mothers pregnant during the pandemic.

Second, with respect to interventions and health services, research should cover the multiple levels and platforms of deployment: psychoeducational interventions, self-guided and supported online psychotherapies, peer-based supports, delivery of services through telehealth and expansions of outreach programs, innovative interventions that emerge in this context, and service utilization. We discuss these interventions in detail below.

Discussion and Conclusion

The COVID-19 pandemic represents a shock to humanity's fabric that is unprecedented in recent times and which may have deep and lasting consequences in our collective mental health and well-being. This shock is composed of the rapid dissemination of a mostly benign but sometimes lethal virus, the global scaleup of unprecedented physical distancing measures resulting in the shutdown of large fractions of the world's economy, and the unpreparedness of most Governments. This lack of preparation is most manifest in relation to the ability to scale-up testing and contact tracing, to deliver acute care, and to develop a coherent plan for a return toward normalcy. For better or worse, the sweeping changes in everyday life provoked by COVID-19 are taking place in an era of rapidly rising global connectedness. For better, in that our ability to pool resources to understand, cope with, eventually manage COVID-19 and more importantly, to better manage future pandemics is also unprecedented. For worse, in that the fumbled initial response in most countries has led to a 24/7 global news media spectacle of illness, death, and overwhelmed health systems.

The COVID-19 pandemic represents a global catastrophe that has upended existing health systems. As such, it represents an opportunity to identify problems and strengthen mental health systems, not only for the emergency but also for the long-term. Most notably, to improve the quality of the services delivered and increase the coverage of underserved populations by leveraging innovative delivery platforms.

Two recent innovations in mental health systems have proven their effectiveness and cost-effectiveness, yet they have been underutilized in both industrialized and developing nations: online tools and task shifting. COVID-19 has shown the insufficiency and fragility of in-person platforms

and has forced us to rapidly transition to feasible alternatives. The transition to telemedicine for delivery, training, consultation, and collaboration has been swift but precarious and improvised: Relying on Zoom, Facebook, or nonspecific platforms presents issues of reliability, privacy, and confidentiality. Also, offering online e-therapies through self-guided apps is better than nothing, but most existing tools are still underdeveloped, underevaluated, with poor user engagement, and do not leverage state-of-the-art artificial intelligence (AI) mechanisms.⁴⁷⁻⁴⁹ This is the time to invest in the development of virtual stepped care platforms that include psychoeducation, self-guided-, AI-, peer-, and specialist-supported e-therapies, as well as telepsychiatry. Such innovations should occur in the context of integrated electronic health records and platforms, and their impact should be systematically evaluated.

Second, task shifting to provide psychosocial and peer-based support is an underutilized innovation, and COVID-19 can help increase uptake by health systems. Indeed, several Governments have leveraged volunteers in the context of COVID-19, with astounding results.⁵⁰ These volunteers can be trained to provide human connectedness, psychosocial support, and importantly, perform contact tracing on an ongoing basis as we manage successive waves of COVID-19 and other pandemics.⁵¹ The combination of these two technical advances could yield a unique innovation with long-term consequences for mental health systems: The uptake of assertive online outreach, delivered by community members and peers, could become an unforeseen positive externality of COVID-19.

In this context, minimizing the predictably adverse impacts of COVID-19 on mental health and well-being becomes a priority, as does using the current opportunity to advance knowledge about the mental health aspects of pandemics. World Health Organization's Mental Health Action Plan, adopted by all health ministers,⁵² recommended preparations to deal with the mental health consequences of humanitarian emergencies. Mental health should be an integral component of universal health coverage, which will increase the systems' capacity of responding to sudden threats such as COVID-19.

For the General Population, the Following Interventions Are Necessary

- Developing a consistent risk communication strategy that provides an empathetic and evidence-based assessment of the harms already suffered, credibly estimates the harms still to come, and proposes a set of mitigating measures that are rational, evidence-based, and part of sustainable public policy. Sustainable public policy requires **both** a rational public health strategy and a rational economic strategy to curtail the virus and prevent widespread poverty.

- Scaling up psychosocial supports to people undergoing overwhelming stress or trauma. These are non-specialized services that can be provided by peers with modest training through online platforms (such as psychological first aid).

For People with Mental and/or Substance Use Disorders

- For people with common mental and substance use problems (such as anxiety, depression, alcohol or cannabis use on the milder end of the spectrum) the transition to online delivery of psychoeducation, psychotherapy, and psychopharmacology should be facilitated and evaluated.
- For people with more severe, concurrent, or complex presentations of mental and substance use disorders, essential in-person services should be reinforced, and providers trained to minimize exposure to COVID-19. Of note, assertive community treatment teams coupled with adequate emergency, inpatient, withdrawal management, and harm reduction services are the backbone of treatment delivery for the most severely affected, and they cannot be discontinued.
- For all people with mental and substance use disorders, attention to physical health should be enhanced to prevent undetected spread of the virus and worsening of chronic physical conditions.
- Protocols to deal with acute patients unable or unwilling to observe physical distancing and other containment measures need to be developed in order to protect both the person's rights and the community's health.

For People Delivering Essential Services

- For workers in general, psychosocial support should be widely available to provide information, validation, and support while they develop their tasks under increased stress and risk
- For health workers, in addition to psychosocial support, exposure to trauma or overwhelming stressors may produce emergent problems or recurrence of underlying mental or substance use conditions requiring specialist care.

For People Who Suffer the COVID-19 Illness

- Targeted outreach through online and mass media offering information and psychosocial supports for

people who may undergo stress or trauma while symptomatic or difficulties adjusting afterward. Again, these are nonspecialists delivering psychological first aid.

- For people with severe forms of COVID-19 who require close monitoring at home or inpatient treatment, online and telephone support should be available to prevent isolation and provide human connections during the time of severe illness.

In summary, the mental health and well-being of our communities will predictably suffer during and after COVID-19. A combination of rational, evidence-based public policy, risk communication, assertive online outreach, and reinforced in-person essential services is required to maintain care and expand human connections, thus mitigating the acute and long-term mental health effects of COVID-19. Research and evaluation are necessary to learn from this experience and be better prepared for future crises.

Authors' Note

The views expressed are those of the author(s) and not necessarily those of the NHS, the NIHR or the Department of Health and Social Care.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research and/or authorship of this article: GT is supported by the National Institute for Health Research (NIHR) Applied Research Collaboration South London at King's College London NHS Foundation Trust, and by the NIHR Asset Global Health Unit award. GT also receives support from the National Institute of Mental Health of the National Institutes of Health under award number R01MH100470 (Cobalt study). GT is supported by the UK Medical Research Council in relation to the Emilia (MR/S001255/1) and Indigo Partnership (MR/R023697/1) awards.

ORCID iD

Daniel Vigo, MD, Lic, Psych, DrPH  <https://orcid.org/0000-0002-4445-4122>

Scott Patten, MD, PhD, FRCP(C)  <https://orcid.org/0000-0001-9871-4041>

References

1. Shortridge KF. The next pandemic influenza virus? *Lancet*. 1995;346(8984):1210-1212.
2. Fauci AS. Pandemic influenza threat and preparedness. *Emerg Infect Dis*. 2006;12(1):73-77.
3. Brilliant L. Brilliant moves to tackle global threats. Interview by Greg Miller. *Science*. 2009;324(5926):449.
4. Fineberg HV. Pandemic preparedness and response—lessons from the H1N1 influenza of 2009. *N Engl J Med*. 2014;370(14):1335-1342.
5. Osewe PL. Options for financing pandemic preparedness. *Bull World Health Organ*. 2017;95(12):794-795A.
6. Johns Hopkins Bloomberg School of Public Health. Inaugural global health security index finds significant gaps in preparedness for epidemics and pandemics; 2019. [accessed April 25, 2020]. <https://www.jhsph.edu/news/news-releases/2019/inaugural-global-health-security-index-finds-significant-gaps-in-preparedness-for-epidemics-and-pandemics.html>.
7. Public Safety Canada. North American plan for animal and pandemic influenza; 2012. [accessed April 25, 2020]. <https://www.publicsafety.gc.ca/cnt/rsrcs/pblctns/nml-pndmc-nflnz/index-en.aspx>.
8. Jacobsen KH. Will COVID-19 generate global preparedness? *Lancet*. 2020;395(10229):P1013-1014. Mar 18.
9. Andrea Remuzzi GR. COVID-19 and Italy: what next? *Lancet*. 2020;395(1):1225-1228.
10. World Health Organization. Coronavirus Disease 2019 (COVID-19) Situation Report—91. 2020.
11. Hale T, Webster S, Petherick A, Phillips T, Kira B. Oxford COVID-19 Government Response Tracker; 2020.
12. Yao H, Chen JH, Xu YF. Patients with mental health disorders in the COVID-19 epidemic. *Lancet Psychiatry*. 2020;7(4):9.
13. Holmes EA, O'Connor RC, Perry VH, et al. Multidisciplinary research priorities for the COVID-19 pandemic: a call for action for mental health science. *Lancet Psychiatry*. 2020 Apr 15 [Epub ahead of print]. doi: 10.1016/S2215-0366(20)30168-1.
14. Zhang J, Lu H, Zeng H, et al. The differential psychological distress of populations affected by the COVID-19 pandemic. *Brain Behav Immun*. 2020 Apr 15 [Epub ahead of print]. doi: 10.1016/j.bbi.2020.04.031.
15. Taylor S. The psychology of pandemics: preparing for the next global outbreak of infectious disease. Newcastle upon Tyne, UK: Cambridge Scholar Publishing; 2019.
16. Canadian Perspectives Survey Series 1: Impacts of COVID-19. Statistics Canada. 2020 Wednesday, Apr 8.
17. World Health Organization. Checklist for Influenza Preparedness Planning. Geneva, Switzerland: World Health Organization; 2005.
18. World Health Organization. WHO Outbreak Communication Planning Guide. Geneva, Switzerland: World Health Organization; 2008.
19. Shultz JM, Baingana F, Neria Y. The 2014 Ebola outbreak and mental health: current status and recommended response. *JAMA*. 2015;313(6):567-568.
20. Raphael B. The challenges of purpose in the face of chaos. *Int J Meth Psychiat Res*. 2008;17(S2):S42-S48.
21. Pan American Health Organization. Protecting mental health during epidemics. 2009; [accessed 2020 Apr 23]. <https://www.paho.org/en/documents/protecting-mental-health-during-epidemics>.
22. Brooks SK, Webster RK, Smith LE, et al. The psychological impact of quarantine and how to reduce it: rapid review of the evidence. *Lancet*. 2020;395(10227):P912-920.
23. Ontario and Quebec cannabis distributors see sales spike amid COVID-19 pandemic. *Global News*. 2020. Mar 16. [accessed

- April 25, 2020]. <https://globalnews.ca/news/6686754/cannabis-sales-coronavirus-pandemic/>.
24. Addiction CCoSUA. 25% of Canadians (aged 35-54) are drinking more while at home due to COVID-19 pandemic; 2020. [accessed April 25, 2020]. <https://www.ccsa.ca/covid-19-and-increased-alcohol-consumption-nanos-poll-summary-report>.
 25. Masten AS, Narayan AJ. Child development in the context of disaster, war, and terrorism: pathways of risk and resilience. *Annu Rev Psychol*. 2012;63(3):227-257.
 26. Lorenz L, APaAM. A socio-interpersonal approach to adjustment disorder: the example of involuntary job loss. *Euro J Psychotraum*. 2018;9(1):1425576.
 27. Kim TJ, von dem Knesebeck O. Perceived job insecurity, unemployment and depressive symptoms: a systematic review and meta-analysis of prospective observational studies. *Int Arch Occupat Environ Health*. 2016;89(4):561-573.
 28. Walker ER, Druss BG. Mental and addictive disorders and medical comorbidities. *Curr Psych Rep*. 2018;20(10):86.
 29. Seminog OO, Goldacre MJ. Risk of pneumonia and pneumococcal disease in people with severe mental illness: English record linkage studies. *Thorax*. 2013;68(2):171-176.
 30. Kim MJ. "It was a medical disaster": The psychiatric ward that saw 100 patients diagnosed with new coronavirus. *Independent*. 2020. [accessed April 25, 2020]. <https://www.independent.co.uk/news/world/asia/coronavirus-south-korea-outbreak-hospital-patients-lockdown-a9367486.html>.
 31. Zhu Y CL, Ji H, Xi M, Fang Y, Li Y. The risk and prevention of novel coronavirus pneumonia infections among inpatients in psychiatric hospitals. *Neurosci Bull*. 2020;36(3):299-302.
 32. Li W, Yang Y, Liu ZH, et al. Progression of mental health services during the COVID-19 outbreak in China. *Int J Biol Sci*. 2020;16(10):1732-1738.
 33. Xiang YT, Zhao YJ, Liu ZH, et al. The COVID-19 outbreak and psychiatric hospitals in China: managing challenges through mental health service reform. *Int J Biol Sci*. 2020;16(10):1741-1744.
 34. Kang YJ. Mortality rate of infection with COVID-19 in Korea from the perspective of underlying disease. *Disaster Med Public Health Prep*. 2020 Mar 31 [Epub ahead of print]. doi: 10.1017/dmp.2020.60. 1-3.
 35. Lai CC, Wang JH, Ko WC, et al. COVID-19 in long-term care facilities: an upcoming threat that cannot be ignored. *J Microbiol Immunol Infect*. 2020 Apr 13 [Epub ahead of print]. doi: 10.1016/j.jmii.2020.04.008. pii: S1684-1182(20)30102-X.
 36. Azpiri J. Vancouver sees spike in overdose deaths amid COVID-19 crisis. *Global News*. 2020. Apr 1. [accessed April 25, 2020]. <https://globalnews.ca/news/6763146/vancouver-sees-spike-in-overdose-deaths-amid-covid-19-crisis/>.
 37. Di Santtolo A. BBC Newsnight host stunned as expert warns THIRD of coronavirus cases among health workers. *Express*. 2020. Apr 17. [accessed April 25, 2020]. <https://www.express.co.uk/news/uk/1270173/BBC-Newsnight-coronavirus-infection-health-worker-latest-COVID-19-update-today-UK>.
 38. Lai J, Ma S, Wang Y, et al. Factors associated with mental health outcomes among health care workers exposed to coronavirus disease 2019. *JAMA Netw Open*. 2020;3(3):e203976.
 39. Huang Y, Zhao N. Generalized anxiety disorder, depressive symptoms and sleep quality during COVID-19 outbreak in China: a web-based cross-sectional survey. *Psychiatry Res*. 2020 Apr 12 [Epub ahead of print]. doi: 10.1016/j.psychres.2020.112954.
 40. Kang L, Ma S, Chen M, et al. Impact on mental health and perceptions of psychological care among medical and nursing staff in Wuhan during the 2019 novel coronavirus disease outbreak: a cross-sectional study. *Brain Behav Immun*. 2020 Mar 30 [Epub ahead of print]. doi: 10.1016/j.bbi.2020.03.028. pii: S0889-1591(20)30348-2.
 41. Troyer EA, Kohn JN, Hong S. Are we facing a crashing wave of neuropsychiatric sequelae of COVID-19? neuropsychiatric symptoms and potential immunologic mechanisms. *Brain Behav Immun*. 2020 Apr 13 [Epub ahead of print]. doi: 10.1016/j.bbi.2020.04.027.
 42. Bartone PT, Krueger GP, Bartone JV. Individual differences in adaptability to isolated, confined, and extreme environments. *Aerosp Med Hum Perform*. 2018;89(6):536-546.
 43. Manjunatha N MS, Kulkarni GB, Chaturvedi SK. The neuropsychiatric aspects of influenza/swine flu: a selective review. *Indust Psych J*. 2011;20(2):83-90.
 44. Galatzer-Levy I, Huang SH, Bonanno GA. Trajectories of resilience and dysfunction following potential trauma: a review and statistical evaluation. *Clin Psychol Rev*. 2018; 63:41-55.
 45. Qiu JEA. A nationwide survey of psychological distress among Chinese people in the COVID-19 epidemic: implications and policy recommendations. *General Psychiatry*. 2020;33(1): e100213.
 46. Hong X, Currier GW, Xiaohui Z., Jiang Y, Zhou W, Wei J. Posttraumatic stress disorder in convalescent severe acute respiratory syndrome patients: a 4-year follow-up study. *Gen Hosp Psychiatry*. 2009;31(3):546-554.
 47. Gratzler D, Goldbloom D. Open for business: chatbots, e-therapies, and the future of psychiatry. *Can J Psychiatry*. 2019;64(7):453-455.
 48. Vaidyam AN, Wisniewski H, Halamka JD, Kashavan MS, Torous JB. Chatbots and conversational agents in mental health: a review of the psychiatric landscape. *Can J Psychiatry*. 2019;64(7):456-464.
 49. Andersson G, Carlbring P, Titov N, Lindfors N. Internet interventions for adults with anxiety and mood disorders: a narrative umbrella review of recent meta-analyses. *Can J Psychiatry*. 2019;64(7):465-470.
 50. Ott H. 750,000 volunteers answer call to help U.K. health service manage coronavirus crisis. *CBS News*. 2020. Mar 31. [accessed April 25, 2020]. <https://www.cbsnews.com/news/750000-volunteers-answer-call-to-help-u-k-health-service-manage-coronavirus-crisis/>.
 51. Partners in Health and Government of Massachusetts. Community tracing collaborative. 2020. [accessed April 25, 2020]. <https://www.pih.org/ma-response>.
 52. World Health Organization. Mental Health Action Plan 2013-2020. Geneva, Switzerland: WHO; 2013.