Mental Health During the First Year of the COVID-19 Pandemic: A Review and Recommendations for Moving Forward

The Lancet's COVID-19 Commission Mental Health Task Force

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Abstract

COVID-19 has infected millions of people and upended the lives of most humans on the planet. Researchers from across the psychological sciences have sought to document and investigate the impact of COVID-19 in myriad ways, causing an explosion of research that is broad in scope, varied in methods, and challenging to consolidate. Because policy and practice aimed at helping people live healthier and happier lives requires insight from robust patterns of evidence, this paper provides a rapid and thorough summary of high-quality studies available through early 2021 examining the mental health consequences of living through the COVID-19 pandemic. Our review of the evidence indicates that anxiety, depression, and distress increased in the early months of the pandemic. Meanwhile, suicide rates, life satisfaction, and loneliness remained largely stable throughout the first year of the pandemic. In response to these insights, we present seven recommendations (one urgent, two short-term, and four ongoing) to support mental health during the pandemic and beyond.

Keywords: COVID-19, mental health, psychological distress, subjective well-being, loneliness, social connection, self-harm, suicide

The novel coronavirus (SARS-CoV-2) has infected millions of people and altered the lives of nearly every human on the planet. Although early fears focused on respiratory failure from contracting the virus, a fast-growing body of research points to the possibility that COVID-19 has a farther-reaching impact than originally recognized. Specifically, during the first year of the pandemic, most of the world's population lived with the uncertainty of contracting the virus and with disruptions to daily life due to public health measures implemented to slow the spread of COVID-19, which may have imposed psychological challenges. What are the mental health consequences of living through a pandemic? What can individuals, organizations, and governments do to support mental health during this extraordinary time and beyond?

To help answer these questions, *The Lancet* assembled a COVID-19 Commission to use evidence-based insights to understand the scope of the current pandemic and its consequences. The Commission aims to "help speed up global, equitable, and lasting solutions to the pandemic" (Sachs, et al., 2020). Part of this effort is captured in this report by the current authors who represent *The Lancet'*s COVID-19 Commission Mental Health Task Force. Our aim is to summarize findings, delineate high-priority open questions, and offer recommendations for both individuals and organizations to support mental health during the current pandemic. We focus on mental health because it is a critical, consequential, and under-supported facet of overall well-being (Chisholm et al., 2016; Layard, 2013; Layard & Clark, 2015; Patel et al., 2018; WHO, 1946). Indeed, mental illnesses impact between one third and one half of the working age population in some countries, while only a small fraction of the population (~5%) receives access to evidence-based treatments that offer a favorable chance of recovery (Clark et al., 2018). Moreover, mental health holds personal, economic, and societal relevance given its greater impact on human activity than any other non-communicable illness (Knapp & Wong,

2020) and association with higher rates of mortality (e.g., Chida & Steptoe, 2009; Howell, Kern & Lyubomirsky, 2007; Keyes & Simoes, 2012; cf. Singer, Garfinkel, Martin & Srole, 1976).

This report contains two sections. In Section 1, we review the mental health correlates of living through the pandemic using evidence collected through April 2021. In Section 2, we offer seven recommendations (one urgent, two short-term, and four ongoing) and early insights to manage mental health during COVID-19 to *build back better.* Foreshadowing these recommendations, we call for urgent large-scale research into the nature, treatment, and long-term mental health consequences of living through the pandemic (*recommendation #1*). In the short-term, we recommend more systematic monitoring of mental health for possible and confirmed patients as well as for people with higher exposure or burdens of care (*recommendation #2*), and the prioritization of safe access to childcare and elementary schools (*recommendation #3*). For the longer term, we encourage greater investment in mental health services so that research-based treatment for mental health is as widely available as physical health treatment (*recommendation #4*), making online mental health therapy widely available and supplemented with in-person support (*recommendation #5*), promoting widespread subjective well-being efforts at work, schools, and in communities (*recommendation #6*), as well as embedding mental health care and promotion within all social care systems (*recommendation #7*).

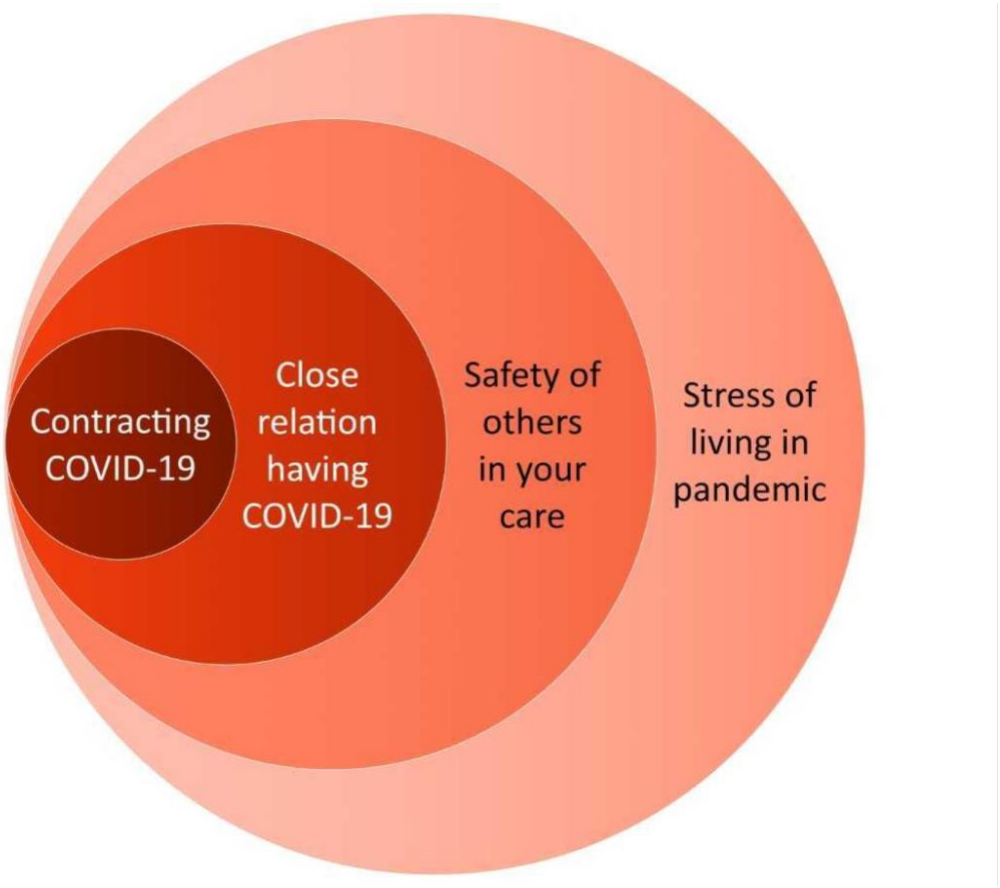
Before presenting the evidence, two limitations merit discussion. First, research on COVID-19 and its sequelae is evolving fast. A majority of the evidence reviewed here was collected during the early months of the pandemic. Because the prevalence of the virus and public health response patterns are in flux, the full picture is still unfolding. In an effort to present the most current and robust information, we focus on well-powered, representative, or

weighted samples using rigorous methodologies (e.g., pre-registration or well-matched control groups), including pre-prints that are currently undergoing peer review. We prioritized data with one or more of these qualities because such evidence is more likely to provide the most useful insights through robust estimates, generalizable conclusions, and non-spurious information. Second, much of the large-scale data available to date catalogues the impact of COVID-19 in relatively Western, Educated, Industrialized, Rich, and Democratic (WEIRD) nations (Henrich, Heine, & Norenzayan, 2010). For this reason, we are cautious about extrapolation to other nations and cultural contexts. More longitudinal and representative research is needed. However, we feel that several critical lessons have already emerged.

What are the mental health consequences of living through the pandemic?

Nearly everyone on the planet has been living through the pandemic and the public health measures issued in response, which has imposed various stressors on individuals (see Figure 1). How has the first year of the pandemic and the wide array of response actions impacted mental health? To answer this question, we first introduce mental health as a broad, complex, and multi-faceted construct that we consider through the lens of four key outcomes defined below. These outcomes were chosen through a bottom-up selection process in which our multi-disciplinary team of experts surveyed the literature for high-quality research in Fall 2020 and Spring 2021. The task force members then met to discuss and evaluate the evidence, and we identified four outcomes that had been studied sufficiently to enable initial conclusions: psychological distress, self-harm, subjective well-being, and loneliness. These outcomes represent topics that have been widely assessed and discussed during the pandemic (e.g., American Psychological Association, 2020; Miller, 2020).

Figure 1. Each circle represents a layer of potential stress during the COVID-19 pandemic that may accumulate to undermine mental health.



Defining our Constructs of Interest

Psychological distress captures a range of psychological states, including anxiety, depression, distress, and more (Kotov et al., 2017). While many people experience low to moderate levels of these states in daily life, high levels can cause mental illness in which a person experiences severe and chronic disturbance to daily function and may be diagnosed and treated clinically by a mental health professional (VandenBos, 2013). Here we focus on several representative constructs--mainly anxiety, depression, and distress--that have been measured in large samples with validated self-report screening and diagnostic tools, such as the Patient Health

Questionnaire (Kroenke et al., 2001) to assess depression. Many of these instruments allow researchers to compute a total score that can be compared to standard cut-offs to identify acute or severe levels.

Self-harming behaviour is defined here as the deliberate, direct destruction or alteration of body tissue that results in damage (Gratz et al., 2001). We also consider suicidal ideation and suicide attempts. While self-harming behaviour is not considered a component of mental health, it is a maladaptive method of coping with overwhelming negative emotions that have harmful physical consequences and can interfere with interpersonal relationships and therapy (Favazza, 1989). Self-harm is typically measured using self-report tools, including the Patient Health Questionnaire-9 (Kroenke et al., 2001), which asks participants about the frequency that they have been "self-harming or deliberately hurting" themselves or have experienced "thoughts that you would be better off dead" in the previous week.

Subjective well-being is defined here as the extent to which someone reports experiencing a preponderance of positive affect or emotion and infrequent negative affect or emotion, as well as a positive evaluation of their life (Diener, 1984). Because positive and negative emotions tend to be relatively malleable and respond to changes in one's immediate environment, emotions are typically assessed by asking people to indicate the frequency or extent to which they have recently felt positive states (e.g., happy, joyful, calm) and negative states (e.g., worried, sad, bored). In contrast, life satisfaction ratings ask respondents to provide a global assessment of their life as a whole or its facets (e.g., satisfaction with work or family life). For instance, one tool commonly used to measure life evaluations is the Cantril ladder (Cantril, 1965), which prompts respondents to rate their life on a ladder-like scale ranging from 0 at the bottom, reflecting the worst possible life, to 10 at the top, indicating the best possible life (Helliwell,

Huang & Wang, 2019). As this measure suggests, life evaluations tend to be more cognitive in nature (Diener, Oishi, & Lucas, 2003), and although such ratings may be informed by one's current or recent emotions, life satisfaction tends to be more stable than emotion ratings. Notably, in this report, we focus on a variety of subjective well-being measures, as opposed to objective well-being indicators.

Loneliness is a psychological state that is associated with deficiencies in a person's social relationships. Although loneliness is not a facet of mental health per se, a wealth of research indicates that loneliness is a key predictor of mental health challenges, such as distress (Luchetti et al., 2020; Perlman & Peplau, 1984). Importantly, mental health difficulties arise from the perceived discrepancy between one's desired and actual social relationship quality, rather than merely being physically isolated (Holt-Lunstad et al., 2017). Loneliness is often assessed using self-report measures, such as the UCLA Loneliness Scale (Lee & Cagle, 2017), which captures individuals' overall loneliness, as well as their feelings of isolation and the availability of social connections. In our review, we also assess the opposite of loneliness--social connection--captured on measures like the Social Connectedness Scale (Lee et al., 2001), which focuses more on one's degree of connection with others and less on feelings of isolation.

With these definitions in mind, how have mental health and these related constructs changed during COVID-19? Below we review the most informative data available to date to focus on three overarching questions: First, have average levels of psychological distress, self-harm, subjective well-being, and loneliness changed from pre-pandemic to during the pandemic? Second, what factors predict greater risk or protection in psychological distress, self-harm, subjective well-being, and loneliness during the pandemic onset and early months? Third, considering data collected after COVID-19 started, what are the correlates of better and worse

mental health during the pandemic? Taken together, these questions offer a broad and useful summary of the fast-emerging literature on COVID-19 and mental health.

Have average levels of psychological distress, self-harm, subjective well-being, and loneliness changed from pre-pandemic to during the pandemic?

Headline: A clear and consistent body of evidence suggests that psychological distress increased during the early months of the COVID-19 pandemic and that most (but not all) facets returned to pre-pandemic levels by mid-2020. While some components of subjective well-being showed signs of strain (e.g., increasing negative emotions), the data also reveal notable signs of resilience in life satisfaction, loneliness, social connection, and suicide.

To examine whether and how the COVID-19 pandemic has impacted various facets and correlates of mental health, we draw upon two types of evidence that offer unique strengths and insights: repeated cross-sectional data and longitudinal data. Repeated cross-sectional surveys compare responses from two or more datasets that are matched on key sample characteristics to examine whether and how average levels of mental health outcomes have shifted over time. In contrast, longitudinal survey data assesses responses from the same individuals over time, such as before and during the early months of the COVID-19 pandemic.

Considering repeated cross-sectional and longitudinal surveys in tandem is particularly informative because the two methodologies have many non-overlapping strengths and weaknesses. For instance, because longitudinal surveys track the same people over time, this strategy minimizes concerns that different types of people were recruited for each survey, and that individual differences (e.g., personality) might obscure relationships in the data. Meanwhile, repeated cross-sectional data minimizes worries that respondents who drop out of the study

systematically differ from those who remain (i.e. selective retention), because each survey recruits a new but well-balanced sample. While neither of these methodologies can confirm causality, consistent patterns observed across both types of evidence enable researchers to draw more convincing conclusions.

Psychological distress

Repeated cross-sectional data. Numerous cross-sectional surveys suggest that the pandemic and its aftermath have taken a toll on various facets of psychological distress. For instance, within the United States, a comparison of two relatively large nationally representative surveys conducted before (2017-2018; *n* = 1,441) and early during the COVID-19 outbreak (March – April 2020; *n* = 5,065) shows a three-fold increase in depression symptoms on the Patient Health Questionnaire (Ettman et al., 2020). Similarly, a nationally representative survey (*n* = 1,468) reported that 13.6% of American adults indicated symptoms consistent with severe psychological distress in April 2020, an estimate nearly four times greater than was observed in a separate nationally representative sample of Americans in 2018 (3.9%, *n* = 25,417; McGinty et al., 2020). Data from a nationally representative survey (*n* = 1,982) in the UK conducted in April 2020 also depicted significantly higher levels of anxiety than previous estimates from a similar, matched sample collected by the Office of National Statistics (ONS) in March – April 2019 (Fujiwara & Campbell, 2011; Fujiwara et al., 2020). A sample drawn primarily at random from adults in Norway (*n* = 10,061) between late March and early April 2020 showed an approximate three-fold increase in the number of people surpassing the depression cut-off score of 10 on the PHQ-9 (30.78%) during the pandemic as compared to a representative and random sample (10.24%; *n* = 1,944) drawn in 2015 (Ebrahimi et al., 2021). The same data set also suggests that the number of people surpassing the anxiety cut-off score of 8 on the GAD-7 was approximately

twice as high during the pandemic (27.57%) as compared to pre-pandemic estimates from nearby nations, such as Sweden (14.70%; *n* = 3,001; Johansson et al., 2013).

Longitudinal data. Consistent with the cross-sectional data reported above, Pierce and colleagues (2020) find evidence of increased psychological distress during COVID-19. Using data from the UK Household Longitudinal Survey, which includes responses from over 50,000 residents across England, Wales, Scotland, and Northern Ireland, the authors looked for changes in psychological distress on the General Health Questionnaire captured during COVID-19 (April 2020) to those collected before. Pierce and colleagues (2020) report that the prevalence of clinically significant distress (i.e., the proportion of people surpassing clinical thresholds) rose from 18.9% in 2018-2019 to 27.3% in late April 2020 during lockdown among the full sample. In addition, the sample reported higher mean levels of psychological distress on the GHQ (an overall increase in scores from 11.5 to 12.6) during the same timeframe, a gap that is nearly half a point larger than would be expected given the upward trend in psychological distress observed over the past few years (Pierce et al., 2020; see also Banks & Xu, 2020; Proto & Quintana-Domaque, 2021).

Over time, mean levels of psychological distress may have declined from an early peak after the COVID-19 outbreak. Supporting this possibility, longitudinal data from a nationally representative sample of 7,319 Americans in an 8-wave survey conducted over March – July 2020 reveals a significant increase in psychological distress between March – April but a return to pre-pandemic levels by June 2020 (Daly & Robinson, 2021). Similarly, responses from a large panel survey in the UK ($n > 70,000$) reveal that depression and anxiety, which were very high in March 2020, decreased precipitously in the first few weeks of lockdown and then plateaued (Fancourt, Steptoe & Bu, 2020). These findings align with those of Fetzer and colleagues (2020),

who report that a nationwide lockdown in the UK was associated with lower levels of depression and worry in a large online sample (*n* = 108,075) collected in March/April 2020. A similar conclusion comes from a meta-analysis of 65 longitudinal cohort studies published between January 2020 to January 2021 (*n* = ~55,000 participants) tracking psychological distress from before to during the pandemic. The meta-analysis reports a significant increase in both anxiety and depression during March – April 2020 but then a decline to near pre-pandemic levels on most measures except depression by mid-2020 (Robinson et al., 2021). Consistent with this summary, the most recent analysis of the Opinions and Life Survey collected from a population-weighted cross-sectional sample of nearly 26,000 adults in Britain suggests that depression was still elevated in early 2021. Specifically, between late January and early March 2021, approximately 21% of the population reported a score of 10 or higher on the PHQ-8, which is more than double the pre-pandemic estimate of 10% captured between July 2019 to March 2020 (ONS, 2021).

As another approach to examining distress, researchers compiled patient records from over 14 million individuals in the UK. They found that mental illness rates were lower in April 2020 than expected based on past trends, but largely returned to expected levels by September 2020 (Carr et al., 2020). These initial declines may have been a result of reductions in primary care visits and fewer new diagnoses due to limitations caused by the COVID-19 pandemic. Thus, these data suggest an increase in unmet needs that could trigger a later influx in mental health care (Carr et al., 2020).

Self-harm

Repeated cross-sectional data. During the early months of the pandemic, thoughts of self-harm and suicide increased in the UK, but not in Norway. Data from a population weighted

sample of 44,775 adults in the UK contacted between late March and late April 2020 indicate that 18% of respondents had thoughts about suicide or self-harm (Iob, Steptoe, & Fancourt, 2020). This estimate is higher than one captured in a previous survey by the UK Office of National Statistics (2016), which estimated that 5.4% of the adult population 16 years and older from England, Scotland, and Wales had reported suicidal thoughts in the past year. However, responses to a diagnostic psychiatric interview completed by four waves of probability-based samples in Norway (n = 2,154) through January to September 2020 shows no change in suicidal ideation over time (Knudsen et, 2021).

Longitudinal. A large-scale longitudinal dataset indicates little change or an initial decline in self-harming behaviour during early months of the COVID-19 pandemic. Researchers analyzing over 14 million patient records in the UK also referenced above found that self-harm rates were lower than expected in April 2020 and reverted to expected levels in many areas by September 2020 (Carr et al., 2020). Once again, however, lower levels of self-harm ratings may result from lower levels of detection and primary care visits during the COVID-19 pandemic. As such, it is possible that earlier unmet needs may require greater care in the future (e.g., Carr et al., 2020).

Critically, several sources demonstrate little change in suicide during the early months of the pandemic. Google trends spanning January 2019 to April 2020 show decreases in searches referring to suicide in Western European Countries and the United States (Brodeur et al., 2021). Real-time data from police reports in Queensland, Australia show that suicide rates did not increase during the first 7 months of the COVID-19 pandemic as compared to averages from 5 years prior (Leske et al., 2020). Researchers found no evidence for an increase in suicides when comparing the number of suicides identified in the Norwegian Cause of Death Registry from

March – May 2014-2018 to March – May 2020 (Knudsen et al., 2021). Finally, researchers analyzing real-time suicide data from official government sources in 21 countries (16 high income and 5 middle income) using interrupted time series analyses found no evidence of increased suicide from April 1 – July 30, 2020 when comparing observed to expected rates (Pirkis et al., 2021). Indeed, suicide rates were significantly *lower* than model expectations in some countries and regions (e.g., Chile, Ecuador, Japan, USA) during this timeframe. This pattern of results remained largely unchanged when including data up to October 31, 2020 where available, but two places did show a significant increase in the month of October, 2020 (Japan and Puerto Rico; Pirkis et al., 2021).

Subjective well-being

Repeated cross-sectional data. Evidence suggests that people have experienced more unpleasant emotions during the pandemic. For example, comparing responses from approximately 1,000 people drawn from each of 95 countries surveyed by the Gallup World Poll from March through December 2020 to average responses from 2017 – 2019 showed small but statistically significant increases in the frequency of negative emotions (rising from 27% to 29%), although there was no change in the frequency of positive emotions (Helliwell et al., 2021). Similarly, in April 2020, a nationally representative sample from the UK (n = 1,982) reported lower levels of daily happiness than reported by a previous sample in March – April 2019 (Fujiwara et al, 2020). Fao and colleagues (2020) analyzed responses from repeated cross-sectional panels collected by YouGov from June 2019 – June 2020, consisting of ~2,000 people per week (n = 99,719), representative in age, gender, social class, and education of the UK. These data revealed a sharp increase in negative affect and decrease in positive affect during the spring of 2020, with a partial return to typical levels by May 2020. A similar pattern emerged in

data from the UK Understanding Society survey (University of Essex Institute for Social and Economic Research, 2020). Finally, a comparison of two separate nationally representative samples of Americans surveyed in January (n = 1,010) and June 2020 (n = 3,020) suggests that people's feelings of happiness declined by almost one point on an 11-point scale (VanderWeele et al., 2020).

While emotional measures of happiness exhibited declines during the early phase of the pandemic, life-satisfaction (the cognitive-evaluative component of subjective well-being) remained largely unchanged in many countries. For example, data from the Eurobarometer, which sampled over 30,000 people in 34 countries before (September – December 2019) and during COVID-19 (July – August 2020), show very small changes, with more being positive than negative. In the Gallup World Poll data (referred to above), life satisfaction exhibited a slight but non-significant *increase* from the pooled 2017-2019 averages compared to the corresponding 2020 data (Helliwell et al., 2021). However, life satisfaction appears to have declined in some countries. In Canada, life satisfaction dropped by 1.38 points on a zero to ten response scale, from 8.09 in 2018 (n > 49,200) to 6.71 in June 2020 (n ~ 4,200), as measured in two nationally representative surveys (Helliwell, Schellenberg & Fonberg, 2020). Similarly, nationally representative samples exhibited reduced life satisfaction in the United States (VanderWeele et al., 2020) and the UK (Fujiwara et al, 2020). The finding that so many other countries exhibited striking resilience requires further analysis. One explanation is that life evaluations invite people to compare their life to the lives of others. In doing so, people may feel that their life may be worse now than before in some respects, while on balance being much better than it might have been.

Longitudinal data. Few longitudinal studies capture subjective well-being before and after COVID-19 but these studies depict a high degree of resilience. One dataset included an assessment of positive and negative emotions among a probability sample of 779 individuals in France before (2017, 2018) and during COVID-19 (early April 2020, mid-April 2020, and late April/early May 2020). Overall, the data revealed an *increase* in emotional well-being over time, from before COVID-19 (mean of .64 in 2019) to during the pandemic (mean of .69 in May 2020; Recchi et al., 2020; see also http://www.cepremap.fr/Tableau_de_Bord_Bien-Etre.html). Data from the German Socio-Economic Panel (SOEP), which includes a longitudinal sample of about 25,000 respondents in 15,000 households annually, showed that overall life satisfaction remained unchanged from 2019 to April 2020 (Liebig, 2020).

Looking beyond self-report scales, social media posts and internet searches can provide some additional insight into subjective well-being trends. Sentiment analysis of 17,865 active users of Weibo, China's most popular social media platform, spanning a two-week period from January 13 to 26, 2020 (with the COVID-19 outbreak declared on January 20) reveals a small but significant increase in negative emotion, depression, and indignation alongside decreases in positive emotion, including happiness and life satisfaction (Li et al., 2020). Meanwhile, Google searches for contentment, sadness, and irritability did not change from January 2019 to April 2020 in Western Europe and increased in the United States, but well-being searches over this same period declined in Western Europe and increased in the United States (Brodeur et al., 2021).

Loneliness and social connection

Repeated cross-sectional data. Evidence concerning loneliness and social connection depicts some evidence of resilience as well. Despite early speculation and fear that physical

distancing would unleash a second epidemic of loneliness, repeated cross-sectional studies have found little evidence of substantial change. For instance, responses to the weekly representative UK cross-sectional panel collected by YouGov described above from June 2019 – June 2020 (*n* = 99,719) suggests that the percentage of people reporting feeling lonely in the week prior to reporting peaked during the first month of lockdown from late March to April 2020, but rates began to decline in May and were within 2% of pre-pandemic levels at ~16% by June 2020 (~18%; Fao et al., 2021). Similarly, McGinty and colleagues (2020) examined data from a nationally representative sample of 1,468 Americans in April 2020 and found that 13.8% reported feeling that they were often or always lonely. This percentage is only slightly (albeit significantly) higher than the 11% reported in a separate sample in April and May 2018 (Kaiser Family Foundation, 2018). As a result, the authors suggest that loneliness is unlikely to be the primary source of distress during the COVID-19 pandemic.

Longitudinal data. Consistent with the repeated cross-sectional data reported above, longitudinal data flanking the pandemic show relatively little overall change in social connection and loneliness. For instance, responses from a nationwide sample of 1,545 Americans surveyed in late January/early February, March, and April 2020 exhibited no mean-level change in loneliness and reported a significant *increase* in perceptions of social support, although people with higher levels of loneliness at baseline were more likely to drop out of the study (Luchetti et al., 2020). Google search trend data align with these findings. Queries for loneliness did not increase significantly between January 2019 – April 2020 in the United States, but did increase significantly during the first few weeks of lockdown in Western Europe before returning to baseline (Brodeur et al., 20201). In a pre-registered, longitudinal study, Folk and colleagues (2020) found relatively little change in social connection before and during the pandemic among

students in Canada (*n* = 467) and adults primarily in the US and UK (*n* = 336). As the authors (2020) note, this resilience aligns with the idea of *substitution*, wherein people find creative ways to fulfill their fundamental need to belong when familiar channels are blocked (Baumeister & Leary, 1995). Finally, a longitudinal dataset including responses from 10,740 Norwegians contacted before the COVID-19 pandemic (in either October 2019 or Feb 2020) and again during the pandemic in June 2020 showed that overall loneliness remained stable or declined (Hansen et al., 2021).

Data collected after COVID-19's onset are consistent with the idea that loneliness has remained largely stable. A large (*n* = 35,712) longitudinal dataset in the UK showed no mean-level change in loneliness over late March to early May 2020, though individuals with the highest levels of loneliness at baseline did become more lonely overtime (Bu, Steptoe & Fancourt, 2020). Similarly, an online sample of 500 Americans surveyed in late March and early April 2020 revealed that individuals who perceived the greatest impact of COVID-19 were most likely to report *lower* levels of loneliness and the *highest* levels of social support (Tull et al., 2020). Thus, the physical distancing requirements of the COVID-19 pandemic may have encouraged many people to find new, creative forms of social connection. However, it is worth acknowledging that these studies examining social connection and loneliness during COVID-19 used online recruitment and survey tools, which required participants to possess at least a basic level of digital literacy to respond. As such, this group of respondents may have had higher social connection ratings because they were likely better able to remain connected to friends and family online compared to individuals who struggled with digital literacy and access to digital technologies.

What factors predict greater risk or protection in psychological distress, self-harm, subjective well-being, and loneliness during the pandemic onset and progression?

Headline: Many pre-existing inequalities in psychological distress remain. The pandemic has also introduced new profiles of risk, with younger individuals, females, and those with children under the age of 5 years showing the largest increase in psychological distress.

Appreciating the large-scale and far-reaching influence of COVID-19 on mental health is valuable, but mean-level changes can mask significant variation in who has been impacted the most. Below, we consider how COVID-19 may have impacted psychological distress, self-harm, subjective well-being, and loneliness/social connection above and beyond pre-existing discrepancies in mental health.

To do so, we consider longitudinal datasets that assessed psychological distress, self-harm, subjective well-being, and loneliness/social connection in the same individuals before and during the early months of COVID-19. These data provide insight into whether and how various factors (e.g., personality, socio-economic status, relationship status, mental health history, family composition) predicted changes in mental health and related constructs as the pandemic substantially altered daily life. Notably, these data offer researchers the opportunity to examine whether some predictors remained the same, and if new predictors have emerged.

Psychological distress

Some of the most rigorous evidence collected to date reveals that many of the pre-existing risk factors for psychological distress have persisted during the COVID-19 pandemic, and several new profiles of risk have emerged. As noted above, Pierce and colleagues (2020) used longitudinal data from before and during the early months of COVID-19 (April 2020) from more than 50,000 individuals in the UK to assess mental health changes. While the data revealed

an increase in psychological distress, analyses also show that several previously documented predictors of psychological distress remain during the pandemic. Specifically, individuals who self-identify into the following categories report higher psychological distress under COVID-19: female (vs. males), member of a minority or marginalized racial group (e.g., Asian vs. White British), living in urban (vs. rural) areas, those in the lowest income quintile (vs. other income quintiles), unemployed or inactive (vs. employed), living without a partner (vs. living with a partner), or having pre-existing health risks (vs. not) (Pierce et al, 2020). Notably, many of these factors were robust predictors of psychological distress before the pandemic, indicating that pre-existing mental health divides remain under COVID-19.

Critically, individuals in some groups have suffered more during the pandemic than before, introducing new profiles of risk. Within-individual analyses controlling for time trends and other sources of change suggest that COVID-19 led to the greatest increases in psychological distress for individuals who identify as female, are in younger age categories (18-24 and 25-34), and have young children (< 5 years of age) at home (Pierce et al, 2020). These findings are consistent with those of Banks and Xu (2020) who analyze responses from 11,988 individuals in the same dataset (UK Household Longitudinal Survey) and report the greatest declines in mental health among young females (see also Proto and Quintana-Domaque, 2021).

Pierce and colleagues (2020) also indicate that individuals who were employed or retired before the pandemic reported higher than expected levels of psychological distress in April 2020, as did individuals in the lowest and highest income brackets. This latter finding is somewhat surprising given that longitudinal responses from 12,527 adults in the UK collected between late March to mid-April 2020 show that COVID-19 adversities have disproportionately impacted people in lower socio-economic groups (Wright, Steptoe & Fancourt, 2020). However, most of

these findings align with other data indicating that individuals who are younger (ICL/YouGov Tracker; Varma et al., 2020), female (Fancourt et al., 2020), and experiencing financial strain (Varma et al., 2020) report higher psychological distress during the pandemic. As such, the pandemic has maintained the impact of some (but not all) risk factors for psychological distress and introduced new risk profiles as well (e.g., those who are young, female, and with young children at home).

Self-harm

Several large-scale datasets now suggest that suicide rates have not increased above predicted rates during the first several months if the pandemic (e.g., Pirkis et al., 2021). However, we are only aware of one paper examining how suicide patterns have changed for various demographic and occupational groups over time using data from Japan (Ueda et al., 2020). These data note an initial decline in suicides in April-May 2020, but a rise in July 2020 and afterward. The authors examined changes in suicide rates by gender, age, and occupation status and observed the largest changes among females under the age of 40. For instance, in October 2020, suicides were nearly 96% higher among young women than the average number of suicides seen across October 2017-2019 for this group. Suicides were also higher among students and homemakers in 2020 than in 2017-2019. Thus, these data dovetail with those reported in the psychological distress section above in that they suggest that some of the increases have been most extreme among young females.

Subjective well-being

As reported above, a longitudinal data set of 779 people in France found an overall increase in emotional well-being from before to during (May 2020) the pandemic (Recchi et al., 2020; see also http://www.cepremap.fr/Tableau_de_Bord_Bien-Etre.html). These changes

appear to be similar across most sub-groups of the population. Indeed, while individuals in the lowest income bracket reported significantly lower levels of subjective well-being than individuals in middle- and high-income brackets before the pandemic (Kahneman et al., 2006; Reyes-Garcia et al., 2016; Howell et al., 2006), the pandemic did not alter this pattern. Subjective well-being gains appear to be relatively uniform for individuals across the income spectrum and with different occupations (Recchi et al., 2020). The authors propose that such similar increases in subjective well-being reported in this sample may be due to France's generous unemployment benefits paid to full-time employees during the pandemic (Recchi et al., 2020). This possibility is consistent with an analysis of past quarantine measures and their impact on subjective well-being wherein various forms of governmental aid offered useful support during a challenging time (Brooks et al., 2020).

Loneliness and social connection

As noted above, longitudinal data flanking the start of the pandemic show relatively little overall change in loneliness and social connection. The researchers examining responses from a nationwide sample of 1,545 Americans surveyed in late January/early February, March, and April 2020 collected information on respondents' age, health status, and living arrangements (alone vs. two or more people in a household). At baseline, people in younger age categories, living alone, and those experiencing one or more chronic health concerns reported greater loneliness. Notably, however, only age predicted greater *changes* in loneliness during COVID-19 onset, such that older adults reported greater increases in loneliness between late January/early February and March. Loneliness changes across age groups were similar between March and April. Furthermore, the data suggest that COVID-19 did not differentially impact loneliness for individuals with varying health statuses nor various living arrangements (Luchetti et al., 2020).

Other data align with the general pattern of stability in loneliness and offer some insight into protective factors. As noted above, data collected by Hansen and colleagues (2021) found no overall change in loneliness among a longitudinal sample of 10,740 Norwegian adults contacted several months before (October 2019 or February 2020) and during the COVID-19 pandemic (June 2020). However, subsequent analyses revealed that having a romantic partner, being younger in age (<65 years, among women), as well as having lower social support and higher psychological distress predicted greater decreases in loneliness over time. The potential importance of living with a partner has been observed in other longitudinal samples utilizing pre-registered analysis plans (e.g., Okabe-Miyamoto et al., 2021), suggesting that living with a romantic partner during this challenging time may offer unique benefits.

Looking at data collected after COVID-19 started, what experiences and behaviours are associated with higher or lower psychological distress, self-harm, subjective well-being, and loneliness during the pandemic?

Headline: Being near or experiencing COVID-19 infection, struggling with financial uncertainty introduced by COVID-19, and spending more time homeschooling, engaged in chores, or reading COVID-19 news has been associated with more psychological distress and worse subjective well-being.

Data collected in the wake of COVID-19 sheds light on several factors associated with psychological distress, self-harm, subjective well-being, and loneliness during the pandemic. For simplicity and brevity, we discuss findings on our four key outcomes (psychological distress, self-harm, subjective well-being, and loneliness/social connection) under broad category headings here. A more detailed list of study details can be found in Table 2.

Personal experience with or proximity to illness

Believing that you or a close other has contracted COVID-19 is associated with psychological distress and self-harm. Examining data from 44,775 people surveyed between late March to late April in the UK, Iob and colleagues (2020) found that individuals who had received a diagnosis of COVID-19 reported higher levels of self-harm and suicidal thoughts than those who had not. Even those without confirmation of the virus reported mental health costs. For instance, in a sample of 69,054 quarantined college students in France surveyed between April-May 2020, students reported greater distress if they experienced symptoms consistent with COVID-19 (Wathalet et al., 2020), suggesting that simply worrying that one has the virus may lead to psychological distress (see Figure 1). However, the correlational nature of these data allows for the possibility that individuals with greater mental concerns may be more likely to be hypervigilant and distressed by virus symptoms. Beyond personal risk, concern about close others contracting COVID-19 is also associated with psychological distress (see Figure 1). For instance, in a sample of 7,143 college students surveyed in China in January or February 2020, people who reported that their friends or family had been infected reported higher anxiety (Cao et al., 2020; see also Li et al., 2020; Wathalet et al., 2020).

Along similar lines, health care workers who treat numerous patients with COVID-19 and see the fatally ill in large numbers may also report greater psychological distress (Gruber et al., 2020; Vigo et al., 2020; Figure 1). Providing some support for this possibility, data from the UK Household Longitudinal Survey (n > 50,000) collected in April 2020 reveal that healthcare workers were more likely to report psychological distress scores surpassing clinical thresholds than non-healthcare workers, but mean-level rates did not differ from those working outside the healthcare industry and did not increase significantly more than those of non-health care workers

during the early months of COVID-19 (Pierce et al., 2020; see also Frank et al., 2020). Longitudinal data collected from 1,056 adults in Spain in March 2020 and April/May 2020 show that healthcare workers reported higher anxiety scores than non-healthcare workers at the early peak of deaths (Planchuelo-Gomez et al., 2020). Responses from this same sample also indicate that anxiety dropped significantly among healthcare workers (vs. non-healthcare workers) one month later when the number of deaths decreased (Planchuelo-Gomez et al., 2020). As second and subsequent wave infection rates rise in many countries, the psychological distress experienced by those with personal experience or connections to COVID-19 are expected to grow. Indeed, a rapid expert consultation of healthcare workers from December 2020 notes that the full scope of the mental health impact on healthcare workers remains to be seen (NEM, 2020). However, healthcare workers were also at greater risk of psychological distress before the pandemic, and insight from previous outbreaks (SARS) warns that stress, insomnia, and suicide could follow (NEM, 2020).

Economic hardship

Because financial resources provide basic needs (e.g., safe housing, food) for oneself and one's family, self-reported financial strain imposed by the pandemic is associated with psychological distress. Indeed, in April/May 2020, French college students (n = 69,054) who indicated that they had experienced a greater loss in income reported higher anxiety, distress, stress, depression, and suicidal ideation than those who did not (Wathalet et al., 2020). Similarly, greater concern about the economic impact of the pandemic predicted higher levels of anxiety among a sample of 7,143 college students in China surveyed during January or February 2020 (Cao et al., 2020).

Time use

Several large-scale datasets offer insight into what types of behaviours are associated with higher or lower psychological distress and subjective well-being during the pandemic. For instance, in data from a longitudinal panel of 55,024 individuals in the UK surveyed between late March to late May 2020, within-person increases in time spent gardening or time in nature, exercising, reading, or listening to music predicted decreases in depression (Bu, Steptoe, Mak & Fancourt, 2020; see also Ebrahimi et al., 2021; Martinez et al., 2020). Similarly, on days when people spent more time gardening, they felt reduced levels of anxiety, and on days when people spent more time volunteering, gardening, or exercising, they reported greater life satisfaction (Bu et al., 2020). Meanwhile, more time spent following COVID-19 news predicted higher depression, higher anxiety, and lower life satisfaction in numerous datasets (Bu et al., 2020; Huckins et al., 2020; Gao et al., 2020; Lades et al., 2020; Planchuelo-Gomez et al., 2020; Wathalet et al., 2020).

Several datasets display a negative association between time spent engaging in childcare or homeschooling and subjective well-being as well as greater psychological distress. For instance, longitudinal data from the same 55,024 individuals in the UK contacted in late March to late May 2020 showed that more time spent in childcare was associated with increased feelings of depression and lower life satisfaction (Bu, Steptoe, Mak & Fancourt, 2020; Lades et al., 2020). While pre-pandemic data from 909 working women in the United States suggest that childcare is not a particularly enjoyable activity (Kahneman et al., 2004), the pandemic forced school and daycare closures around the world, which has caused a dramatic increase in childcare demands for many parents. Data from 16,908 adults in the UK and US surveyed in March – April 2020 indicate that women are spending more time in these caregiving roles and doing household chores (Adams-Prassl et al., 2020). Thus, it is not surprising that pooled data from

31,141 adults in several countries (e.g., Brazil, Canada, Denmark, US) contacted between March – June 2020 found that women engage in greater caretaking and household chores, with the latter predicting lower happiness (Giurge et al., 2021).

Summary

Taken together, evidence collected during the first year of the pandemic points to several conclusions. First, repeated cross-sectional and longitudinal datasets converge to document a significant rise in psychological distress during the early months of the pandemic, which was especially pronounced among individuals who are young, female, and parents to children under 5 years of age. However, several sources of data suggest that most (but not all) metrics of psychological distress returned to baseline, on average, by mid-2020. Second, numerous sources show no increase in suicide rates across 20+ nations. Third, nationally representative datasets depicted little change, if any, in life satisfaction across most countries, with notable exceptions (e.g., Canada, UK, United States). Similarly, several datasets document little to no change in loneliness. Finally, evidence suggests that individuals with closer proximity to illness, higher economic strain, and more household chores and childcare are at greater mental health risk. Meanwhile, people report experiencing greater mental health on days when they exercise, spend time in nature, read, or volunteer during the COVID-19 pandemic.

Table 1. Summary of the repeated cross-sectional and longitudinal evidence surveyed to consider how psychological distress, self-harm, subjective well-being, and loneliness/social connection behaviour have been impacted by COVID-19.

Facet of Mental Health	Type of Evidence	Outcome	Author(s)	Sample (*N*; location)	Data collection timing
Psychological distress	CS	Anxiety	Ebrahimi et al., 2020♦	10,061; Norway*	Mar – Apr 2020
	CS	Depression	Ebrahimi et al., 2020♦	10,061; Norway*	Mar – Apr 2020
	RCS	Anxiety	Fujiwara et al., 2020	1,982; United Kingdom*	Apr 2020
	RCS	Depression	Ettman et al., 2020	5,065; United States*	Mar – Apr 2020
	RCS	Depression	Office of National Statistics	25,935; United Kingdom*	Jan – Mar 2021
	RCS	Distress	McGinty et al., 2020	1,468; United States*	Apr 2020
	L	Anxiety	Fancourt, Steptoe & Bu, 2020	36,520; United Kingdom	T1: Mar 2020 After: Weekly
	L	Depression	Carr et al., 2020	14m clinical codes; United Kingdom	Jan 2019 – Sept 2020
	L	Depression	Fancourt, Steptoe & Bu, 2020	36,520; United Kingdom	T1: Mar 2020 After: Weekly
	L	Depression	Fetzer et al., 2020	108,075; International	Mar – Apr 2020
	L	Distress	Banks & Xu, 2020	11,980; United Kingdom*	T1: 2010-2013 T2: 2014-2016 T3: 2017-2019 T4: Apr 2020
	L	Distress	Daly & Robinson, 2021	7,319, United States*	March – July 2020
	L	Distress	Pierce et al., 2020♦	>50,000; United Kingdom*	April 2020, ongoing
	L	Distress	Proto & Quintana-Domaque, 2021	49,156; United Kingdom*	T1: 2017-2019 T2: April 2020
Self-Harm	RCS	Suicidal thoughts	Iob et al., 2020	44,774; United Kingdom	Mar – Apr 2020
	RCS	Suicidal thoughts	Knudsen et al., 2021	2,154; Norway	Jan – Sept 2020 Mar – May 2014-18, 2020
	RCS	Suicide	Pirkis et al., 2021	21 countries	Apr – July 2020

	L	Self-harm	Carr et al., 2020	14m clinical codes; United Kingdom	Apr – Sept 2020
	L	Suicidal thoughts	Brodeur et al., 2021♦	Google trends	Jan 2019 – Apr 2020
	L	Suicide	Leske et al., 2020	Australia	2015-2019; 2020
Subjective well-being	RCS	Emotion	Eurobarometer, 2020	30,000; Europe*	Sept – Dec 2020 & July – Aug 2020
	RCS	Emotion	Fao et al., 2021	99,719; United Kingdom*	June 2019 – June 2020
	RCS	Emotion	Helliwell et al., 2021	~1,000/country in 95 countries; Worldwide*	2017-2019 & Mar – Dec 2020
	RCS	Happiness	VanderWeele et al., 2020	3,020; United States*	Jan & June 2020
	RCS	Life satisfaction	Fujiwara et al., 2020	1,982; United Kingdom*	Apr 2020
	RCS	Life satisfaction	Helliwell et al., 2020	49,200 & 4,200; Canada*	2018 & June 2020
	RCS	Life satisfaction	Helliwell et al., 2021	~1,000/country in 95 countries; Worldwide*	2017-2019 & Mar – Dec 2020
	RCS	Life satisfaction	VanderWeele et al., 2020	3,020; United States*	Jan & June 2020
	L	Emotion	Brodeur et al., 2021♦	Google trends	Jan 2019 – Apr 2020
	L	Emotion	Li et al., 2020	17,865; China (Weibo users)	T1: Jan 13, 2020 T2: Jan 26, 2020
	L	Emotion	Recchi et al., 2020	779; France*	T1: 2017 T2: 2018 T3: Apr 1-8, 2020 T4: Apr 15-22, 2020 T5: Apr 29 – May 6, 2020
	L	Life satisfaction	Li et al., 2020	17,865; China (Weibo users)	T1: Jan 13, 2020 T2: Jan 26, 2020
	L	Life satisfaction	Liebig et al., 2020	25,000; Germany	Apr 2020
	L	Life satisfaction	UK Understanding Society Survey	34,318; United Kingdom*	T1: 2018-2019 T2: 2020-2021
Loneliness/ Social Connection	RCS	Loneliness	McGinty et al., 2020	1,468, United States*	Apr/May 2018 & Apr 2020
	RCS	Loneliness	Tull et al., 2020	500; United States	Mar – Apr 2020
	RCS	Social connection	Tull et al., 2020	500; United States	Mar – Apr 2020

	L	Loneliness	Brodeur et al., 2021♦	Google trends	Jan 2019 – Apr 2020
	L	Loneliness	Bu, Steptoe & Fancourt, 2020	35,712; United Kingdom	T1: Mar 2020 After: Weekly
	L	Loneliness	Fao et al., 2020	99,719; United Kingdom*	June 2019-2020
	L	Loneliness	Hansen et al., 2021	10,740; Norway	T1: Oct 2019 – Feb 2020 (varied by location) T2: June 2020
	L	Loneliness	Luchetti et al., 2020♦	1,545; United States	T1: Jan – Feb 2020 T2: Mar 2020 T3: Apr 2020
	L	Social connection	Folk et al., 2020♦	467; Canada Φ 336; mainly in United Kingdom and United States	T1: Jan – Feb 2020 T2: Apr 2020

Note: CS = Cross-Sectional, RCS = Repeated Cross-Sectional, L = Longitudinal. * indicates nationally representative or probability-based sample. ♦ = pre-registered. Φ = college student sample.

Table 2. List of studies discussed probing the impact of personal experience, financial hardship, and time use on psychological distress, self-harm, subjective well-being, and loneliness/social connection during COVID-19.

	Outcome	**Author(s)**	**Sample (*N*; location)**	**Timing**	**Nature of the data**
Personal experience	Anxiety	Cao et al., 2020	7,143; China [Φ]	Jan or Feb 2020	Cross-sectional
		Li et al., 2020	China (Weibo users)	T1: Jan 13, 2020 T2: Jan 26, 2020	Longitudinal
		Planchuelo-Gomez et al., 2020	1,056; Spain	T1: Mar/Apr 2020 T2: Apr/May 2020	Longitudinal
		Wathelet et al., 2020	69,054; France [Φ]	Apr – May 2020	Cross-sectional
	Depression	Frank et al., 2020	51,417; United Kingdom	Mar – Apr 2020	Longitudinal
		Li et al., 2020	China (Weibo users)	T1: Jan 13, 2020 T2: Jan 26, 2020	Longitudinal
		Wathelet et al., 2020	69,054; France [Φ]	Apr – Mar 2020	Cross-sectional
	Distress	Pierce et al., 2020[♦]	>50,000; United Kingdom*	Apr 2020	Cross-sectional
	Suicidal thoughts	Iob et al., 2020	44,774; United Kingdom	Mar – Apr 2020	Cross-sectional
		Wathelet et al., 2020	69,054; France [Φ]	Apr – May 2020	Cross-sectional
Financial hardship	Anxiety	Cao et al., 2020	7,143; China [Φ]	Jan or Feb 2020	Cross-sectional
		Wathelet et al., 2020	69,054; France [Φ]	Apr – May 2020	Cross-sectional
	Depression	Wathelet et al., 2020	69,054; France [Φ]	Apr – May 2020	Cross-sectional

	Suicidal thoughts	Wathelet et al., 2020	69,054; France $^{\Phi}$	Apr – May 2020	Cross-sectional
Time use	Anxiety	Bu et al., 2020	35,712; United Kingdom	T1: Mar 2020 After: Weekly	Longitudinal
		Gao et al., 2020	4,872; China	Jan – Feb 2020	Cross-sectional
		Huckins et al., 2020	178; United States $^{\Phi}$	T1: Aug – Nov 2018 T2: Jan 2020	Longitudinal
		Planchuelo-Gomez et al., 2020	1,056; Spain	T1: Mar/Apr 2020 T2: Apr/May 2020	Longitudinal
		Wathelet et al., 2020	69,054; France $^{\Phi}$	Apr – May 2020	Cross-sectional
	Depression	Bu et al., 2020	35,712; United Kingdom	T1: Mar 2020 After: Weekly	Longitudinal
		Ebrahimi et al., 2021$^{\blacklozenge}$	10,061; Norway	Mar – Apr 2020	Cross-sectional
		Huckins et al., 2020	178; United States $^{\Phi}$	T1: Aug – Nov 2018 T2: Jan 2020	Longitudinal
		Martinez et al., 2020	1,613; Brazil	May 2020	Cross-sectional
		Wathelet et al., 2020	69,054; France $^{\Phi}$	Apr – May 2020	Cross-sectional
	Happiness	Giurge et al., 2021$^{\blacklozenge}$	30,018; International	Mar – June 2020	Longitudinal
	Negative affect	Lades et al., 2020	604; Ireland	Mar 2020	Cross-sectional

Note: * indicates nationally representative or probably based sample. $^{\blacklozenge}$ = pre-registered. $^{\Phi}$ = college student sample.

Recommendations

The data above describes the varied, unequal, and complex changes in mental health observed in the face of the COVID-19 pandemic. While we have tried to synthesize the most informative studies to convey robust patterns of evidence, knowing how to respond to these insights may be unclear. Therefore, to help governments, businesses, and individuals take action, we offer seven research-grounded recommendations (one urgent, two short-term, and four ongoing) to support mental health during the pandemic and beyond. These recommendations aim to help people across the spectrum, from mental illness to well-being (see Figure 2).

Figure 2. The mental health continuum.

Urgent recommendation

Recommendation 1. We call upon researchers, governments, and funding bodies to support immediate, large-scale research to understand the nature, treatment, and long-term consequences of COVID-19 on mental health and the brain (Holmes et al., 2020). Indeed, while

this review summarizes the fast growing and evolving evidence on COVID-19 and mental health, we do not yet know the duration and long-term impacts of this global challenge. As the number of people infected with the virus continues to climb, humanity needs greater insight into how to support those who become infected, as well as those who care for the infected (de Erausquin et al., 2020). Moreover, greater knowledge is needed to understand how most people have altered their lives, as well as what factors have supported or challenged mental health during this time. Future challenges (pandemic or otherwise) lie ahead. Increased psychological insight from this unprecedented event can help inform decision making and policy.

Short-term recommendations

Recommendation 2. We encourage physicians, nurses, and other mental health care professionals to systematically screen for and monitor a range of short and long-term mental health dimensions among COVID-19 survivors and close relations. Given the evidence above indicating that various forms of personal experience with the virus – from worries about personal safety to concern that close others have contracted COVID-19 (e.g., Wathalet et al., 2020) – are associated with greater psychological distress, public health nurses or volunteers could follow-up with patients, COVID-19 test-takers, and family of those who have been ill due to COVID-19 to screen for psychological distress concerns. Early awareness of distress could trigger contact from a trained professional, who could then direct the individual to local mental health resources. Similarly, just as people with greater burden of care (e.g., health care workers, teachers) and risk exposure (e.g., grocery store clerks, factory workers) have been prioritized for physical care through early vaccination, so too should these individuals be monitored and supported with greater mental health care (see Figure 1).

Recommendation 3. We recommend prioritizing safe access to childcare and elementary schooling during the pandemic. Early education and childcare provide learning, socialization, and food access opportunities to countless children around the world, as well as intervention for safety when needed (e.g., Hoffman & Miller, 2020; Mayurasakorn et al., 2020). In addition, elementary education and childcare allows working parents to attend to employment tasks with fewer disruptions, chores, and multi-tasking demands. Thus, safe accessibility to these essential services would benefit several at-risk groups, including young women and all caregiving parents with young children (< 5 years of age) at home, experiencing disproportionate psychological distress and possible increases in self-harm during the pandemic (Pierce et al., 2020; Ueda et al., 2020).

Ongoing recommendations

Recommendation 4. The COVID-19 pandemic offers a critical opportunity to invest in and strengthen mental health care systems to achieve a "parity of esteem," meaning that someone who is mentally ill should have equal access to evidence-based treatment as someone who is physically ill. As this review demonstrates, COVID-19 led to an early increase in psychological distress, and elevated reports of depression persisted for months. Yet, in a sample of 44,775 UK adults surveyed between late March to late April, only 40% of people reporting self-harm and suicidal ideation accessed one or more means of formal mental health support services during the first month of lockdown (Iob et al., 2020). Similarly, only 12% of college students in France expressing psychological distress concerns reported seeking professional help (Wathalet et al., 2020). Given that the current concern and interest in mental health and subjective well-being might fade, we argue that now is the time to invest in mental health care systems. Ideally these services will be free or heavily subsidized so that they are accessible to all. Doing so will help

ease the burden of the pandemic and build resources so that individuals, communities, and nations are better able to handle future stressors.

Recommendation 5. Specific mental health resources and actions should be tailored to the resources available, but at the very least should include online cognitive behaviour therapy treatments supplemented by locally trained, although possibly lay, mental health practitioners. Offering universal recommendations is challenging given the range in resources (i.e., low vs high income countries), as well as cultural and ethnic practices (Diala et al., 2001; Gonzalez et al., 2013). However, several overarching suggestions emerge. First, the physical distancing requirements to slow the spread of the virus make online mental health treatments an attractive and viable option. Online cognitive behaviour therapy (eCBT) has been shown to be effective in treating depression, anxiety, and loneliness, and should therefore be widely available (Etzelmueller et al., 2020; Masi, 2011; Phillips et al., 2019). Second, eCBT sessions should be supplemented by occasional meetings with a therapist or local mental health practitioner. If therapists and practitioners are scarce, community members could be trained to help with implementation and support–but care should be taken because scaling and one-off training can undermine high-fidelity treatment. Fortunately, early data from Ethiopia, Thailand, parts of India, and the UK suggest that newly trained practitioners and even peers can be effective in task-sharing when supported through community mobilization, strong leadership, awareness, stigma reduction, and support provision, as well as credit and recognition (Shidhaye et al., 2017; Singla et al., 2017; Van Ginneken et al., 2017). Third, future research is needed to continue examining the efficacy of scaled treatment (Eaton et al., 2011), and to identify eCBT resources that are effective cross-culturally and available in relevant translations.

Recommendation 6. Individuals and organizations, including health care providers, should supplement existing mental health care with well-being promotion. The positive psychology literature offers a range of relatively easy, low-cost evidence-based strategies that can be implemented to increase the frequency of positive emotions and well-being (VanderWeele, 2020). Strategies include mindfulness (Campos et al., 2016; Fredrickson et al, 2008; Grossman et al., 2004), gratitude (Davis et al., 2016), practicing kindness or generosity (Aknin et al., 2020; Curry et al., 2018; Dunn et al., 2014), and self-compassion or imagining one's best possible self (King, 2001; Malouff & Schutte, 2017). These tools may be especially useful during the pandemic because they target both positive and negative emotions, which people report having declined and increased, respectively, through COVID-19 (VanderWeele, 2020; Waters et al., 2021). As such, these practices could help bolster well-being so that people move from left to right on the mental health continuum shown in Figure 2. These strategies may be particularly useful because, unlike professional mental health care, these strategies are typically brief, accessible, convenient, self-administered, and non-stigmatizing. While meta-analyses and/or the use of large pre-registered studies support their efficacy, theorizing suggests that strategies may be more or less effective when considering features of the activity (i.e., its variety-stability), features of the actor (i.e., high vs. low motivation), and person-activity fit (see Lyubomirsky & Layous, 2013).

Recommendation 7. Governments and organizations should facilitate access to mental health care and the promotion of well-being alongside social care. Providing citizens or employees with a list of available treatment options has not proven sufficient. Mental health and well-being activities should involve promotion and community outreach, contained within the structure of a citizen's daily life. For instance, schools, workplaces, and community centers

should include courses in positive education and positive psychology (Joyce et al., 2016; Kitchener & Jorm, 2004; LaMontangne et al., 2014). Teachers and workplace managers may be more open to these ideas now, while responding to the stressors and adjustments of the pandemic, and effective models are available online (e.g., Action for Happiness). To increase the likelihood that valuable resources reach vulnerable populations that need them most, access to and treatment with evidence-based mental health care services should be embedded within existing systems, such as social services, welfare, poverty alleviation, and social development programs (Patel & Saxena, 2019). Such efforts to build upon existing programs and commitments (e.g., universal health coverage, other priority programs) would help to *build back better* and implement a whole government approach to the pandemic that affects all dimensions of our lives. A roadmap to strengthen global mental health systems to tackle the impact of the COVID-19 pandemic has been proposed and needs to be urgently implemented (Maulik, Thornicroft & Saxena, 2020).

Conclusion

COVID-19 poses one of the largest collective challenges of our lifetime. While efforts to contain and defeat the virus have understandably been prioritized, mental health should not be ignored during the pandemic or afterward. The impact of the COVID-19 pandemic will likely extend into the future through secondary effects on employment levels, poverty, social inequality, and more (Banks, Fancourt & Xu, 2021).

Widespread vaccination and the return of pre-pandemic life is unlikely to be immediate, or fully address the mental health patterns reported here. In fact, we recommend *increasing* (not lowering) attention to mental health over the next few years to prevent widening the gap between mental health and physical health care, which could occur for at least two reasons. First, large-

scale vaccination will require substantial investment in physical health care. Adding this atop the need to reinstate routine physical care will involve significant human, economic, and coordination resources. Second, with physical safety improving, policy makers and the public may assume that most people are prepared to return to a pre-pandemic routine without attending to the strains on mental health documented here. Thus, we encourage researchers and policy makers to continue monitoring and supporting mental health beyond virus containment and vaccination.

As noted in the introduction, most of the large-scale evidence summarized in this report is drawn primarily from Western, Educated, Industrialized, Rich, and Democratic nations (Henrich et al., 2010). While these data offer valuable early insight into how various facets of mental health and well-being are faring during the COVID-19 pandemic in the locations surveyed, nations varied widely in their initial response to the pandemic (Hale et al., 2021). This reality requires careful consideration when trying to understand mental health responses in lower- and middle-income countries (Kola et al., 2021) as well as global trends. Thus, this limitation raises important opportunities for future research.

A large literature documents the far-reaching pain caused by mental illness (Layard & Clark, 2015) and, conversely, the numerous benefits of subjective well-being (Lyubomirsky, King & Diener, 2005). As such, subjective well-being measurement and considerations should guide policy, both during the pandemic (e.g., when deciding when to impose and release government lockdowns; De Neve et al., 2020) and beyond (Diener et al., 2009; Diener & Seligman, 2004; Helliwell, 2019; Oishi & Diener, 2014; Sachs, 2019). This refocus should help in several ways. First, it could help to slow the spread of the virus. Recent findings suggest that happier people have stronger immune systems (Diener et al., 2017), and are more likely to

comply with public health measures, such as staying home and maintaining physical distance (Krekel at al., 2020). Indeed, recent evidence indicates that people with greater psychological distress are more likely to have missed or delayed vaccinations during the COVID-19 pandemic (Shapiro et al., 2020). Second, supporting happiness may target other undesirable outcomes, such as “pre-bunking” conspiracy theories and misinformation (Cichocka, 2020). Finally, a greater focus on subjective well-being would bring the personal experience of citizens to center stage, necessitating ongoing and greater support to help people live fuller, more enjoyable, and connected lives.

Table 3. Summary of urgent, short-term, and ongoing recommendations to address and support mental health during the COVID-19 pandemic and beyond.

Urgent	
	Recommendation 1. Support immediate, large-scale research into the nature, treatment, and long-term consequences of COVID-19 on mental health.
Short-term	
	Recommendation 2. Encourage physicians, nurses, and other mental health care professions to systematically screen for and monitor a range of short- and long-term mental health dimensions among COVID-19 survivors, close relations, as well those with greater exposure risk or burden of care.
	Recommendation 3. Prioritize safe access to childcare and elementary schooling.
Ongoing	
	Recommendation 4. Invest in mental health care such that someone with mental illness has equal access to evidence-based treatment as someone who has physical illness.
	Recommendation 5. Specific mental health resources and actions should be tailored to the resources available, but at the very least should include online cognitive behaviour therapy treatments supplemented by locally trained, although possibly lay, mental health practitioners.
	Recommendation 6. Individuals and organizations should supplement existing mental health care with well-being promotion.
	Recommendation 7. Governments and organizations should facilitate access to mental health care and the promotion of well-being alongside social care.

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