Evidence Review – Surge Planning for Mental Health

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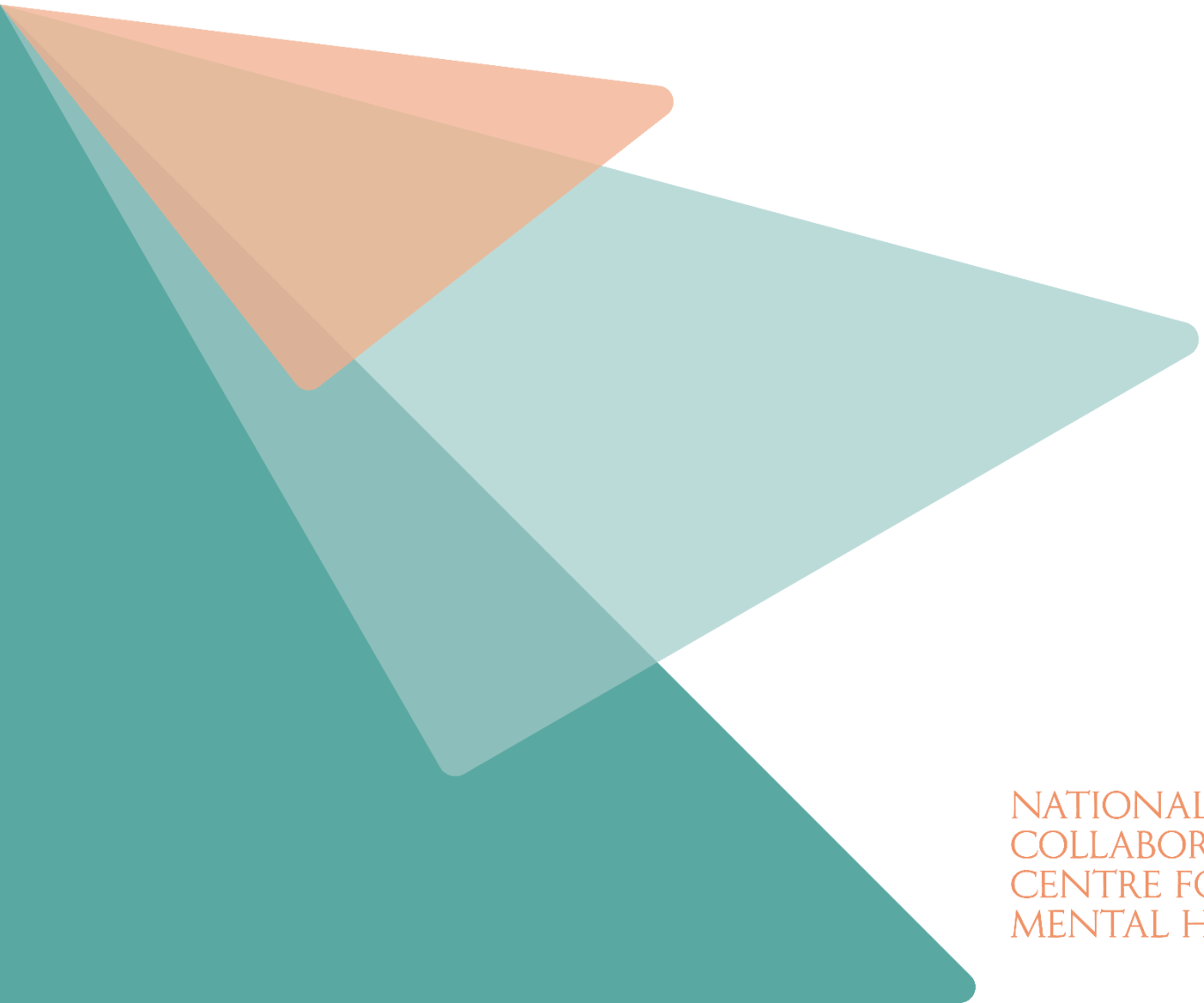

NATIONAL COLLABORATING CENTRE FOR MENTAL HEALTH

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Executive Summary

The COVID-19 pandemic has an unprecedented impact on national and international healthcare systems. The consequences of governmental responses to the pandemics including national lockdowns, 'stay at home' orders and the requirements to quarantine[1], as well as fear of the effects of the virus, have been anticipated to create a substantial increase in the need for mental health support[2]. However, there is uncertainty as to how and when this increase or surge in need will arrive, with primary care reporting decreases in referrals for individuals with mental health concerns, whilst antidepressant prescribing has increased[3]. The mental health impact of the pandemic may take time to be fully established, and it is likely that some groups of individuals will be more impacted than others. Being able to anticipate a potential surge in mental distress and the impact on the NHS, through identifying risk factors for increased needs, could help optimise the delivery of appropriate care for at-risk groups.

The aim of this review was to assess whether there is currently evidence of the COVID-19 Pandemic impacting on the incidence and prevalence of mental health problems in the UK , to identify potential risk-factors requiring consideration in the planning of future mental health service provision.

The following clinical areas were explored:

- ➔ Common mental disorders (CMD)
- ➔ Severe mental illness (SMI)
- ➔ Neurodevelopment disorders
- ➔ Substance misuse
- ➔ Dementia

The impact on the following areas was included in this review of the evidence:

- ➔ Changing patterns of prevalence of mental health problems during the COVID-19 pandemic
- ➔ Impact on mental health service utilisation during the COVID-19 pandemic
- ➔ Differential impact of COVID-19 pandemic on subgroups:
    - Young people (aged 1-5, 6-13, 14-25)
    - NHS and social care staff
    - BME groups

[1] Greenberg, N., Docherty, M., Gnanapragasam, S., & Wessely, S. (2020). Managing mental health challenges faced by healthcare workers during COVID-19 pandemic. BMJ, 368, m1211. https://doi.org/10.1136/bmj.m1211

[2] Luykx, J. J., Vinkers, C. H., & Tijdink, J. K. (2020). Psychiatry in times of the coronavirus disease 2019 (COVID-19) pandemic: An imperative for psychiatrists to Act Now. JAMA Psychiatry, 77(11), 1097–1098. https://doi.org/10.1001/jamapsychiatry.2020.1225

3 Armitage, R (2021)..Antidepressants, primary care, and adult mental health services in England during COVID-19,The Lancet Psychiatry, 8(2),e3. https://doi.org/10.1016/S2215-0366(20)30530-7.

Methods and data sources

In order to review the available evidence in the timeframe, two distinct lines of enquiry were explored – firstly a systematic review of systematic reviews reporting on the prevalence of mental health conditions during the COVID-19 pandemic, focusing on UK-based studies, and secondly analysis of longitudinal general population cohort data, and data from mental health services.

Systematic review of systematic reviews

- ➔ Search electronic databases – CINAHL, Medline, PsycInfo and Embase
- ➔ Include reviews using systematic methods
- ➔ Extract evidence primarily from the UK, supplemented by European data where necessary.

Analysis of incidence/prevalence rates from UK-based studies and datasets

- ➔ Identify studies including standardised mental health measures, and calculate incidence of mental health problems where data is available.
- ➔ Will focus on large longitudinal cohort studies for population-based incidence data.
- ➔ Smaller datasets considered to explore sub-groups.

Data was drawn from 12 systematic reviews, a number cohort studies, and NHS databases.

Key findings

- The majority of the available data centred on common mental disorders (CMDs), with studies using validated measures of depression and generalised anxiety such as the PHQ-9 and GAD-7.
- Data from one longitudinal study, the UCL COVID-19 Social study[4], showed that whilst depression and anxiety was slightly higher at the start of the pandemic, for the majority of people it was below clinical threshold, and decreased over time. This finding was replicated in other UK-based longitudinal studies.
- Data from Improving Access to Psychological Therapies (IAPT) services showed that nationally there was a decrease in both the number of referrals and patients entering treatment for CMDs at the start of the pandemic, and that the numbers referred and attending is still below pre-pandemic levels at present, although closer to pre-pandemic levels.
- There was limited published (and peer-reviewed) data on Severe Mental Illness (SMI), dementia, substance misuse and neurodevelopmental disorders. Available evidence, often from pre-publication manuscripts (therefore not peer-reviewed and formally published), indicated secondary care mental health service use initially decreased at the start of the pandemic (as seen in primary care) although there was little long-term data.
- Current evidence suggests that CMD is more prevalent in younger people and women, following pre-pandemic findings, and the differences between groups reminded consistent during the pandemic. Of note, data from one IAPT service suggested there had been no observable increase in referrals for younger people (18-24 years) during the pandemic.
- There was less available data on younger children, and findings were mixed. Some studies suggested small increases in CMDs, whereas others indicated potential gender differences. The lack of evidence indicates a need for further research in this population.
- For people of Ethnic Minority groups, the incidence of observable CMDs in the general population was higher than for White groups at all observed points during the pandemic.

[4] Fancourt, D., Steptoe, A., & Bu, F. (2020a). Trajectories of anxiety and depressive symptoms during enforced isolation due to COVID-19 in England: A longitudinal observational study. The Lancet Psychiatry, 8(2), 141–149. https://doi.org/10.1016/S2215-0366(20)30482-X

Whilst the proportion of referrals to a London IAPT service that are from Ethnic Minority groups has increase in the last year, it is in line with the pre-pandemic trend.

- The evidence on the impact for health and social care workers was less clear. Data from cohort studies indicated slightly higher rates of CMD, especially depression, in health and social care workers in the most recent months. Evidence from reviews suggested higher prevalence in frontline health and social care workers compared to non-frontline health and social care workers, and studies on specific groups of workers such as ICU staff have suggested increased PTSD prevalence[5].
- The group found to demonstrate the highest incidence of CMDs were people who had previously been diagnosed with a mental health condition, who appear to be particularly vulnerable.

Limitations

- The systematic review identified existing reviews of the literature, and observed limited research exploring non-CMD prevalence. A number of UK-based studies were identified only through preprint servers, which means they are currently undergoing peer-review and therefore are not formally published. This suggests additional evidence is likely to be available over the coming months, indicating a need to systematically explore the area on a re-occurring basis. In addition many studies report data on the first 6-8 months of the pandemic. As such, the impact of aftermath of the first wave and the impact of the second wave will not be seen in much of the data reviewed
- Data from general population studies are likely to have biased samplings, despite attempts for stratified sampling and use of survey weights, and therefore harder to reach groups who may have more severe mental problems may not be present in the data.
- Nationally published mental health data, such as IAPT, is currently available only in aggregate form and does not include data on potential risk factors such as age and ethnicity groups. Utilising data from local services in this report could limit the generalisability of findings.
- There is the potential for risk factors such as changes in employment and income, as well as the longer term impact of changes of the furlough policy, to negatively impact on mental health, but the current data limited exploration of this issue.
- Some disorders may take time to present to services, for example people with PTSD may not present to services for some considerable time after the exposure to trauma.
- Whilst referrals to services may have decreased, it is has been suggested that the severity of illness may have increased due to pandemic related constraint on access to effective treatment.

Recommendations

- Whilst the rate of mental health problems has not shown a consistent increase in the studies reviewed, further monitoring through general population studies and trends in mental health service utilisation should be considered to identify changes in demand, particularly for those with existing disorders or who are at-risk group.

[5] Greenberg, N., Weston, D., Hall, C., Caulfield, T., Williamson, V., & Fong, K. (2021). Mental health of staff working in intensive care during COVID-19. Occupational Medicine. Advance online publication. https://doi.org/10.1093/occmed/kqaa220

- Reviews of the available evidence conducted at routine time points would synthesise the emerging literature, especially for non-CMD prevalence, and take into account the 'time lag' for the presentation of some disorders.
- Exploring the severity/acuity of presentations to services, rather than just the observed count might optimise support and surge planning.
- The impact of potential for risk factors such as negative changes in employment status and income (which are known to impact on mental health), as well as the impact of changes of the furlough policy, should be considered in any future reviews
- Data on children and young people is across the 0-25 age range is very limited. Given the long-term consequence of many childhood disorders this should be a priority for future reviews.
- Data on older people, in particular those with dementia, and those with neurodevelopmental disorders across the age range is also very limited and again should be a priority for future reviews.

Evidence from umbrella review:

Umbrella review

This review, "The impact of the COVID-19 pandemic on mental health: an umbrella review" has been registered on the International prospective register of systematic reviews, PROSPERO (registration number: CRD42021244866).

Research questions

1. What is the prevalence of mental health problems during the covid-19 pandemic?
    a. Common mental health conditions
    b. Severe mental illness
    c. Neurodevelopmental disorders
    d. Substance misuse
    e. Dementia
2. Has there been a change in the pattern of prevalence of mental health problems over time during the COVID-19 pandemic?
3. Has there been an impact on mental health service utilisation during the COVID-19 pandemic?
4. Has there been a disproportionate impact of the COVID-19 pandemic on specific characteristics or vulnerable groups? Specifically;
    a. young people (aged 1-5, 6-12, 16-25),
    b. NHS and social care staff
    c. Black, Asian and Minority Ethnic groups

Method

This review of reviews (umbrella review) was completed in accordance with the World Health Organisation Rapid Reviews to strengthen Health Policy and systems: A Practical Guide.

Search strategy

Electronic databases MEDLINE (Ovid), PsycInfo (Ovid), Embase (Ovid), CINAHL and the Cochrane library will be searched. These searches will be supplemented with manual searching of included

reviews bibliographies and medRxiv. Searches will be limited to English language and publication after December 2019. Searches include key terms relating to mental health conditions, the COVID-19 pandemic and systematic reviews (please see appendices for full search strategies).

Study selection

Reviews of any population affected by the COVID-19 pandemic will be included, reporting prevalence of mental health symptoms, according to diagnostic criteria or a validated scale and cutoff, cross-sectionally or longitudinally will be included. Reviews addressing the utilisation of mental health services will also be included. Systematic reviews (including rapid systematic reviews) with or without meta-analyses will be considered for inclusion. Reviews will be considered for inclusion if they have searched at least 3 databases and include a quality assessment.

Outcomes

Systematic reviews will be identified that have reported at least one of the following; 1. Prevalence of mental health symptoms before and/or during the COVID-19 pandemic, 2. Rates of mental health service use before and/or during the COVID-19 pandemic.

Data extraction

One reviewer will screen the titles and abstracts of all identified references. The full texts of potentially relevant guidelines will be screened by the same reviewer. Data from each relevant review will be extracted using Microsoft Excel spreadsheets that have been pre-piloted.

For all included reviews, the following information will be extracted;

1. Author and year of publication
2. Search strategy (databases searched, dates of searches, inclusion/exclusion criteria)
3. Setting (type of mental health service)
4. Included publication details (number of included studies, country where studies was conducted, list of included studies, study designs, population details (e.g. general population, healthcare staff etc))
5. Participant details (number of participants, gender, ethnicity, age, mental health diagnosis)

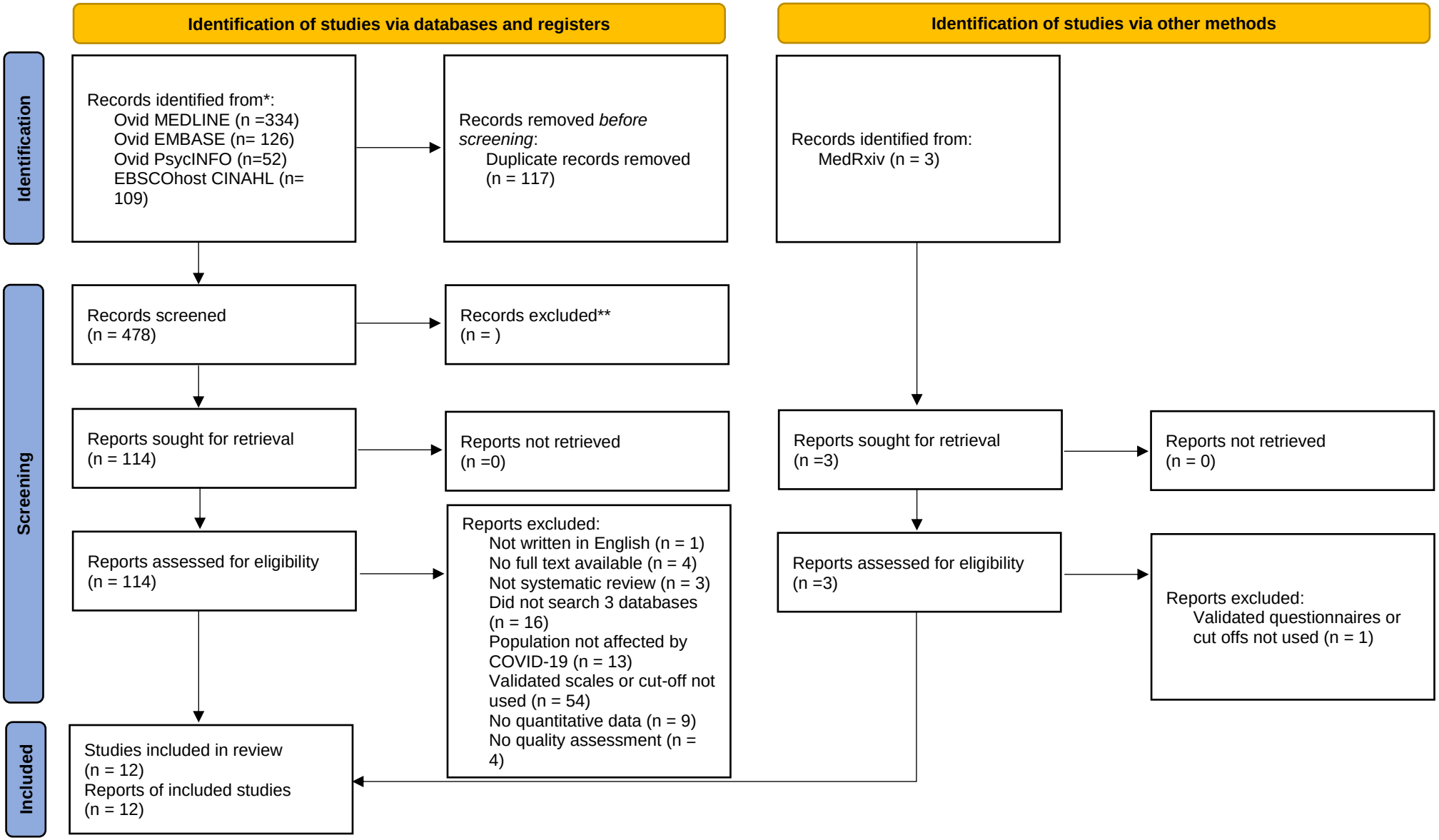
Strategy for data synthesis

This will be comprised of a narrative synthesis of the extracted data population characteristics and type of outcome. The prevalence of mental health problems and the rates of service utilisation will be compared across reviews.

Analysis of subgroups

The impact of the COVID-19 pandemic on the mental health of specific sub groups is largely unknown. If there is available data, the prevalence of mental health problems and rates of service utilisation in vulnerable populations, including young people, Black, Asian and Minority ethnic groups, healthcare staff will be considered.

Figure 1: PRISMA diagram



Results

Included studies

A total of 12 systematic reviews met inclusion criteria for this umbrella review (see PRISMA diagram). The characteristics and results of the included reviews are reported in table A6 and A7 in the appendices. These studies only reported on rates of depression or anxiety, with no reviews of SMI, substance misuse, neurodevelopmental disorders or dementia identified.

Anxiety

The pooled prevalence for anxiety reported in the included reviews ranged from 15.15% to 34%. Two reviews compared the prevalence of anxiety in healthcare staff and the general population and found no difference[6,7]. A review by Chen et al[8], found a higher prevalence of anxiety in frontline staff (28%) compared to general healthcare workers (22%). One review found that those with pre-existing mental and physical health conditions had a higher prevalence of anxiety[6]. There was no evidence in the reviews to suggest a difference in prevalence rates for gender or age[9].

Three reviews included studies that assessed anxiety pre and post the pandemic onset[10,11,12]. Small but significant increases in anxiety have been found (e.g. anxiety pre to post pandemic (SMC = .125 [95% CI: .019 to .230], z = 2.31, p = .021).[10]

The UK only data was extracted from the included reviews and the results were largely similar with the prevalence of anxiety reported as between 24.4% and 34% and small increases in anxiety scores.

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[6] Luo M, Guo L, Yu M, Jiang W, Wang H. The psychological and mental impact of coronavirus disease 2019 (COVID-19) on medical staff and general public - A systematic review and meta-analysis. Psychiatry Research. 2020;291:113190.

[7] Cenat JM, Blais-Rochette C, Kokou-Kpolou CK, Noorishad PG, Mukunzi JN, McIntee SE, et al. Prevalence of symptoms of depression, anxiety, insomnia, posttraumatic stress disorder, and psychological distress among populations affected by the COVID-19 pandemic: A systematic review and meta-analysis. Psychiatry Research. 2021;295:113599.

[8] Chen X, Chen J, Zhang M, Chen RZ, Dong RK, Dong Z, et al. One Year of Evidence on Mental Health in the COVID-19 Crisis-A Systematic Review and Meta-Analysis. medRxiv. 2021.

[9] Wang Y, Kala MP, Jafar TH. Factors associated with psychological distress during the coronavirus disease 2019 (COVID-19) pandemic on the predominantly general population: A systematic review and meta-analysis. PLoS ONE [Electronic Resource]. 2020;15(12):e0244630.

[10] Robinson E, Sutin AR, Daly M, Jones A. A systematic review and meta-analysis of longitudinal cohort studies comparing mental health before versus during the COVID-19 pandemic. medRxiv. 2021.

[11] Thombs BD, Bonardi O, Rice DB, Boruff JT, Azar M, He C, et al. Curating evidence on mental health during COVID-19: A living systematic review. Journal of Psychosomatic Research. 2020;133:110113.

[12] Hessami K, Romanelli C, Chiurazzi M, Cozzolino M. COVID-19 pandemic and maternal mental health: a systematic review and meta-analysis. Journal of Maternal-Fetal & Neonatal Medicine. 2020:1-8.

Depression

The pooled prevalence of depression ranged from 15.97% to 28%. Two reviews reported the prevalence of depression in healthcare staff compared to the general population and found no difference[13][14]. One review reported that a higher prevalence of depression in frontline staff compared to general healthcare staff (20% vs 15%). Luo et al.[15] reported a higher prevalence of depression in those with pre-existing mental and physical health conditions compared to healthcare workers and the general population. There was no evidence in the reviews to suggest a difference in the prevalence of depression for gender or age[16]

Three reviews included studies that assessed depression pre and post the pandemic onset[17][18][19]. There was a small significant increase in symptoms of depression pre to post pandemic outbreak (SMC = .216 [95% CI: .135 to .296], z = 5.24, p < .001)[20]

The UK only data was extracted from the reviews with studies reporting the prevalence of depression as between 15% and 31.4% and a small increase in depression was seen pre to post pandemic onset.

Summary

This umbrella review identified 12 reviews of the prevalence of mental health problems during the COVID-19 pandemic, all of which looked at common mental disorders. Increases during the pandemic were identified as small, and people with previously diagnosed mental health conditions were observed to be most at-risk, alongside frontline healthcare workers (but not non-frontline workers) noted to be possible increased risk.

[13] Luo M, Guo L, Yu M, Jiang W, Wang H. The psychological and mental impact of coronavirus disease 2019 (COVID-19) on medical staff and general public - A systematic review and meta-analysis. Psychiatry Research. 2020;291:113190.

[14] Cenat JM, Blais-Rochette C, Kokou-Kpolou CK, Noorishad PG, Mukunzi JN, McIntee SE, et al. Prevalence of symptoms of depression, anxiety, insomnia, posttraumatic stress disorder, and psychological distress among populations affected by the COVID-19 pandemic: A systematic review and meta-analysis. Psychiatry Research. 2021;295:113599.

[15] Luo M, Guo L, Yu M, Jiang W, Wang H. The psychological and mental impact of coronavirus disease 2019 (COVID-19) on medical staff and general public - A systematic review and meta-analysis. Psychiatry Research. 2020;291:113190.

[16] Wang Y, Kala MP, Jafar TH. Factors associated with psychological distress during the coronavirus disease 2019 (COVID-19) pandemic on the predominantly general population: A systematic review and meta-analysis. PLoS ONE [Electronic Resource]. 2020;15(12):e0244630.

[17] Thombs BD, Bonardi O, Rice DB, Boruff JT, Azar M, He C, et al. Curating evidence on mental health during COVID-19: A living systematic review. Journal of Psychosomatic Research. 2020;133:110113.

[18] Robinson E, Sutin AR, Daly M, Jones A. A systematic review and meta-analysis of longitudinal cohort studies comparing mental health before versus during the COVID-19 pandemic. medRxiv. 2021.

[19] Hessami K, Romanelli C, Chiurazzi M, Cozzolino M. COVID-19 pandemic and maternal mental health: a systematic review and meta-analysis. Journal of Maternal-Fetal & Neonatal Medicine. 2020:1-8.

[20] Robinson E, Sutin AR, Daly M, Jones A. A systematic review and meta-analysis of longitudinal cohort studies comparing mental health before versus during the COVID-19 pandemic. medRxiv. 2021.

Prevalence and utilisation data from UK-based studies and services.

Common Mental Disorders (CMDs)

The majority of cohort studies exploring mental health status during the pandemic have included only measures of CMDs. In this section of the report, data on the prevalence of CMDs is taken from the UCL COVID-19 Social Study, a longitudinal cohort study following the impact of the pandemic on mental health and wellbeing in the UK general population[21]. Raw data was provided by the study's principle investigator, which was analysed for the current report. The main findings from the COVID-19 Social Study have been replicated in other UK-based longitudinal cohort studies, and further data presented in this report has not been formally published by the study team at present.

Data on mental health service utilisation for CMD related distress is taken from the Improving Access to Psychological Therapies (IAPT) services. These national services provided evidence-based psychological treatment for CMDs, and received over 1.6 million referrals in the year proceeding the pandemic. National aggregate data is reported by NHS Digital[22], and further data on referral numbers by patient demographics (e.g. age, gender, ethnicity) was provided by an IAPT service in London which forms part of the UCL North and Central East London IAPT Service Improvement and Research Network (NCEL IAPT SIRN)[23].

Prevalence

Figure 2 presents the average Patient Health Questionnaire (9-items)[24] and Generalised Anxiety Disorder scale (7-items)[25] each month from March 2020 (start of the first national lockdown) until March 2021, collected as part of the UCL COVID-19 Social Study. The highest scores were observed early on in the pandemic, fell and then levelled off after summer 2020. However, the average score was below the threshold for clinically observable depression/anxiety (a score of above 10 on both measures) for all months. It should be noted that the study moved from weekly to monthly collection of data from participants from August 2020, and therefore it is possible the increase into September was associated with this change in methodology.

The proportion of scores above the clinical thresholds on each measure was 23% (GAD-7) and 27% (PHQ-9) in March 2020, which decreased to 11% (GAD-7) and 16% (PHQ-9) in August 2020 and was at 14% (GAD-7) and 22% (PHQ-9) in March 2021.

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[21] Fancourt, D., Steptoe, A., & Bu, F. (2020a). Trajectories of anxiety and depressive symptoms during enforced isolation due to COVID-19 in England: A longitudinal observational study. The Lancet Psychiatry, 8(2), 141–149. https://doi.org/10.1016/S2215-0366(20)30482-X

[22] https://digital.nhs.uk/data-and-information/publications/statistical/psychological-therapies-report-on-the-use-of-iapt-services

[23] Saunders, R., Cape, J., Leibowitz, J., … Buckman, J. E. J. (2020). Improvement in IAPT outcomes over time: Are they driven by changes in clinical practice? Cognitive Behaviour Therapist, 13, e16. https://doi.org/10.1017/S1754470X20000173

[24] Kroenke, K., Spitzer, R. L., &Williams, J. B.W. (2001). The PHQ-9: Validity of a brief depression severity measure. Journal of General Internal Medicine, 16, 606–613.

[25] Spitzer, R. L., Kroenke, K., Williams, J. B. W., & Löwe, B. (2006). A brief measure for assessing generalized anxiety disorder. Archives of Internal Medicine, 166(10), 1092. https://doi.org/10.1001/archinte.166.10.1092

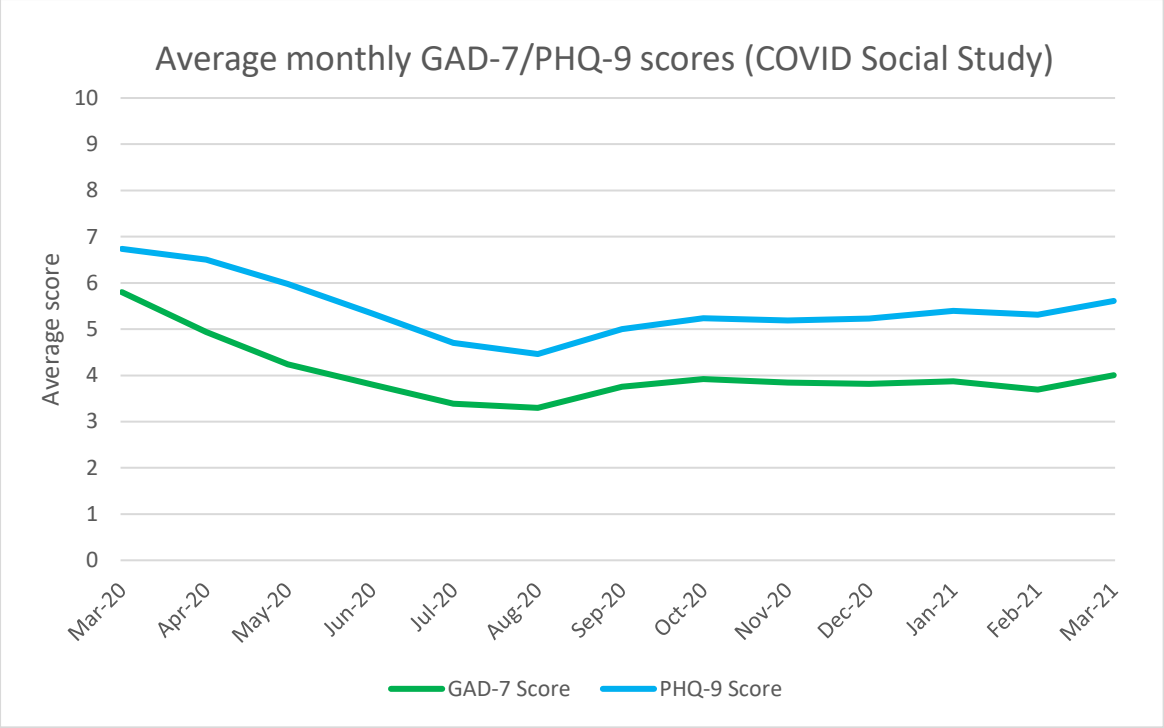

Figure 2: Mean PHQ-9 and GAD-7 scores each month for participants of the UCL COVID-19 Social Study (data accessed with permission from Dr Daisy Fancourt).

Data from another UK-based longitudinal study (the UK Household Longitudinal Survey) included data from before the pandemic, and suggested a small increase in average General Health Questionnaire (GHQ) scores in May 2020 compared to the previous year. Scores then decreased to October 2020, although the score was still slightly higher than pre-pandemic levels[26]

Utilisation

The number of referrals and people entering treatment at all IAPT services in England before and during the pandemic (to Dec 2020) is presented in Figure 3. There was a significant decrease in the number of referrals in March and April 2020 corresponding with the first national lockdown, followed by a steady increase in referrals. The number of referrals is currently below that of previous years, although the number entering treatment is reported to be at the same level.

[26] Preprint: Pierce, M, McManus, S…& Abel, K (2021). Different Mental Health Responses to the COVID-19 Pandemic: Latent Class Trajectory Analysis Using Longitudinal UK Data. Available at SSRN: https://ssrn.com/abstract=3784647 or http://dx.doi.org/10.2139/ssrn.3784647

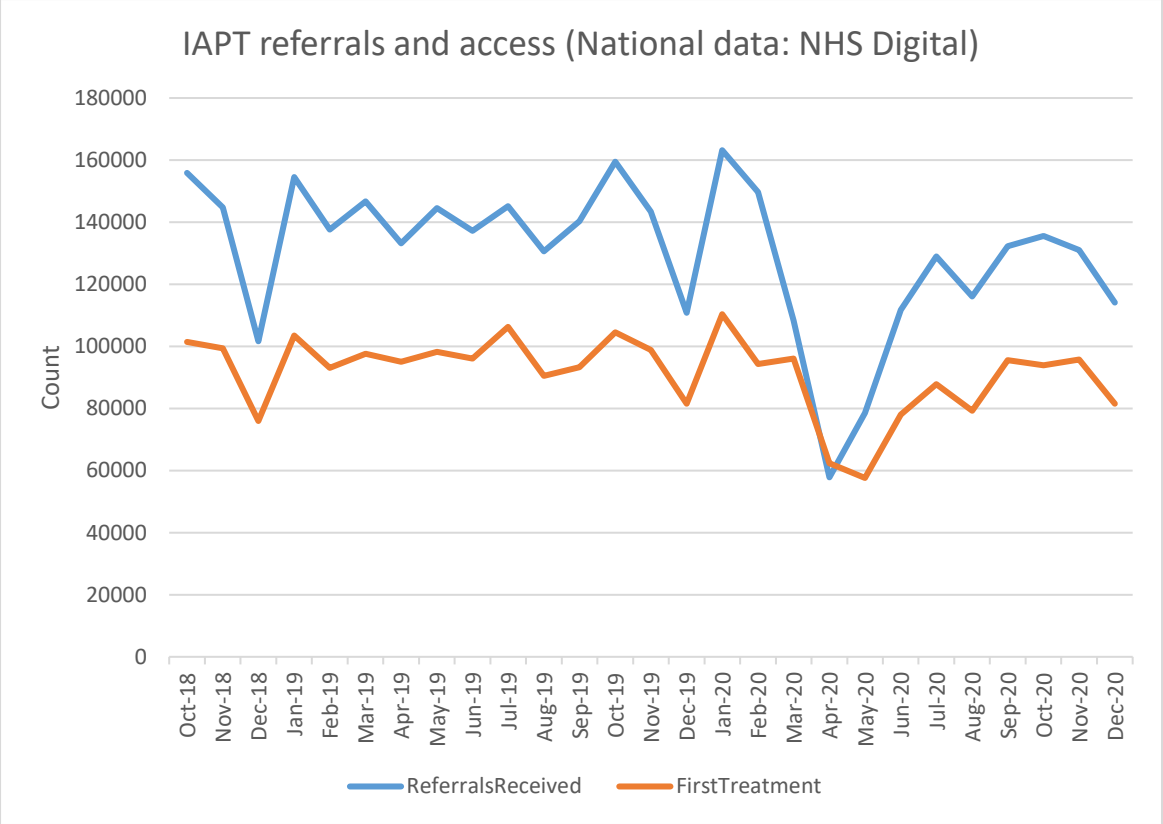

Figure 3. Count of monthly referrals to IAPT services in England between Oct 2018 and Dec 2020 *(data accessed through the NHS Digital IAPT reporting website – by monthly extract[27]).*

[27] https://digital.nhs.uk/data-and-information/publications/statistical/psychological-therapies-report-on-the-use-of-iapt-services

Potential at-risk sub-groups

The incidence and rate of utilisation for CMDs by potentially at-risk sub-groups was explored using data from both the COVID-19 Social study and from a London-based IAPT service which provided referral data by patient demographics.

Age

The proportion of participants above the clinical threshold on the PHQ-9 and GAD-7 scores for different age groups is presented in figure 4, and indicates increasing levels of average mental health symptomatology as age increases. Younger people are reported to have been most affected by the pandemic, both through reduced social interaction as well as being more vulnerable to employment changes, and the data suggests this group have the highest incidence of clinically significant depression and anxiety.

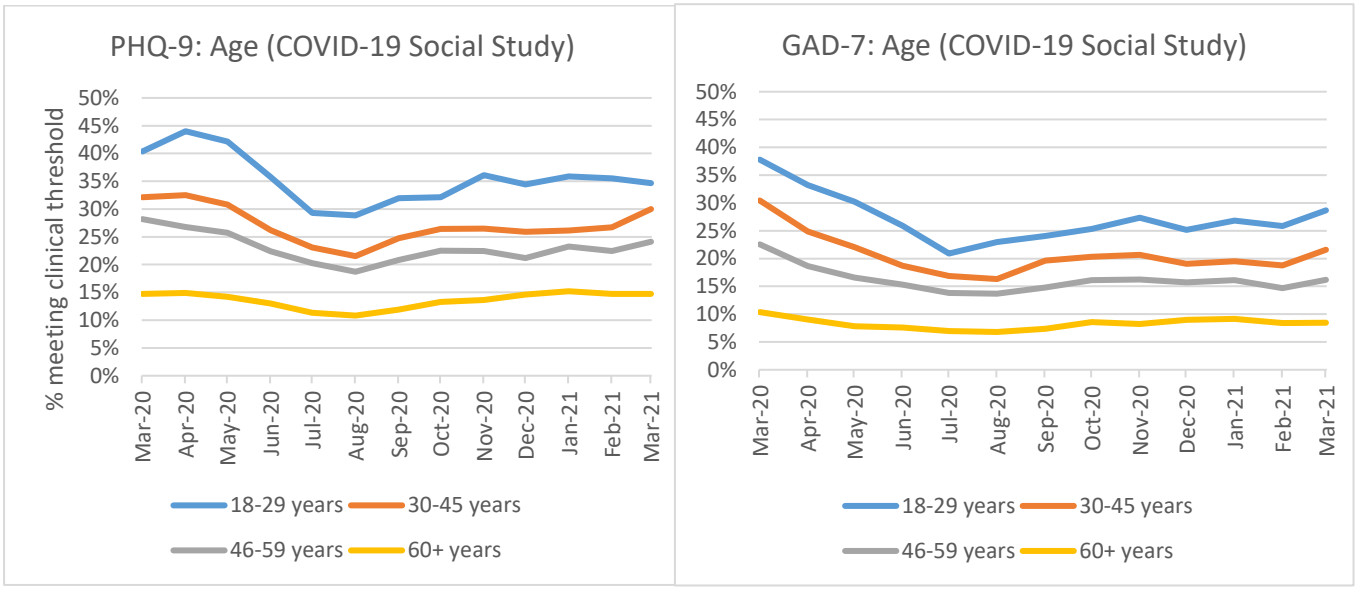

Figure 4: Proportion of participants by age group scoring above the clinical thresholds on the PHQ-9 and GAD-7. Source: the UCL COVID-19 Social Study (data accessed with permission from Dr Daisy Fancourt).

The number of referrals to an IAPT service in central London by age group is presented in figure 5 and shows that 25-45 year olds made up the majority of referrals both before and during the pandemic. The higher incidence of depression and anxiety in the general population for younger people has not been associated with an increased number of referrals to this IAPT service for this age group, as the trend appears constant for this group.

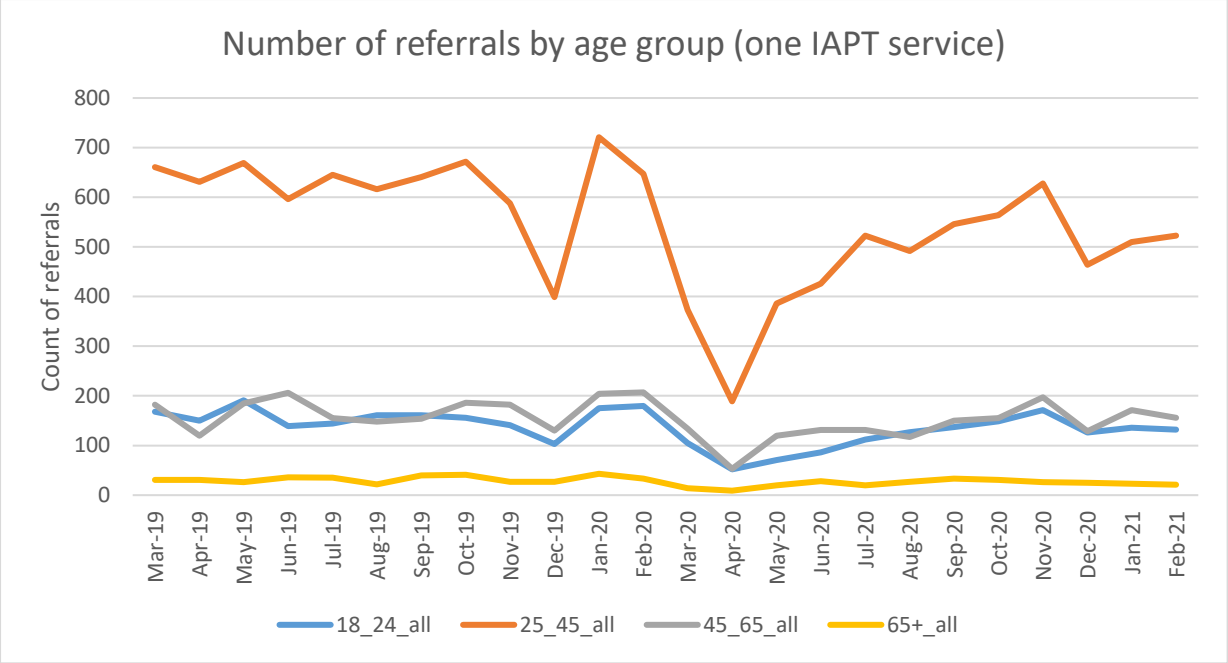

Figure 5. Count of monthly referrals to an IAPT March 2019 and Feb 2021 (data provided by the City & Hackney IAPT service).

Gender

The incidence of clinically significant depression and anxiety has been higher in women compared to men through the pandemic (figure 6). The likelihood of women reporting clinically significant anxiety was nearly double that of men in March 2020, but this difference has decreased during the pandemic.

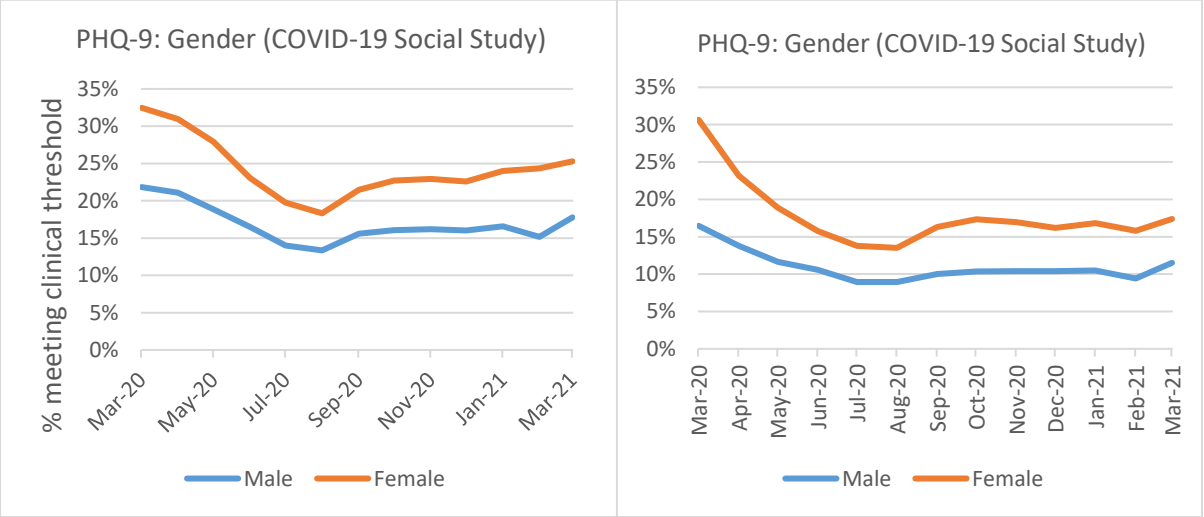

Figure 6: Proportion of participants by gender scoring above the clinical thresholds on the PHQ-9 and GAD-7. Source: the UCL COVID-19 Social Study (data accessed with permission from Dr Daisy Fancourt).

The rate of referrals to IAPT services between men and women has not differed during the pandemic. Data shows that around 70% of referrals were for women pre-COVID, and this proportion

has remained relatively constant through the pandemic, even in the months of reduced referrals (Figure 7).

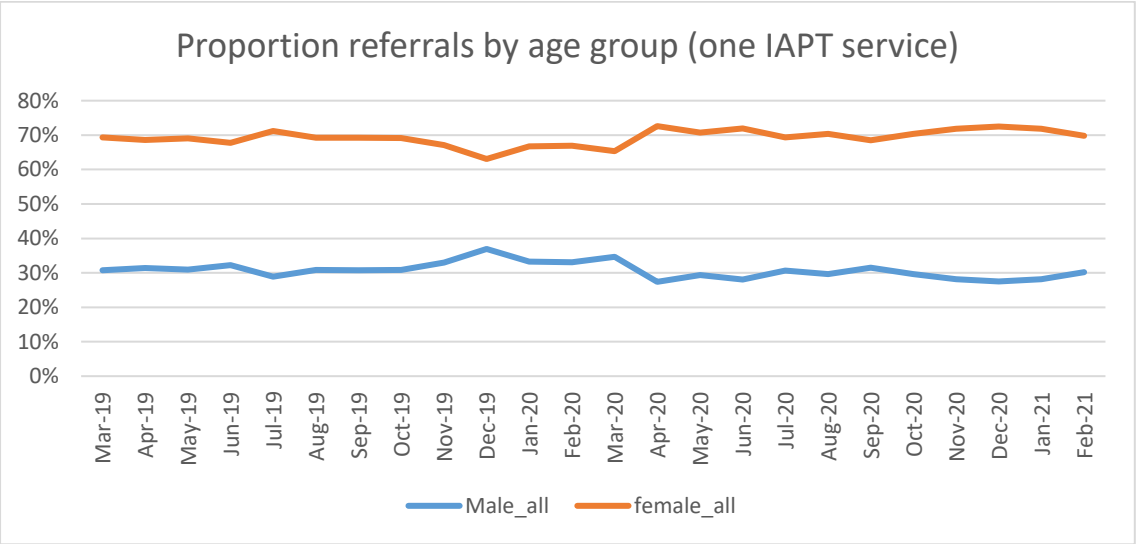

Figure 7. Proportion of male and female referrals to an IAPT between March 2019 and Feb 2021 (data provided by the City & Hackney IAPT service).

Ethnicity

People from Black and Minority Ethnic (BME) groups have also been identified as a potentially vulnerable group for both contracted COVID-19 but also associated impact on mental health and wellbeing. Data from the UCL COVID-19 Social Study indicates that the likelihood of scoring in the clinical range of the PHQ-9 and GAD-7 is higher in people from BME groups than white groups through the pandemic (figure 8).

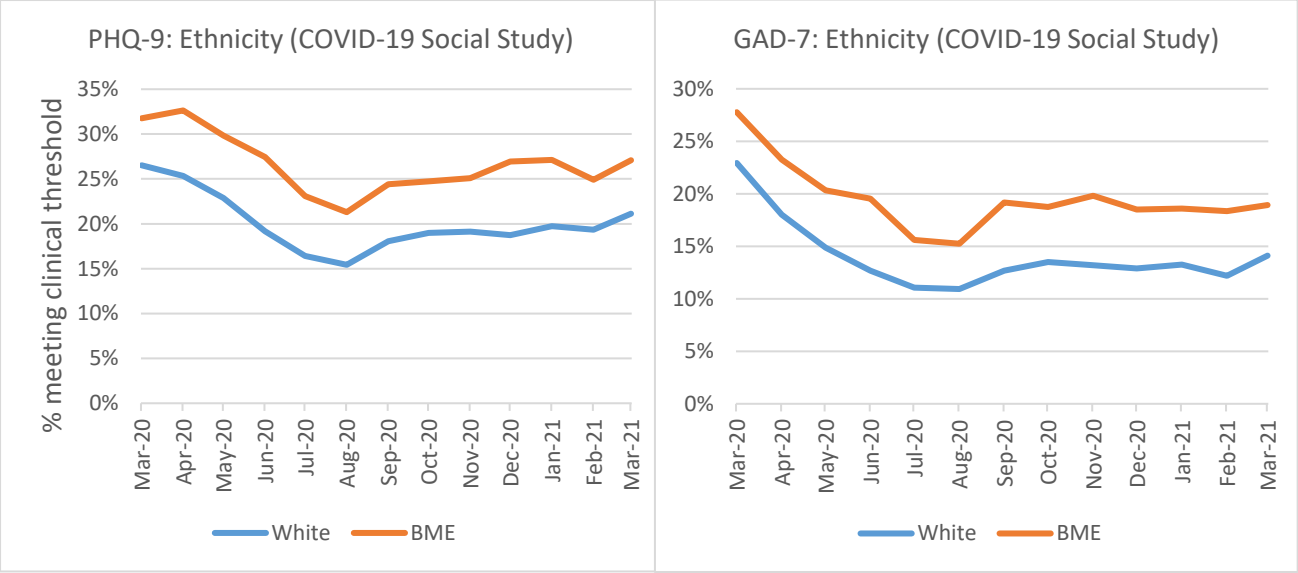

Figure 8: Proportion of participants by ethnicity group scoring above the clinical thresholds on the PHQ-9 and GAD-7. Source: the UCL COVID-19 Social Study (data accessed with permission from Dr Daisy Fancourt).

However, individuals from White ethnic groups still make up the majority of referrals to IAPT services. The proportion of referrals that are from BME groups has increased during the pandemic,

but this trend was observed pre-COVID (figure 9), and suggests that there has not be an observable increase for BME groups during the pandemic at this IAPT service.

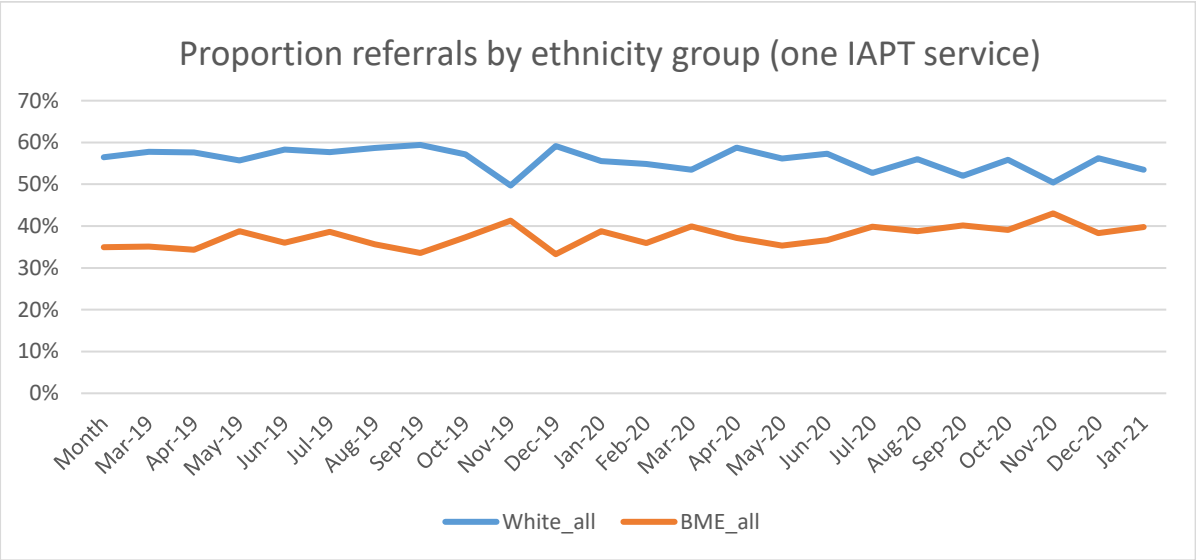

Figure 9. Proportion of White and BME referrals to an IAPT between March 2019 and Feb 2021 *(data provided by the City & Hackney IAPT service).*

Previously diagnosed mental health condition

Individuals who reported they had previously been diagnosed with a mental health condition were found to be more at risk of scoring in the range for clinically significant depression and anxiety throughout the pandemic using data from the COVID-19 Social Study. Figure 10 shows that over 50% of participants who self-reported having a mental health diagnosis scored above 10 on the PHQ-9 for the majority of the observed study period, and that 40% scored above the threshold on the GAD-7 for most months.

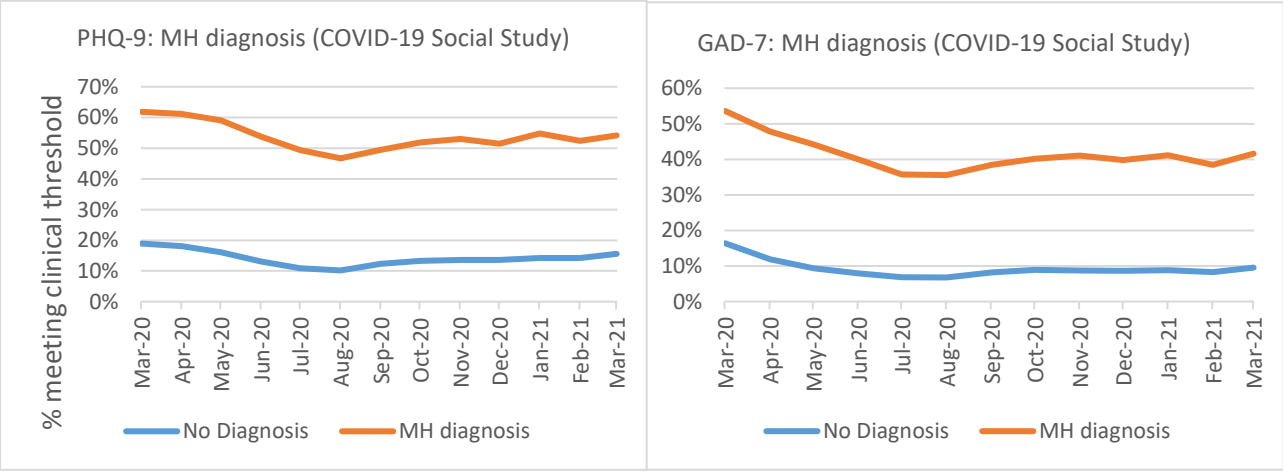

Figure 10: Proportion of participants by previous mental health diagnosis status scoring above the clinical thresholds on the PHQ-9 and GAD-7. Source: the UCL COVID-19 Social Study (data accessed with permission from Dr Daisy Fancourt).

As part of the COVID-19 social study, participants were asked an individual self-report question as to whether they thought their mental health was 'worse', 'the same' or 'better' during the first national lockdown compared to before. Whilst 29% of people without a previous mental health disorder said

their mental health was worse, 50% of participants who reported previous mental health diagnosis said their mental health was worse (see Table 1). Interestingly more participants with a previous diagnosis said their mental health was "better" (13%) than people without a diagnosis (7%). This may be because some individuals with an existing disorder such as social anxiety and/or with work-related stressors benefitted from the national lockdown and the reduced pressure of interacting with others or being in more stressful environments.

Table 1. Number of COVID-19 Social Study participants feeling their mental health was worse/same/better.

	n	Worse		Same		Better	
		n	%	n	%	n	%
Full Sample	29154	9587	33	17278	59	2289	8
No previous MH diagnosis	24346	7171	29	15510	64	1665	7
With previous MH Diagnosis	4808	2416	50	1768	37	624	13

Data from two IAPT services in London showed that the average GAD-7 scores of all patients in contact with the service increased in the first weeks of lockdown compared to the average over the previous three years, before returning to the same level as previous years (figure 11). The level of anxiety then appeared to increase slightly as lockdown restrictions were lifted towards the end of June[28]. Interestingly the average PHQ-9 score decreased in the first weeks of the initial lockdown for people in contact with the IAPT services, before returning to the same level as the previous years, and again increasing as restrictions were eased.

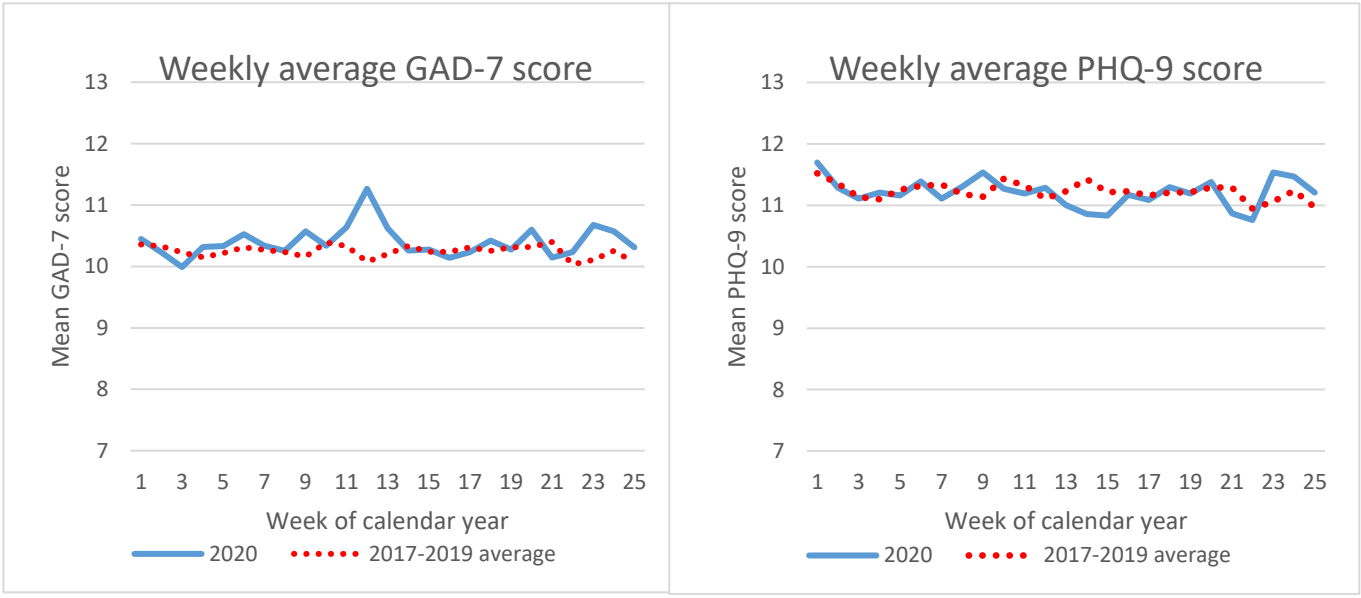

Figure 11. Average weekly GAD-7 and PHQ-9 scores in two IAPT services in London.

Health or social care workers

The incidence of clinically significant depression and anxiety between participants reporting they were health or social care workers is presented in figure 12. The likelihood of scoring 10 or more on the PHQ-9 and GAD-7 was around 3% and 2% higher in healthcare workers than non-healthcare

[28] Saunders, R., Buckman, J. E. J., Leibowitz, J., Cape, J., & Pilling, S.. (2021) Trends in depression & anxiety symptom severity in mental health service attendees during the COVID-19 pandemic. https://doi.org/10.31219/osf.io/eprqn

workers, respectively. A study conducted on ICU staff found that 40% of over 700 workers met criteria for PTSD, compared to 6% for severe depression and 11% for anxiety, suggesting this group may be at particular risk of trauma-related distress[29].

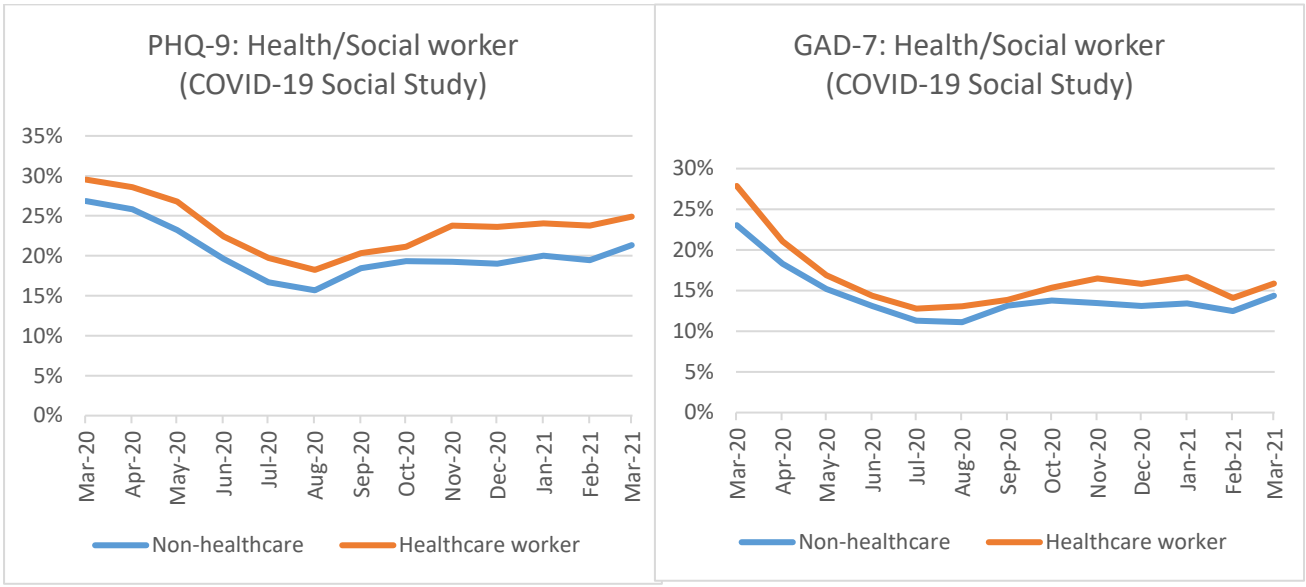

Figure 12: Proportion of participants by healthcare worker status scoring above the clinical thresholds on the PHQ-9 and GAD-7. Source: the UCL COVID-19 Social Study (data accessed with permission from Dr Daisy Fancourt).

[29] Greenberg, N, Weston, D….Fong, K. (2021). Mental health of staff working in intensive care during COVID-19, Occupational Medicine/ https://doi.org/10.1093/occmed/kqaa220

Other mental health disorders and young people

Owing to the lack of identified reviews of mental health disorders and symptoms other than CMDs, electronic searches were performed to identify any studies that have looked at other mental health disorders, including substance misuse, SMI and neurodevelopmental disorders.

Substance misuse

There is limited evidence available on the impact of the COVID-19 pandemic on drug and alcohol misuse. A cross-sectional[30] survey suggests that high risk drinking (Audit -C score 5+) has increased following the introduction of lockdown measures in March 2020 (25.1% versus 38.3%, OR = 1.85, CI = 1.67-2.06). A cohort study[31] of men aged 50 found high-risk drinking increased from 19.4% to 24.6% between 2016–2018 and May 2020, a statistically significant increase of 5.2 percentage points (95% CI=2.5, 8.0, p<0.001). Only one study in the UK with people who inject drugs was identified[32]. This cross-sectional unlinked anonymous survey found higher levels of cocaine (25% vs 17%; P = 0.011) and amphetamine (17% vs 11%; P = 0.034) injection in the last month compared to those who completed the 2019 survey. Survey respondents also reported greater difficulties accessing drug/alcohol services, equipment to safely inject drugs, substitute drug treatment and accessing blood-borne virus testing.

ADHD

A cross-sectional parent reported study completed in the UK[33] investigated the potential impact of the COVID-19 pandemic on the mental health of children and young people with a neurodevelopmental disorder compared a pre-COVID clinical mental health sample. Higher emotional symptoms, conduct problems and hyperactivity was reported in the post COVID group and lower prosocial behaviour. In a small cross-sectional survey[34] (N=24) of adults with ADHD, during the COVID-19 pandemic period the mean GAD-7 score (anxiety) was 4.84 (SD 1.46), the mean PHQ-9 score (depression) was 10.88 (SD 6.83).

Suicide/Self-harm/Abuse

An international, online cross-sectional survey completed March/April 2020 reported that the UK had lowest prevalence of suicidal ideation (0.7%), assessed with the PHQ[35]. The COVID-19 social study[36] found that 18% of participants in the survey reported experiencing thoughts of suicide or self-harm in the first month of lockdown in the UK. Around 60% of participants engaging in self-harm behaviours and 40% of participants with self-harm/suicidal thoughts or reporting abuse had accessed at least one type of formal or structured mental health support during the first month of lockdown (most commonly psychiatric medications). A large population-based cohort study[37] using

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[30] Jackson SE, Garnett C, Shahab L, Oldham M, Brown J. Association of the COVID-19 lockdown with smoking, drinking and attempts to quit in England: an analysis of 2019-20 data. Addiction. 2020;21:21.

[31] Daly M, Robinson E. High-Risk Drinking in Midlife Before Versus During the COVID-19 Crisis: Longitudinal Evidence From the United Kingdom. American Journal of Preventive Medicine. 2021;60(2):294-7.

[32] Croxford S, Emanuel E, Ibitoye A, Njoroge J, Edmundson C, Bardsley M, et al. Preliminary indications of the burden of COVID-19 among people who inject drugs in England and Northern Ireland and the impact on access to health and harm reduction services. Public Health. 2021;192:8-11.

[33] Nonweiler J, Rattray F, Baulcomb J, Happe F, Absoud M. Prevalence and Associated Factors of Emotional and Behavioural Difficulties during COVID-19 Pandemic in Children with Neurodevelopmental Disorders. Children. 2020;7(9):04.

[34] Adamou M, Fullen T, Galab N, Mackintosh I, Abbott K, Lowe D, et al. Psychological Effects of the COVID-19 Imposed Lockdown on Adults with Attention Deficit/Hyperactivity Disorder: Cross-Sectional Survey Study. JMIR Formative Research. 2020;4(12):e24430.

[35] Cheung T, Lam SC, Lee PH, Xiang YT, Yip PSF, International Research Collaboration on C. Global Imperative of Suicidal Ideation in 10 Countries Amid the COVID-19 Pandemic. Frontiers in psychiatry Frontiers Research Foundation. 2020;11:588781.

[36] Iob E, Steptoe A, Fancourt D. Abuse, self-harm and suicidal ideation in the UK during the COVID-19 pandemic. British Journal of Psychiatry. 2020;217(4):543-6.

[37] Carr MJ, Steeg S, Webb RT, Kapur N, Chew-Graham CA, Abel KM, et al. Effects of the COVID-19 pandemic on primary care-recorded mental illness and self-harm episodes in the UK: a population-based cohort study. The lancet Public Health. 2021;6(2):e124-e35.

electronic Primary Care records found the incidence of self-harm was 37·6% (34.8%–40.3%) lower than expected in April, 2020, and the reduction was greatest for women and individuals aged younger than 45 years. A retrospective cohort study using electronic patient records from 23 hospital emergency departments in 10 countries (including the UK)[38], emergency psychiatric hospital presentations decreased from 1239 in 2019 to 834 in 2020, incident rate ratio 0.67, 95% CI 0.62–0.73; $p < 0.001$. The proportion of children and adolescents presenting with self-harm increased from 50% in 2019 to 57% in 2020, odds ratio 1.33, 1.07–1.64; $p = 0.009$ but there was no difference in the proportion presenting with severe self-harm.

The COVID-19 Social Study[39] reported that 18% of those surveyed reported experiencing psychological or physical abuse and around 50% of these people experienced thoughts of suicide or self-harm, and 25% of them had engaged in self-harm behaviours during the previous week. Data collected on patients presenting with traumatic penetrating injuries at King's College Hospital in South London during the first lockdown period (23rd March – 29th April 2020) shows an overall drop in trauma presentations from 2018 (48 to 30). The number of trauma presentations due to interpersonal violence dropped from 46 in 2018 to 19 in 2020. Incidents of self-harm rose from 1 in 2018 to 8 in 2020[40].

Severe Mental Illness

There was a 40% reduction in the number of referrals in 2020 to an inpatient liaison psychiatry department in South London in the UK comparted to the same period in 2019. No evidence for high rates of new-onset acute mental illness was found[41]. Retrospective, electronic case record data from Leicestershire Partnership NHS Trust recording referrals to mental health services and admissions to psychiatric hospital reported that total admissions reduced from 315 pre-lockdown to 210 post lockdown. CAMHS, PICU and intellectual disabilities were exceptions to this, and small increases in admissions were seen. Statistically significant ($P < 0.05$) decreases in admissions were observed for acute mental health services for adults (pre-lockdown $n = 152$; lockdown $n = 121$), as well as MHSOP (pre-lockdown $n = 64$; lockdown $n = 47$). Total referrals to mental health services reduced from 7393 in the pre-lockdown period, to 4622 in the lockdown period. Referrals to all service types within Core AMH reduced significantly ($P < 0.05$), except the forensic service, where there was a slight increase (pre-lockdown $n = 51$; lockdown $n = 64$).

Chen et al. (2020)[42] completed an interrupted time series study using electronic clinical records data from of Cambridgeshire and Peterborough NHS Foundation Trust. There was a drop in mental health referrals following the initial COVID-19 lockdown but then a longer-term increase in the referral rate (by 1.21 referrals per day per day, 95% confidence interval [CI] 0.41–2.02). This increase was primarily for urgent or emergency referrals (0.96, CI 0.39–1.54), including referrals to liaison psychiatry (0.68, CI 0.35–1.02) and mental health crisis teams (0.61, CI 0.20–1.02). The increase was

[38] Ougrin D, Wong BHC, Vaezinejad M, Plener PL, Mehdi T, Romaniuk L, et al. Pandemic-related emergency psychiatric presentations for self-harm of children and adolescents in 10 countries (PREP-kids): a retrospective international cohort study. European Child and Adolescent Psychiatry. 2021.

[39] Iob E, Steptoe A, Fancourt D. Abuse, self-harm and suicidal ideation in the UK during the COVID-19 pandemic. British Journal of Psychiatry. 2020;217(4):543-6.

[40] Olding J, Zisman S, Olding C, Fan K. Penetrating trauma during a global pandemic: Changing patterns in interpersonal violence, self-harm and domestic violence in the Covid-19 outbreak. Surgeon Journal of the Royal Colleges of Surgeons of Edinburgh & Ireland. 2021;19(1):e9-e13.

[41] Butler M, Delvi A, Mujic F, Broad S, Pauli L, Pollak TA, et al. Reduced Activity in an Inpatient Liaison Psychiatry Service During the First Wave of the COVID-19 Pandemic: Comparison With 2019 Data and Characterization of the SARS-CoV-2 Positive Cohort. Frontiers in psychiatry Frontiers Research Foundation. 2021;12:619550.

[42] Chen, S., She, R., … & Cardinal, R. N. (2020). The Medium-Term Impact of COVID-19 Lockdown on Referrals to Secondary Care Mental Health Services: A Controlled Interrupted Time Series Study. Frontiers in psychiatry, 11, 585915. https://doi.org/10.3389/fpsyt.2020.585915

significant for females (0.56, CI 0.04–1.08), males (0.64, CI 0.05–1.22), working-age adults (0.93, CI 0.42–1.43), people of White ethnicity (0.98, CI 0.32–1.65), those living alone (1.26, CI 0.52–2.00), and those who had pre-existing depression (0.78, CI 0.19–1.38), severe mental illness (0.67, CI 0.19–1.15), hypertension/cardiovascular/cerebrovascular disease (0.56, CI 0.24–0.89), personality disorders (0.32, CI 0.12–0.51), asthma/chronic obstructive pulmonary disease (0.28, CI 0.08–0.49), dyslipidemia (0.26, CI 0.04–0.47), anxiety (0.21, CI 0.08–0.34), substance misuse (0.21, CI 0.08–0.34), or reactions to severe stress (0.17, CI 0.01–0.32). No significant post-lockdown increase was observed for children/adolescents, older adults, people of ethnic minorities, married/cohabiting people, and those who had previous/pre-existing dementia, diabetes, cancer, eating disorder, a history of self-harm, or intellectual disability. An additional study found observable decreases in the number of referrals to secondary adult mental health services, as well as to intellectual disability services following lockdown which was below pre-pandemic levels by the middle of May 2020[43]. The number of absolute admissions was small in the dataset but indicated that there was a sharp decrease in the first weeks of lockdown, which returned to the same level within the following 6 to 8 weeks.

Children and Young People

The available research on the impact of COVID-19 on children and young people's mental health in the UK presents a mixed picture[44]. UK based parents and carers of school aged children and young people aged between 4 and 16 completed an online survey at two time points between March and May 2020. For children aged 4-10, there were increases in caseness for emotional symptoms and hyperactivity/inattention. The proportion of adolescents classified as a case did not change significantly for emotional symptoms, conduct problems, or hyperactivity/ inattention[45]. A UK population-based birth cohort of children aged 11-12 and their mothers collected data between December 2019 and March 2020 and again 3 months after lockdown. Children reported a 44% increase in their symptoms of depression (p<·001), and a 26% increase in PTSD symptoms[46]. An ongoing NIHR survey study found that amongst students aged 13-14 (n=1047), there was an overall decrease in the proportion of students at risk of anxiety during lockdown, with girls' falling from 54% to 45% and boys from 26% to 18%, compared to pre-lockdown. There was a small increase in girls at risk of depression from 31% pre-pandemic to 34% during lockdown, but a small decrease in boys at risk of depression from 21% pre-pandemic to 19% during lockdown[47]. Referrals to Child and Adolescent services showed a limited decrease over the observed time period in a study exploring the first 8 weeks of lockdown[43].

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[43] Tromans, S., Chester, V., Harrison, H., Pankhania, P., Booth, H., & Chakraborty, N. (2020). Patterns of use of secondary mental health services before and during COVID-19 lockdown: Observational study. BJPsych Open, 6(6), E117. https://doi.org/10.1192/bjo.2020.104

[44] https://emergingminds.org.uk/wp-content/uploads/2021/03/01-Gayer-Anderson.pdf

[45] Waite P, Pearcey S, Shum A, Raw J, Patalay P, Creswell C. How did the mental health of children and adolescents change during early lockdown during the COVID-19 pandemic in the UK?.

[46] Wright N, Hill J, Sharp H, Pickles A. Impact of COVID-19 on Young Adolescent Mental Health: Comparison of Depression, Anxiety and Behaviour Problems in 12 Year Olds Immediately Before and During the Pandemic in a UK Birth Cohort. Anxiety and Behaviour Problems in. 2020 Oct 26;12.

[47] Widnall E, Winstone L, Mars B, Haworth C, Kidger J. Young people's mental health during the COVID-19 pandemic: Initial findings from a secondary school survey study in South West England. National Institute for Health Research School for Public Health Research. 2020.

Appendices

Table A1: OVID Medline search strategy

1	EATING DISORDERS/ or ANOREXIA NERVOSA/ or BINGE-EATING DISORDER/ or BULIMIA NERVOSA/ or FEMALE ATHLETE TRIAD SYNDROME/ or PICA/
2	HYPERPHAGIA/ or BULIMIA/
3	SELF-INJURIOUS BEHAVIOR/ or SELF MUTILATION/ or SUICIDE/ or SUICIDAL IDEATION/ or SUICIDE, ATTEMPTED/
4	MOOD DISORDERS/ or AFFECTIVE DISORDERS, PSYCHOTIC/ or BIPOLAR DISORDER/ or CYCLOTHYMIC DISORDER/ or DEPRESSIVE DISORDER/ or DEPRESSION, POSTPARTUM/ or DEPRESSIVE DISORDER, MAJOR/ or DEPRESSIVE DISORDER, TREATMENT-RESISTANT/ or DYSTHYMIC DISORDER/ or SEASONAL AFFECTIVE DISORDER/
5	NEUROTIC DISORDERS/
6	DEPRESSION/
7	ADJUSTMENT DISORDERS/
8	ANXIETY DISORDERS/ or AGORAPHOBIA/ or NEUROCIRCULATORY ASTHENIA/ or OBSESSIVE-COMPULSIVE DISORDER/ or OBSESSIVE HOARDING/ or PANIC DISORDER/ or PHOBIC DISORDERS/ or STRESS DISORDERS, TRAUMATIC/ or COMBAT DISORDERS/ or STRESS DISORDERS, POST-TRAUMATIC/ or STRESS DISORDERS, TRAUMATIC, ACUTE/
9	ANXIETY/ or ANXIETY, CASTRATION/ or KORO/
10	ANXIETY, SEPARATION/
11	PANIC/
12	SOMATOFORM DISORDERS/ or BODY DYSMORPHIC DISORDERS/ or CONVERSION DISORDER/ or HYPOCHONDRIASIS/ or NEURASTHENIA/
13	HYSTERIA/
14	MUNCHAUSEN SYNDROME BY PROXY/ or MUNCHAUSEN SYNDROME/
15	FATIGUE SYNDROME, CHRONIC/
16	OBSESSIVE BEHAVIOR/
17	COMPULSIVE BEHAVIOR/ or BEHAVIOR, ADDICTIVE/
18	IMPULSE CONTROL DISORDERS/ or FIRESETTING BEHAVIOR/ or GAMBLING/ or TRICHOTILLOMANIA/
19	STRESS, PSYCHOLOGICAL/ or BURNOUT, PROFESSIONAL/
20	SEXUAL DYSFUNCTIONS, PSYCHOLOGICAL/ or VAGINISMUS/
21	ANHEDONIA/
22	AFFECTIVE SYMPTOMS/
23	Exp *MENTAL DISORDERS/
24	Exp substance-related disorders/
25	Attention Deficit Disorder with hyperactivity/
26	Exp Autism spectrum disorder/
27	Conduct disorder/
28	Learning disabilities/
29	Intellectual disability/
30	Schizophrenia/ or psychotic disorders/
31	Dementia/
32	(eating disorder* or anorexia nervosa or bulimi* or binge eat*).ti,ab.
33	((self adj (injur* or mutilat*)) or suicide* or suicidal or parasuicid*).ti,ab
34	(mood disorder* or affective disorder* or bipolar i or bipolar ii or (bipolar and (affective or disorder*)) or mania or manic or cyclothymic* or depression or depressive or dysthymi* or neurotic or neurosis or adjustment disorder* or antidepress*).ti,ab

35	(anxiety disorder* or agoraphobia or obsess* or compulsi* or panic or phobi* or ptsd or posttrauma* or post trauma* or combat or somatoform or somati#ation).ti,ab
36	(body dysmorphi* or conversion disorder or hypochondria* or neurastheni* or hysteria or munchausen or chronic fatigue* or gambling or trichotillomania or vaginismus or anhedoni*).ti,ab
37	(affective symptoms or mental disorder* or mental health).ti,ab
38	(Schizophreni* or psycho* or sever* mental* ill*).ti,ab
39	(alcohol depend* or alcohol* or addict*).ti,ab
40	(drug dependen* or drug abuse* or drug addict*).ti,ab.
41	(Attention deficit hyperactivity disorder* or Attention deficit disorder* or ADHD or conduct disorder).ti,ab.
42	(Autis* or autism spectrum disorder or Asperg*).ti,ab
43	(Learning disab* or learning disorder* or intellectual disab*).ti,ab
44	(Dementia or alzheimer*).ti,ab
45	or/1-44
46	(coronavirus OR corona virus OR coronavirinae OR coronaviridae OR betacoronavirus OR covid19 OR covid 19 OR nCoV OR CoV 2 OR CoV2 OR sarscov2 OR 2019nCoV OR novel CoV OR wuhan virus).ti,ab.
47	((wuhan OR hubei OR huanan) AND (severe acute respiratory OR pneumonia) AND (outbreak)).ti,ab.
48	Coronavirus/ OR Coronavirus Infections/ OR COVID-19/ OR severe acute respiratory syndrome coronavirus 2/ OR Betacoronavirus/
49	OR/46-48
50	Systematic review/ or systematic review.ti,ab,pt
51	Meta-analysis/ or meta-analysis.ti,ab,pt.
52	OR/50-51
53	prevalence/ or morbidity/ or incidence/ or (prevalen* or incidence or morbidity or trend or change).ti,ab.
54	AND/45,49,52,53
55	Limit 54 to dt=20191201-20210312
56	Limit 55 to English language

Table A2: OVID EMBASE search strategy

1	EATING DISORDER/ or ANOREXIA NERVOSA/ or BINGE EATING DISORDER/ or BULIMIA/ or FEMALE ATHLETE TRIAD/ or FOOD AVERSION/ or PICA/
2	Self mutilation/
3	SUICIDAL BEHAVIOR/ or SELF POISONING/ or SUICIDAL IDEATION/ or SUICIDE/ or SUICIDE ATTEMPT/
4	MANIA/ or HYPOMANIA/ or MANIC PSYCHOSIS/
5	BIPOLAR DISORDER/ or BIPOLAR DEPRESSION/ or BIPOLAR I DISORDER/ or BIPOLAR II DISORDER/ or BIPOLAR MANIA/ or CYCLOTHYMIA/ or MANIC DEPRESSIVE PSYCHOSIS/ or "MIXED MANIA and DEPRESSION"/ or RAPID CYCLING BIPOLAR DISORDER/
6	DEPRESSION/ or AGITATED DEPRESSION/ or ATYPICAL DEPRESSION/ or DEPRESSIVE PSYCHOSIS/ or DYSPHORIA/ or DYSTHYMIA/ or ENDOGENOUS DEPRESSION/ or INVOLUTIONAL DEPRESSION/ or MAJOR DEPRESSION/ or MASKED DEPRESSION/ or MELANCHOLIA/ or "MIXED ANXIETY and DEPRESSION"/ or "MIXED DEPRESSION AND DEMENTIA"/ or MOURNING SYNDROME/ or ORGANIC DEPRESSION/ or POSTOPERATIVE DEPRESSION/ or PREMENSTRUAL DYSPHORIC DISORDER/ or PSEUDODEMENTIA/ or PUERPERAL DEPRESSION/ or REACTIVE DEPRESSION/ or RECURRENT BRIEF DEPRESSION/ or SEASONAL AFFECTIVE DISORDER/
7	Psychotic disorders/
8	NEUROSIS/ or AFFECTIVE NEUROSIS/ or ANXIETY NEUROSIS/ or DYSTHYMIA/ or HYSTERIA/ or NEURASTHENIA/ or PSYCHASTHENIA/
9	ADJUSTMENT DISORDERS/
10	ANXIETY/
11	ANXIETY DISORDER/ or ACUTE STRESS DISORDER/ or ANXIETY NEUROSIS/ or CARDIAC ANXIETY/ or DISTRESS SYNDROME/ or GENERALIZED ANXIETY DISORDER/ or KORO/ or "MIXED ANXIETY and DEPRESSION"/ or PANIC/ or POSTTRAUMATIC STRESS DISORDER/ or PSYCHASTHENIA/ or SEPARATION ANXIETY/
12	OBSESSIVE COMPULSIVE DISORDER/ or COMPULSION/ or OBSESSION/
13	PHOBIA/ or AGORAPHOBIA/ or CLAUSTROPHOBIA/ or HOMOPHOBIA/ or NEOPHOBIA/ or SOCIAL PHOBIA/
14	SOMATOFORM DISORDER/ or BODY DYSMORPHIC DISORDER/ or CARDIAC ANXIETY/ or CONVERSION DISORDER/ or DELUSIONAL PREGNANCY/ or HYPOCHONDRIASIS/ or MASKED DEPRESSION/ or PSYCHOGENIC PAIN/ or SOMATIC DELUSION/ or SOMATIZATION/
15	MOOD DISORDER/ or AFFECTIVE NEUROSIS/ or AFFECTIVE PSYCHOSIS/ or BLUNTED AFFECT/ or MAJOR AFFECTIVE DISORDER/ or MINOR AFFECTIVE DISORDER/
16	MUNCHAUSEN SYNDROME BY PROXY/ or MUNCHAUSEN SYNDROME/
17	PSYCHOSEXUAL DISORDER/ or ANORGASMIA/ or CASTRATION ANXIETY/ or FRIGIDITY/ or KORO/ or LIBIDO DISORDER/ or OEDIPUS COMPLEX/ or ORGASM DISORDER/ or PSYCHOGENIC IMPOTENCE/ or SEXUAL ADDICTION/ or SEXUAL AROUSAL DISORDER/ or VAGINISM/
18	IMPULSE CONTROL DISORDER/ or INTERMITTENT EXPLOSIVE DISORDER/ or KLEPTOMANIA/ or PATHOLOGICAL GAMBLING/ or PYROMANIA/ or TRICHOTILLOMANIA/
19	Mental stress/ or emotional disorder/
20	Schizophrenia/ or psychosis/ or (schizophren* or psycho* or severe* mental* ill*).ti,ab
21	Exp drug dependence/
22	Attention deficit disorder/
23	Autism/
24	Conduct disorder/
25	Learning disorder/
26	Intellectual impairment/

27	Dementia/
28	eating disorder* or anorexia nervosa or bulimi* or binge eat*.ti,ab.
29	((self adj (injur* or mutilat*)) or suicide* or suicidal or parasuicid*).ti,ab
30	(mood disorder* or affective disorder* or bipolar i or bipolar ii or (bipolar and (affective or disorder*)) or mania or manic or cyclothymic* or depression or depressive or dysthymi* or neurotic or neurosis or adjustment disorder* or antidepress*).ti,ab
31	(anxiety disorder* or agoraphobia or obsess* or compulsi* or panic or phobi* or ptsd or posttrauma* or post trauma* or combat or somatoform or somati#ation).ti,ab
32	(body dysmorphi* or conversion disorder or hypochondria* or neurastheni* or hysteria or munchausen or chronic fatigue* or gambling or trichotillomania or vaginismus or anhedoni*).ti,ab
33	(affective symptoms or mental disorder* or mental health).ti,ab
34	(alcohol dependen* or alcohol* or addict*).ti,ab
35	(drug dependen* or drug abuse* or addict*)).ti,ab
36	(Attention deficit hyperactivity disorder* or Attention deficit disorder* or ADHD or conduct disorder).ti,ab.
37	(Autis* or autism spectrum disorder or Asperg*).ti,ab
38	(Learning disab* or learning disorder* or intellectual disab*).ti,ab
39	(Dementia or alzheimer*).ti,ab
40	or/1-39
41	**(coronavirus OR corona virus OR coronavirinae OR coronaviridae OR betacoronavirus OR covid19 OR covid 19 OR nCoV OR CoV 2 OR CoV2 OR sarscov2 OR 2019nCoV OR novel CoV OR wuhan virus).ti,ab.**
42	**((wuhan OR hubei OR huanan) AND (severe acute respiratory OR pneumonia) AND (outbreak)).ti,ab.**
43	**Coronavirinae/ OR Coronavirus Infection/ OR Betacoronavirus/ OR severe acute respiratory infection/**
44	OR/41-43
45	Systematic review/ or systematic review.ti,ab,pt.
46	Meta analysis/ or meta-analysis.ti,ab,pt.
47	OR/45-46
48	prevalence/ or morbidity/ or incidence/ or (prevalen* or incidence or morbidity or trend or change).ti,ab.
49	AND/40,44,47,48
50	Limit 49 to dd=20191201-20210312
51	Limit 50 to English language

Table A3: OVID PsycInfo search strategy

1	EATING DISORDERS/ or ANOREXIA NERVOSA/ or BULIMIA/ or HYPERPHAGIA/ or KLEINE LEVIN SYNDROME/ or PICA/ or "PURGING (EATING DISORDERS)"/
2	APHAGIA/
3	COPROPHAGIA/
4	BINGE EATING/
5	SELF DESTRUCTIVE BEHAVIOR/ or ATTEMPTED SUICIDE/ or HEAD BANGING/ or SELF INFLICTED WOUNDS/ or SELF INJURIOUS BEHAVIOR/ or SELF MUTILATION/ or SUICIDE/
6	SUICIDE PREVENTION/
7	SUICIDAL IDEATION/
8	AFFECTIVE DISORDERS/
9	AFFECTIVE PSYCHOSIS/
10	BIPOLAR DISORDER/ or CYCLOTHYMIC PERSONALITY/
11	MAJOR DEPRESSION/ or ANACLITIC DEPRESSION/ or DYSTHYMIC DISORDER/ or ENDOGENOUS DEPRESSION/ or POSTPARTUM DEPRESSION/ or REACTIVE DEPRESSION/ or RECURRENT DEPRESSION/ or TREATMENT RESISTANT DEPRESSION/
12	ATYPICAL DEPRESSION/
13	"DEPRESSION (EMOTION)"/
14	SEASONAL AFFECTIVE DISORDER/
15	ANXIETY DISORDERS/ or ACUTE STRESS DISORDER/ or CASTRATION ANXIETY/ or DEATH ANXIETY/ or GENERALIZED ANXIETY DISORDER/ or OBSESSIVE COMPULSIVE DISORDER/ or PANIC DISORDER/ or POSTTRAUMATIC STRESS DISORDER/ or SEPARATION ANXIETY/
16	PHOBIAS/ or ACROPHOBIA/ or AGORAPHOBIA/ or CLAUSTROPHOBIA/ or OPHIDIOPHOBIA/ or SCHOOL PHOBIA/ or SOCIAL PHOBIA/
17	"DEBRIEFING (PSYCHOLOGICAL)"/
18	NEUROSIS/ or CHILDHOOD NEUROSIS/ or EXPERIMENTAL NEUROSIS/ or OCCUPATIONAL NEUROSIS/ or TRAUMATIC NEUROSIS/
19	ADJUSTMENT DISORDERS/
20	COPING BEHAVIOR/
21	ADJUSTMENT/ or EXP EMOTIONAL ADJUSTMENT/ or OCCUPATIONAL ADJUSTMENT/ or SCHOOL ADJUSTMENT/ or SOCIAL ADJUSTMENT/
22	EMOTIONAL TRAUMA/
23	STRESS/ or CHRONIC STRESS/ or ENVIRONMENTAL STRESS/ or OCCUPATIONAL STRESS/ or PSYCHOLOGICAL STRESS/ or SOCIAL STRESS/ or STRESS REACTIONS/
24	ANXIETY/ or COMPUTER ANXIETY/ or MATHEMATICS ANXIETY/ or PERFORMANCE ANXIETY/ or SOCIAL ANXIETY/ or SPEECH ANXIETY/ or TEST ANXIETY/
25	PANIC ATTACK/ or PANIC/ or PANIC DISORDER/
26	SOMATOFORM DISORDERS/ or BODY DYSMORPHIC DISORDER/ or HYPOCHONDRIASIS/ or NEURASTHENIA/ or NEURODERMATITIS/ or SOMATIZATION DISORDER/ or SOMATOFORM PAIN DISORDER/
27	CONVERSION DISORDER/ or HYSTERICAL PARALYSIS/ or HYSTERICAL VISION DISTURBANCES/ or PSEUDOCYESIS/
28	SOMATIZATION/

29	HYSTERIA/ OR MASS HYSTERIA/
30	HYSTERICAL PARALYSIS/
31	HISTRIONIC PERSONALITY DISORDER/
32	MALINGERING/
33	FACTITIOUS DISORDERS/ or MUNCHAUSEN SYNDROME BY PROXY/ or MUNCHAUSEN SYNDROME/
34	CHRONIC FATIGUE SYNDROME/
35	COMPULSIONS/ OR REPETITION COMPULSION/
36	OBSESSIONS/
37	OBSESSIVE COMPULSIVE PERSONALITY DISORDER/
38	TRICHOTILLOMANIA/
39	GAMBLING/ or PATHOLOGICAL GAMBLING/
40	SEXUAL FUNCTION DISTURBANCES/ or DYSPAREUNIA/ or ERECTILE DYSFUNCTION/ or FEMALE SEXUAL DYSFUNCTION/ or INHIBITED SEXUAL DESIRE/ or PREMATURE EJACULATION/ or VAGINISMUS/
41	PREMENSTRUAL DYSPHORIC DISORDER/
42	*MENTAL DISORDERS/
43	Psychosis/ or schizophrenia/
44	Alcoholism/ or alcohol abuse/ or “substance use disorder”/
45	Attention deficit disorder with hyperactivity/
46	Autism spectrum disorders/
47	Conduct disorder/
48	Learning disabilities/
49	Intellectual development disorder/
50	Dementia/
51	(eating disorder* or anorexi* or bulimi* or binge eat*).ti,ab
52	(self adj (injur* or mutilat*) or suicide* or suicidal or parasuicid*).ti,ab
53	(mood disorder* or affective disorder* or bipolar i or bipolar ii or (bipolar and (affective or disorder*)) or mania or manic or cyclothymi* or depression or depressive or dysthymi*).ti,ab
54	(neurotic or neurosis or adjustment disorder* or antidepress* or anxiety disorder* or agoraphobia).ti,ab.
55	(obsess* or compulsi* or panic or phobi*).ti,ab
56	(ptsd or posttrauma* or post trauma* or combat).ti,ab
57	(somatoform or somati#ation or medical* unexplained or body dysmorphi* or conversion disorder or hypochondria* or neurastheni*).ti,ab.
58	(hysteria or munchausen or chronic fatigue* or gambling or trichotillomania or vaginismus or anhedoni* or affective symptoms or mental disorder* or mental health).ti,ab.
59	(alcohol depend* or alcohol* or addict*).ti,ab
60	(drug depend* or drug abuse* or drug addict*).ti,ab
61	(Attention deficit hyperactivity disorder* or Attention deficit disorder* or ADHD or conduct disorder).ti,ab.
62	(Autis* or autism spectrum disorder or Asperg*).ti,ab
63	(Learning disab* or learning disorder* or intellectual disab*).ti,ab

64	(Dementia or alzheimer*).ti,ab
65	or/1-64
66	(coronavirus OR corona virus OR coronavirinae OR coronaviridae OR betacoronavirus OR covid19 OR covid 19 OR nCoV OR CoV 2 OR CoV2 OR sarscov2 OR 2019nCoV OR novel CoV OR wuhan virus).ti,ab.
67	((wuhan OR hubei OR huanan) AND (severe acute respiratory OR pneumonia) AND (outbreak)).ti,ab.
68	Coronavirus/ OR severe acute respiratory syndrome/
69	OR/66-68
70	Systematic review/ or systematic review.ti,ab,pt. Or review.ti,ab
71	Meta-analysis/ or meta-analysis.ti,ab,pt
72	OR/70-71
73	epidemiology/ or morbidity/ or (prevalen* or incidence or morbidity or trend or change).ti,ab.
74	AND/65,69,72,73
75	Limit 74 to up=20191201-20210312
76	Limit 75 to English language

Table A4: CINAHL search strategy

1	MH EATING DISORDERS or MH ANOREXIA NERVOSA or MH BINGE EATING DISORDER or MH BULIMIA NERVOSA or MH FEMALE ATHLETE TRIAD or MH PICA
2	MH HYPERPHAGIA
3	MH SELF-INJURIOUS BEHAVIOR or MH SUICIDE or MH SUICIDAL IDEATION or MH SUICIDE, ATTEMPTED
4	MH AFFECTIVE DISORDERS, MH PSYCHOTIC or MH BIPOLAR DISORDER or MH CYCLOTHYMIC DISORDER or MH DEPRESSION, POSTPARTUM or MH DYSTHYMIC DISORDER or MH SEASONAL AFFECTIVE DISORDER
5	MH NEUROTIC DISORDERS
6	MH DEPRESSION
7	MH ADJUSTMENT DISORDERS
8	MH ANXIETY DISORDERS or MH AGORAPHOBIA or MH ASTHENIA or MH OBSESSIVE-COMPULSIVE DISORDER or MH OBSESSIVE HOARDING or MH PANIC DISORDER or MH PHOBIC DISORDERS or MH STRESS DISORDERS, POST-TRAUMATIC
9	MH ANXIETY
10	MH SEPARATION ANXIETY
11	MH SOMATOFORM DISORDERS or MH BODY DYSMORPHIC DISORDER or MH HYPOCHONDRIASIS
12	MH HYSTERIA
13	MH MUNCHAUSEN SYNDROME BY PROXY or MH MUNCHAUSEN SYNDROME
14	MH FATIGUE SYNDROME, CHRONIC
15	MH COMPULSIVE BEHAVIOR or MH BEHAVIOR, ADDICTIVE
16	MH IMPULSE CONTROL DISORDERS or MH GAMBLING or MH TRICHOTILLOMANIA
17	MH STRESS, PSYCHOLOGICAL or MH BURNOUT, PROFESSIONAL
18	MH PSYCHOSEXUAL DISORDERS
19	MH ANHEDONIA
20	MH AFFECTIVE SYMPTOMS
21	MH MENTAL DISORDERS+
22	MH substance USE disorders+
23	MH Attention Deficit hyperactivity disorder
24	MH AUTISTIC DISORDER or MH ASPERGER SYNDROME
25	MH Learning disorders
26	MH Intellectual disability
27	MH Schizophrenia or MH psychotic disorders
28	MH Dementia
29	(“eating disorder*” or “anorexia nervosa” or bulimi* or “binge eat*”)
30	((self w1 (injur* or mutilat*)) or suicide* or suicidal or parasuicid*)
31	(“mood disorder*” or “affective disorder*” or “bipolar I” or “bipolar ii” or (bipolar and (affective or disorder*)) or mania or manic or cyclothymic* or depression or depressive or dysthymi* or neurotic or neurosis or adjustment disorder* or antidepress*)
32	(“anxiety disorder*” or agoraphobia or obsess* or compulsi* or panic or phobi* or ptsd or posttrauma* or “post trauma*” or combat or somatoform or somati#ation)
33	(“body dysmorphi*” or “conversion disorder” or hypochondria* or neurastheni* or hysteria or munchausen or chronic fatigue* or gambling or trichotillomania or vaginismus or anhedoni*)
34	(“affective symptoms” or “mental disorder*” or “mental health”)

35	Schizophreni* or psycho* or “sever* mental* ill*”
36	“alcohol depend*” or alcohol* or addict*
37	“drug dependen*” or “drug abuse*” or “drug addict*”
38	“Attention deficit hyperactivity disorder*” or “Attention deficit disorder*” or ADHD or “conduct disorder”
39	Autis* or “autism spectrum disorder” or Asperg*
40	“Learning disab*” or “learning disorder*” or “intellectual disab*”
41	Dementia or alzheimer*
42	S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9 OR S10 OR S11 OR S12 OR S13 OR S14 OR S15 OR S16 OR S17 OR S18 OR S19 OR S20 OR S21 OR S22 OR S23 OR S24 OR S25 OR S26 OR S27 OR S28 OR S29 OR S30 OR S31 OR S32 OR S33 OR S34 OR S35 OR S36 OR S37 OR S38 OR S39 OR S40 OR S41
43	**coronavirus OR “corona virus” OR coronavirinae OR coronaviridae OR betacoronavirus OR covid19 OR “covid 19” OR nCoV OR “CoV 2” OR CoV2 OR sarscov2 OR 2019nCoV OR novel CoV OR “wuhan virus”**
44	**(wuhan OR hubei OR huanan) AND (“severe acute respiratory” OR pneumonia) AND (outbreak)**
45	**MH Coronavirus OR MH Coronavirus Infections OR MH COVID-19**
46	S43 OR S44 OR S45
47	MH Systematic review or “systematic review” or “rapid review” or “umbrella review”
48	MH Meta-analysis or meta-analysis
49	S47 OR S48
50	S42 AND S46 AND S49
51	EM 20191201-20210312
52	S50 AND S51

Table A5: COCHRANE library search strategy

1	MeSH descriptor EATING DISORDERS explode all trees
2	MeSH descriptor BULIMIA this term only
3	MeSH descriptor SELF-INJURIOUS BEHAVIOR this term only
4	MeSH descriptor SELF MUTILATION this term only
5	MeSH descriptor SUICIDE this term only
6	Mesh descriptor SUICIDE, ATTEMPTED this term only
7	Mesh descriptor SUICIDAL IDEATION this term only
8	MeSH descriptor MOOD DISORDERS explode all trees
9	Mesh descriptor NEUROTIC DISORDERS this term only
10	MeSH descriptor DEPRESSION this term only
11	MeSH descriptor ADJUSTMENT DISORDERS this term only
12	MeSH descriptor ANXIETY this term only
13	MeSH descriptor ANXIETY, CASTRATION explode all trees
14	MeSH descriptor ANXIETY DISORDERS explode all trees
15	MeSH descriptor ANXIETY, SEPARATION this term only
16	MeSH descriptor PANIC this term only
17	MeSH descriptor SOMATOFORM DISORDERS explode all trees
18	MeSH descriptor HYSTERIA this term only
19	MeSH descriptor FACTITIOUS DISORDERS explode all trees
20	MeSH descriptor FATIGUE SYNDROME, CHRONIC this term only
21	MeSH descriptor OBSESSIVE BEHAVIOR explode all trees
22	MeSH descriptor COMPULSIVE BEHAVIOR explode all trees
23	MeSH descriptor GAMBLING this term only
24	MeSH descriptor TRICHOTILLOMANIA this term only
25	MeSH descriptor SEXUAL DYSFUNCTIONS, PSYCHOLOGICAL this term only
26	MeSH descriptor DYSPAREUNIA this term only
27	MeSH descriptor VAGINISMUS this term only
28	MeSH descriptor STRESS, PSYCHOLOGICAL explode all trees
29	MeSH descriptor AFFECTIVE SYMPTOMS this term only
30	anorexia and nervosa
31	bulimi*
32	eating and disorder*
33	suicid* or parasuicid*
34	self and mutilat*
35	self and injur*
36	affective and disorder*
37	mood and disorder*
38	bipolar
39	mania or manic or hypomani*
40	((rapid NEXT cycling) and disorder*)
41	schizoaffective
42	neurotic or neurosis or neuroses or psychoneuro*
43	depress*
44	dysthymi*
45	anxiety or anxious
43	panic
47	(phobia* or phobic* or agoraphobi* or clasutrophobi* or acrophobi* or ophidiophobi*)

48	stress and disorder*
49	(PTSD or posttrauma* or post-trauma* or (post NEXT trauma*))
50	psychological and stress*
51	combat
52	somatoform or somatic or somatization
53	hypochondri*
54	hysteri*
55	conversion and disorder*
56	neurastheni*
57	munchausen
58	(chronic and fatigue and syndrome) or CFS
59	OCD or obsess* or compulsi*
60	(gambl* or betting or wagering or ludomania* or ludopath*)
61	trichotillomani*
62	Mesh descriptor: [substance-related disorders] 1 tree(s) exploded
63	Mesh descriptor: [Attention Deficit Disorder with hyperactivity]
64	Mesh descriptor: [Autism spectrum disorder]
65	Mesh descriptor: [Conduct disorder]
66	Mesh descriptor: [Learning disabilities]
67	Mesh descriptor: [Intellectual disability]
68	Mesh descriptor: [schizophrenia spectrum and other psychotic disorder]
69	Mesh descriptor: [Dementia]
70	(eating disorder* or anorexia nervosa or bulimi* or binge eat*):ti,ab
71	((self adj (injur* or mutilat*)) or suicide* or suicidal or parasuicid*):ti,ab
72	(mood disorder* or affective disorder* or bipolar i or bipolar ii or (bipolar and (affective or disorder*)) or mania or manic or cyclothymic* or depression or depressive or dysthymi* or neurotic or neurosis or adjustment disorder* or antidepress*):ti,ab
73	(anxiety disorder* or agoraphobia or obsess* or compulsi* or panic or phobi* or ptsd or posttrauma* or post trauma* or combat or somatoform or somati#ation):ti,ab
74	(body dysmorphi* or conversion disorder or hypochondria* or neurastheni* or hysteria or munchausen or chronic fatigue* or gambling or trichotillomania or vaginismus or anhedoni*):ti,ab
75	(affective symptoms or mental disorder* or mental health):ti,ab
76	(Schizophreni* or psycho* or sever* mental* ill*):ti,ab
77	(alcohol depend* or alcohol* or addict*):ti,ab
78	(drug dependen* or drug abuse* or drug addict*):ti,ab.
79	(Attention deficit hyperactivity disorder* or Attention deficit disorder* or ADHD or conduct disorder):ti,ab.
80	(Autis* or autism spectrum disorder or Asperg*):ti,ab
81	(Learning disab* or learning disorder* or intellectual disab*):ti,ab
82	(Dementia or alzheimer*):ti,ab
83	Or 1-82
84	(coronavirus OR corona virus OR coronavirinae OR coronaviridae OR betacoronavirus OR covid19 OR covid 19 OR nCoV OR CoV 2 OR CoV2 OR sarscov2 OR 2019nCoV OR novel CoV OR wuhan virus):ti,ab.
85	((wuhan OR hubei OR huanan) AND (severe acute respiratory OR pneumonia) AND (outbreak)):ti,ab.

86	Mesh descriptor: [Coronavirus]
87	Mesh descriptor: [Coronavirus Infections]
88	MeSh descriptor: [COVID-19]
89	MeSH descriptor: [SARS-CoV-2]
90	Mesh descriptor: [Betacoronavirus]
91	OR/84-90
92	Mesh descriptor: [Systematic review]
93	systematic review
94	Mesh descriptor: [Meta-analysis]
95	or meta-analysis.ti,ab,pt.
96	OR/92-95
98	AND/83,91,96

Table A6: Characteristics of included systematic reviews.

Study ID	Search dates	Databases searched	Inclusion/exclusion	Number of studies included	Country where studies took place (N)	Study design included (N studies)	N participants included (% Female)	Population (N studies)
Cenat et al., 2020	Database inception until 12-05-2020	PsychInfo (Ovid), MEDLINE (Ovid), Embase (Ovid), CINAHL (Ebsco), Scopus, Web of Science	Published peer-reviewed journal articles were included if they met the following criteria: (1) were published in either French or English, (2) had empirical data on the prevalence of mental health symptoms or disorders collected during the COVID-19 pandemic. There were no restrictions in terms of age or the type of population studied (e.g., HCW, patients, non-patients).	55	China (44), Italy (4), India and Singapore (1), France (1), United States (1), Iran (5), Vietnam (1), Spain (1), Turkey (1), Israel (1), Singapore (1), Bolivia (1), Ecuador (1), Malaysia (1), Multiple countries (2), Pakistan (1), Peru (1)	NR	189,159	General population (41), Healthcare Workers (27)

Castaldelli-Maia et al., 2020	Database inception until 29-07-2020	MEDLINE, Web od Science, BIOSIS Citation Index, Current Connect, PsychInfo, CINAHL	We included studies that reported categorical assessment of anxiety and depression using GAD-7 and PHQ-9 scales during the COVID-19 pandemic. Randomized controlled trials, cohort studies, case-control studies, and cross-sectional studies were included. Pre-prints and letters were included if they described original research.		India (2), Korea (1), Iran (1), Saudi Arabia (2), Italy (2), Russia (1), Germany (2), China (23), United States (4), United Kingdom (2), Bangladesh (1), Norway (1), Albania (1), Spain (1), Jordan (1), Vietnam (1), Nigeria (1), Austria (1), United Arab Emerites (2), Pakistan (2), Brazil (1), Nepal (1), Cyprus (1), Japan (2), Serbia (1), Switzerland (1).		226,638 (61.9%)	General population (27), Healthcare providers (16), mixed (7), students (11), patients (6)
Cavicchioli et al., 2021	January 2000 - July 2020	Pubmed, Scopus, Embase, PsycINFO, Cochrane Library, Web of Science	Inclusion: (a) studies had to report data on mental health indexes linked to epidemic infections, which required containment interventions based on quarantine; (b) only those studies were included in which valid and reliable instruments were administered, which reported the cut-off value of clinical relevance, to assess mental health impacts of quarantine; (c) studies had to be written in English. Exclusion: Case reports,	21	Canada, Australia, China, United States, Korea,			

			letters to the editor, meeting abstracts, book chapters, studies carried out on health care workers, qualitative studies					
Hessami et al., 2020	Inception - 05-07-2020	MEDLINE, Embase, Global Health, the Cochrane Library, Health Technology Assessment Database, Web of Science	Inclusion: a study with an observational design in the English language evaluated the depression and anxiety among the studied population using Edinburgh Postnatal Depression Scale (EPDS) and State-Trait Anxiety Inventory (STAI) scores respectively. Exclusion: Other records such as case report, animal study, letter to editor, review study, abstracts without full text were excluded.	8	Italy (2), Chnia (1), Canada (3), Turkey (1), Greece (1)	Case-control (1), cross-sectional (5), prosopective observational (1), not reported (1)	7750 (100%)	Pregnant or postpartum women

Li et al., 2021	01-12-2019 - 01-08-2020	Embase, MEDLINE, PsychINFO, Global Health, Web of Science, Google Scholar, CINAHL, SinoMed, WanfangMed, CNKI, CQVIP	Inclusion: (1) published in English or Chinese since the outbreak of COVID-19 in December 2019; (2) report on depression, anxiety or PTSD among health care workers (both clinical and support) in a country affected by COVID-19; (3) used an established assessment of depression, anxiety or PTSD, through either a self-report screening tool or diagnostic interview; (4) provided sufficient information to calculate prevalence of depression, anxiety or PTSD among health care workers (e.g. percentage or sample size and number). Exclusion: qualitative studies, study protocols and review articles. We did not limit our inclusion to peer-reviewed articles only, and included research letters, briefs and academic preprints stored on servers such as bioRxiv and medRxiv.	65	Italy (3), Thailand (1), Oman (1), Chnia (43), India (2), Singapore and India (1), United Kingdom (1), China and Hong Kong (2), Turkey (1), United States (2), Argentina, Brazil, Chile and Mexico (1), Togo (1), Jordan (1), Iran (3), Pakistan (1), Taiwan (1), Saudi Arabia (1), Switzerland (1).	All cross-sectional, Five studies adopted random sampling techniques, whilst the other 60 used non-random methods (for example, self-selection through an online survey, or purposeful sampling). Studies with minimal information on sampling technique were deemed non-random.	97,333 (70%)	Healthcare workers (nurses 45%, doctors 27%, other medical workers 11%, administration and support staff 1%), unidentified occupation 17%)

Luo et al., 2020	01-11-2019 - 25-05-2020	Embase, PubMed, Google Scholar, WHO COVID-19 database	Inclusion: Original research of quantitative studies examining the psychological distress of COVID-19 among medical staff, the general public, and patients with pre-existing conditions or infected by COVID-19. Exclusion: 1) were irrelevant to the exposure (COVID-19) or the outcome (psychological impact, mental impact); 2) were animal studies, experimental studies or genetic studies; 3) did not use a validated instrument to measure the psychological impact; 4) were not in English language.	62	China (40), Singapore (2), India (2), Japan (1), Pakistan (1), Vietnam (1), Iran (4), Israel (1), Italy (4), Spain (2), Turkey (2), Denmark (1), Greece (1), Argentina, Brazil, Chile and Mexico (1)		162,639	Healthcare workers (19), general population (36), Patients (7, cancer (1), psychiatric (1), epilepsy (1), COVID-19 (2), type 2 diabetes (1)parkinsons disease and care givers (1)

Sanghera et al., 2020	31-12-2019 - 17-06-2020	MEDLINE, Embase, Medrix	**Inclusion:** 1. Studies which examined the impact of SARS-CoV-2 on healthcare professionals. 2. Studies which investigated at least one International Classification of Diseases-10th Revision (ICD-10) defined psychiatric condition. 3. Use of at least one validated quantitative scoring scale to measure mental health outcomes, or a self-designed one based on a pre-existing, validated scale 4. Available in English Language 5. Hospital based 6. Conducted from 31st December 2019 (when China reported the first case of SARS-CoV-2 in Wuhan) to 17th June 2020 **Exclusion:** 1. Studies investigating non-hospital–based HCWs exclusively 2. Written in non-English language 3. Studies with fewer than 20 participants	44	China (27), Thailand (1), Oman (1), Italy (2), India and Singapore (1), United Kingdom (1), Romania (1), Turkey (1), Spain (1), Iran (2), Jordan (1), Pakistan (1), United States (1), Singapore (1), Hong Kong (1), India (1)	Cross-sectional (44)	69499 (NR)	Healthcare workers (nurses (38), doctors (42))

Thomb et al., 2020	31-12-2019 onwards	MEDLINE (Ovid), PsychINFO (Ovid), CINAHL, EBMASE (Ovid), Web of Science, China National Knowledge Infrastructure, Wanfang database	Inclusion: studies of any population affected by COVID-19 outbreak since December 2019 when China first reported to the WHO. Studies in any language. Studies must report proportions of participants meeting diagnostic criteria using diagnostic interview of symptoms (based on a threshold or continuously measured) prior to and after a delineated event related to COVID-19 (e.g. the announcement of the outbreak generally or the location where the research took place, prior to isolation protocols and after initiation, or during isolation and following relaxation of restrictions). Mental health symptoms are defined broadly and will include, for example, symptoms or indicators of anxiety, depression, stress, loneliness, anger, grief, or other emotional disturbance. Exclusion: studies with <100 participants.	54	Brazil (1), Canada (1), Czech Republic (1), Denmark (2), New Zealand (1), Germany (1), Argentina (2), India (2), Italy (1), Spain (2), The Netherlands (2), China (18), Japan (2), United States (5), United Kingdom (8), Switzerland (1), Australia (1), United States, United Kingdom, Canada, Ireland (1), Canada, France, United Kngdom, United States (1),Canada, United States, United Kngdom, Belgium, Italy (1)	Longitudinal (22), pre and post measurement (32)	136,724 (NR)	General population (23), University studnets (9), those with pre-existing chronic medical conditions (7), medical staff (4), children and adolescents (3), young adults (2), sexual and gender minority people (1), pre-existing mental health conditions (1).

Wang et al., 2020	12-2019 - 15-07-2020	Pubmed, EMBASE, Scopus, Cochrane Library, PsycINFO, WHO COVID database	Inclusion: 1) authors reported risk estimates (odds ratio [OR] and 95% confidence interval [CI]) of factors associated with higher odds of self-reported psychological distress (e.g. anxiety, depression, distress, stress, post-traumatic stress, and insomnia) using standardized and validated psychometric tools; 2) studies reported at least one of the pre-defined factors: gender, age, rural residence, and SES strata (education, income, and employment status); and 3) articles were original, peer-reviewed cross-sectional studies and published in English or Chinese languages. Exclusion: 1) were not relevant (not using pre-defined factors as the exposure or psychological distress of COVID-19 as the outcome); 2) did not report the OR of factors (e.g. studies using linear regression analyses) or associated 95% CI; 3) were animal or experimental studies, reviews, or meta-	68	China (39, Japan (1), Vietnam (1), Italy (6), United Kingdom (2), Spain (2), Turkey (2), Slovenia (1), Albania (1), France (1), Ireland (1), United States (3), Colombia (1), Iran (1), Israel (1), Saudi Arabia (1), Jordan (1), India (2), Tunisia (1)	NR	28,830 (NR)	General population, Pregnant women (3), high school students and college students (2), patients (10), health care workers (2), children and adolescents (5)

			analyses; 4) were conducted exclusively among healthcare professionals. Eligibility was assessed by first screening titles and abstracts, followed by full-text reviews.					

Yan et al., 2020	01-01-2019 - 19-09-2020	PubMed, EMBASE, and Web of Science databases	Inclusion: Studies were included if they reported the prevalence rates of depression, anxiety, insomnia, post-traumatic stress disorder (PTSD), and/or other mental health disorders among pregnant and/or postpartum women during the COVID-19 pandemic. Studies were also included if they reported data from which prevalence rates could be calculated. Exclusion: Letters, case reports, or reviews were excluded.	23	China (7), United States (3), Turkey (3), Italy (3), Canada (2), Japan (1), Belgium (1), Colombia (1), Sri Lanka (1), Israel (1).	Cross-sectional (19), Case-control (4)	20,596 (100)	Pregnant or postpartum women

Robinson et al., 2021	12-2020 - 11-01-2021	Pubmed, SCOPUS, Web of Science, PsycINFO	Inclusion: Studies sampled the same cohort of participants prior to 11/03/20 (date the WHO declared a pandemic) and at least once after this date. Chinese studies were eligible (but analysed separately) if mental health was assessed prior to and after 23/01/20 because substantial social restriction measures were enforced across China from this point. There were no limits on populations sampled. Studies were required to have collected data using a validated multi-item measure of mental health symptoms or mental well-being, such as depression (e.g. Patient Health Questionnaire: PHQ9), anxiety (Depression, Anxiety, Stress Scale: DASS), non-specific general mental health related functioning and distress (General Health Questionnaire: GHQ12, Kessler) and well-being (Warwick-Edinburgh Mental Wellbeing Scale). Studies that examined continuous changes (i.e. standardised mean change; SMC) in mental	65	Germany (4), United Kngdom (9), United States (16), Italy (6), China (4), United States, Canada, Belgium, Denmark, Italy, United Kingdom (1), Turkey (2), Switzerland (2), Spain (1), Denmark (1), Norway (1), Slovakia (1), Netherlands (4), Sweden (1), United States, United Kingdom, Canada Ireland (1), Japan (2), Australia (2), India (2), Finland (1), Czech Republic (1), New Zealand (1), Brazil (1), US, Canada, United Kingdom, France (1), Netherlands (4), Sweden (1)		~55,015	General population (75), University students (40), Pre-existing MH conditions (25), pre-existing physical health (14)

			health symptoms were eligible, as was change in the % of the sample meeting questionnaire specific cut-offs for clinically relevant/likely serious mental health problems were eligible (i.e. Odds Ratio). Studies were required to sample the same participants using the same measure of mental health pre and post-pandemic (repeated cross-sectional studies were not eligible). If only a sub-sample of participants were followed up across survey waves, only data from the sub-sample were eligible. If multiple articles reported on data from the same cohort of participants, the article with the largest number of post-pandemic follow-up data collection points was included. Journal articles and pre-prints were eligible Exclusion: Interventions to improve mental health during the pandemic were not eligible. As our focus was on mental health symptoms, ineligible measures included loneliness,					

			stress and physical health related quality of life.					

Chen et al., 2021	10-11-2019 - 16-11-2020	Pubmed, EMBASE, Web of Science	Inclusion: a. Context: COVID-19 epidemic in China b. Population: frontline HCWs, general HCWs, and general adult population c. Outcome: at least one mental disorder outcomes, e.g., anxiety, depression, distress, general psychological symptoms (GPS), insomnia, and PTSD d. Instrument: validated scales with cutoff points for the mental health outcomes e. Language: English. Exclusion: a. Population: children, adolescents, or specific niche adult populations such as COVID-19 patients, inpatients or other patients, adults under quarantine, pregnant/postpartum women b. Methodological approaches: non-primary studies such as reviews or meta-analyses, qualitative or case studies without a validated instrument, interventional studies, interviews, or news reports	131	China (131)	Cross-sectional (126), Cohort (5)	630,244	Frontline Healthcare workers (47), General Healthcare workers (46), General population (78)

			c. Measurements: non-validated mental health instruments (i.e., self-made questionnaire) or instruments without a validated cutoff score to calculate a prevalence rate (i.e., STAI, SCL-90 for anxiety and depression).					

Table A7: Summary of results of included systematic reviews

Study ID	Anxiety scales (N)	Results reported	Depression scale	Results reported	PTSD	Results reported	Other scales	Results reported
Cenat et al., 2020	Beck Anxiety Assessment (1), General Anxiety Disorder 7 item (24), General Anxiety Disorder 2 item (3), Self-rating Anxiety Scale (5), Depression Anxiety and Stress Scale 21 item (7), Hamilton Anxiety Scale, Hospital Anxiety and Depression (1), Screen for Child Anxiety Related Emptional Disorders (1), Patient Health Questionnaire 4 item (2),	The pooled prevalence of anxiety among participants is 15.15% CI 95% [12.29%;18.54%]. There is heterogeneity in the results (I2 = 99.58). No differences in the prevalence of anxiety between citizens (k=31, 14.62, 95% CI [10.69;19.69]) and HCW (k=23, 15.86, 95% CI [12.22;20.33]), (z = 0.40, p > 0.05). No difference in the prevalence of anxiety in studies conducted in China (k=33, 13.49, 95% CI [9.90;18.11]) compared to studies conducted in other countries	Beck depression inventory (2), Self-rating Depression Scale (4), Depression Anxiety Stress Scale 21 item (7), Beck Depression Inventory-II (1), WHO-Five Well being Index (1), Patient Health Questionnaire 9 item (14), Hamilton Depression Scale (2), Hospital Anxiety and Depression Scale (1), Patient Health Querstionnaire 4 item (1), Patient Health Questionnaire 2 item (2).	The pooled prevalence is 15.97% CI 95% [13.24%;19.13%]. Heterogeneity in the results (I2 = 99.44) (Higgins et al., 2003). No differences in the prevalence of depression between citizens (k=28, 17.05, 95% CI [13.03;22.01]) and HCW (k=18,13.75, 95% CI [11.04;16.96]), (z = -1.24, p > 0.05). No difference in the prevalence of depression in studies conducted in China (k=34, 16.23, 95% CI [13.02;20.04]) compared to studies conducted in other countries	PTSD Checklist-Civilian version (2), PTSD Checklist for DSM-5 post traumatic symptoms subscale (2), Impact of Events Scale-Revised (8), Global Psychotrauma Screen (1).	The pooled prevalence of PTSD among participants is 21.94% CI 95% [9.37%;43.31%]. There is heterogeneity in the results (I2 = 99.85) (Higgins et al., 2003). No difference in the prevalence of PTSD between citizens (k=9, 22.43, 95% CI [7.62;50.32]) and HCW (k=4, 20.91, 95% CI [5.01;57.00]), (z = -.09, p > 0.05).		

		(k=18, 19.02, 95% CI [15.01;23.80]), (z = 1.78, p > 0.05). However, we might lack statistical power to detect a difference between the two groups. No differences in the prevalence of anxiety between males (k=6, 14.19, 95% CI [7.14;26.23]) and females (k=6, 17.87, 95% CI [9.64;30.73]), (z = -0.51, p > 0.05).		(k=12, 16.92, 95% CI [11.78;23.70]), (z = .20, p > 0.05). No differences in the prevalence of depression between males (k=9,19.05, 95% CI [11.17;30.57]) and females (k=9, 22.93, 95% CI [15.16;33.14]), (z = -0.57, p > 0.05).				
Castaldelli-Maia et al., 2020	Generalized Anxiety Disorder 7 item (cut-off 10+)	Global prevalence of anxiety of 21.3% (95%CI:19.0-23.6%). Asia had lower levels of anxiety (17.9%, 95%CI:15.4-20.3) compared to other regions of the world (28.6%, 95%CI:22.6-34.6). Europe did not differ from Asia and the other regions of the world.	Patient Health Questionnaire 9 item (cut off 10+)	Global prevalence of 24.0% (95% Confidence Interval (CI): 21.0-27.1%) of depression; Depression was observed among 17.6% (95%CI:15.4-19.8%) in Asia, among 26.0% (95%CI: 22.9-29.05) in Europe, and among 39.1% (95%CI: 29.2-49.1%) in other regions of the				

		China had a lower prevalence of anxiety (15.5%, 95%CI:13.1-17.9%) compared to all other countries (25.6%, 95%CI:23.1-28.0). The number of studies in each of the other countries was too restrictive to make country-specific comparisons (i.e., U.S. was the second country with more studies having just 4 studies). No significant differences by population type, country income level, or being a local study. Meta-regression: Both in the 2- and 4-week physical distancing models, the closure of public transportation was associated with anxiety. Student studies had lower levels		world. China had a lower prevalence of depression (16.2%, 95%CI:13.7-18.2%). than in other countries (29.0%, 95%CI:24.8-33.2). No significant differences by population type, country income level, or being a local study. Meta-regression: Both in the 2- and 4-week physical distancing models, previous depression, older studies, and other region of the world than Asia/Europe were associated with depression. In addition, patient studies had a higher prevalence of depression in the 2-week physical distancing model. No significant association with physical				

		of anxiety in both models. No other significant association between physical distancing measures and depression or anxiety were found.		distancing implementation measures was found in both models.				
Cavicchioli et al., 2021								

Hessami et al., 2020	Stae-Trait Anxiety Inventory	Anxiety score was significantly higher during the pandemic when compared with pre-pandemic time (SMD = 0.82, 95% CI: 0.49-1.16, p<.001; I2 = 90.2%).	Edinburgh Postnatal Depression Survey	Overall mean of EPDS scores was 9.84 (95% CI 8.36-11.33; p<.001; I2 = 98.7%). As compared to the pre-pandemic period, the pooled findings showed that the EPDS score (SMD = 0.40, 95% CI: -0.05-0.86, p=0.083; I2 = 98.0%) was higher among study subjects during COVID-19 pandemic; however, this difference was not statistically significant (p=0.083).				

Li et al., 2021	Generalized Anxiety Disorder 7 item (29), Self-Rating Anxiety Scale (9), Depression Anxiety Stress Scale 21 item (6), Hospital Anxiety and Depression Scale (3), Generalized Anxiety Disorder 2 item (3), Patient Health Questionnaire 4 item (2), Hamilton Anxiety Rating Scale (2)	The pooled prevalence of moderate anxiety was 22.1% (95% CI, 18.2%-26.3%) across 57 studies, when defining anxiety as a score at or above the cut-off for moderate symptomology, or the cut-off noted by the author to be clinically relevant. Individual study estimates ranged from 5.2% to 89.7%, and there was significant evidence of between-study heterogeneity (I2 = 99.4%, p<0.001). The prevalence of mild anxiety was estimated at 38.3% (95% CI, 32.6%-44.3%) when defining the presence of anxiety symptoms as the cut-off for mild anxiety, or the cut-off for a clinically relevant score	Patient Health Questionnaire 9 item (28), Self-rating Depression Scale (7), Depression Anxiety Stress Scale 21 item (6), Patient Health Questionnaire 2 item (3), Hospital Anxiety and Depression Scale (HADS), Patient Health Questionnaire 4 item (2), Center for Epidemiologic Studies Depression Scale (2)	Estimated pooled prevalence of moderate depression 21.7% (95% CI, 18.3%-25.2%) across 55 studies, when defining depression as a score at or above the cut-off for moderate symptomology, or the cut-off deemed by the author to be clinically relevant. Individual study estimates ranged from 5.3% to 57.6%. Evidence of high between-study heterogeneity (I2 = 99.3%, p<0.001). The pooled estimate of mild depression was 36.1% (95% CI, 31.3%-41.0%) when defining the presence of depressive symptoms as a score at or above the cut-off for mild symptomology, or	Impact of Events Scale -Revised (5), Post-Traumatic Stress Dsorder Self-Rating Scale (1), Global Psychotrauma Scale-PTSD (1), PTSD Checklist (1), PTSD Checklist - Civilian version (1)	Pooled prevalence estimate of moderate PTSD was 21.5% (95% CI, 10.5%-34.9%) when defined as a score at or above the cut-off for moderate symptomology, or the cut-off noted by the author to be clinically relevant. Individual study estimates ranged from 2.9% to 49.5%, and there was evidence of between-study heterogeneity (I2 = 99.7%, p<0.001).		

				that noted by the author to be clinically relevant.				
		Prevalence estimates of moderate anxiety differed significantly across region ($p<0.001$). The studies from the Middle-East yielded the highest pooled prevalence estimate (28.9%; 95% CI, 21.6%-36.8%), and the lowest was calculated across the studies of North America (14.8%; 95% CI, 13.9%-15.7%). The 37 studies from China yielded a pooled prevalence (19.1%; 95% CI, 15.5%-23.0%) slightly lower than calculated across all studies from East Asia (20.5%; 95% CI, 15.7%-25.8), although the confidence intervals overlap, suggesting similar distribution of estimates.		Prevalence estimates of moderate depression were compared between region: East Asia, South Asia, the Middle-East, Europe, North America, West Africa and South America (Table 1). The estimates of these regions significantly differed ($p = 0.001$). Pooled estimates were highest for studies conducted in the Middle-East (34.6%; 95% CI, 25.1%-44.9%), although relatively wide confidence intervals were present. Pooled estimates were lowest in North America (18.7%; 95% CI, 17.8%-19.7%) and East Asia (19.1%; 95%				

		29 studies used the GAD-7, and the pooled prevalence estimate across these studies was 20.8% (95% CI, 17.2%-24.7%). The highest pooled prevalence was calculated from the studies using HADS (32.0%; 95% CI, 10.8%-58.1%), although this group included only three studies and the confidence intervals are wide. Those studies using the SAS yielded the lowest pooled estimate (10.1%; 95% CI, 5.6%-15.6%), although it should be noted that the confidence intervals overlap with those of the HADS. The pooled estimates of these subgroups differed significantly (p<0.001).		CI, 15.2%-23.4%). Pooling the estimates of the 37 studies from China only did not result in a substantially different estimate to that of all studies from East Asia. 28 of the included studies used the PHQ-9 to screen for depressive symptoms, and when estimates were pooled, these studies yielded a prevalence of 21.9% (95% CI, 16.2%-28.2%). The highest pooled prevalence estimate was calculated across the three studies using the HADS (29.2%; 95% CI, 16.3%-60.2%), with the lowest estimate from the six studies using the DASS-21 (18.7%; 95% CI 9.6%-30.0%), although it is				

		Data on the proportion of participants in contact with patients infected with COVID-19 was provided in 27 studies only. Studies in which more than 50% of participants were in contact with patients with COVID-19 demonstrated a higher prevalence of anxiety (25.7%; 95% CI, 17.4%-34.9%), compared to studies in which 50% or fewer participants were in contact (17.4%; 14.5%-20.4%), although evidence of this difference was of borderline significance (p = 0.06). Prevalence estimates did not significantly differ based on sample size (p = 0.73); publication status		worth noting the wide and overlapping confidence intervals, suggesting imprecise estimates. The subgroup analysis suggested evidence of differential prevalence estimates between screening tools (p<0.001). There was no evidence of differential prevalence estimates across other subgroups: sample size (p = 0.81); publication status (p = 0.30); the proportion of female participants (p = 0.91); and the proportion of participants in contact with infected patients (p = 0.92). Moreover, none of the covariates				

		(p = 0.13); and the proportion of female participants (p = 0.25). Based on the univariate meta-regression analyses, there was evidence that the following variables explained between study heterogeneity: sampling method (p = 0.03); screening tool (p = 0.05); publication status (p = 0.03); and the proportion of participants in contact with infected patients (p = 0.04). The subsequent multi-variate meta-regression model suggested that these variables explained approximately 17% of the between-study variance (adjusted R2 = 17.4%).		included in the meta-regression model explained the presence of heterogeneity.				

Luo et al., 2020	Beck Anxiety Inventory, the Depression, Anxiety and Stress Scale-21, the Generalized Anxiety Disorder-2/-7, the Hamilton Anxiety Rating Scale, the Hospital Anxiety and Depression Scale, the Patient Health Questionnaire-4/-9, and the Zung Self-Rating Anxiety Scale	The overall prevalence of anxiety was 33% (28%-38%) with substantial heterogeneity (I2=99.7%, P<0.001). The prevalence of anxiety was higher among patients (56% [39%-73%]) compared to healthcare workers (26% [18%-34%]) and the general public (32% [25%-39%]), and the prevalence was similar between healthcare workers and the general public with overlapping 95% confidence intervals. Among healthcare workers, the prevalence ranged between 7% (5%-9%) in Singapore to 57% (52%-63%) in Italy.	Different validated scales used to measure depression included the Beck Depression Inventory, the Center for Epidemiologic Studies Depression Scale, the Children's Depression Inventory— Short Version, the Depression, Anxiety and Stress Scale-21, the Edinburgh Postnatal Depression Scale, the Hamilton Depression Rating Scale, the Hospital Anxiety and Depression Scale, the Patient Health Questionnaire-4/-9, and the Zung Self-Rating Depression Scale.	The overall prevalence of depression was 28% (23%-32%) with substantial heterogeneity (I2=99.6%, P<0.001). The prevalence of depression was higher among patients (55% [48%-62%]) compared to healthcare workers (25% [17%-33%]) and the general public (27% [22%-33%]), and the prevalence was similar between healthcare workers and the general public with overlapping 95% confidence intervals. Among healthcare workers, the prevalence ranged between 9% (7%-12%) in Singapore to 51% (48%-53%) in China.		The prevalence of post-traumatic stress symptoms/disorders was the highest among patients with COVID-19 (93% [92%-95%]), which was higher than that reported in healthcare workers and the general public (prevalence ranged between 3% [2%-4%] to 16% [15%-17%]).		

		Among the general public, the highest prevalence of anxiety was observed in Italy (81% [80%-83%]), and the prevalence ranged between 8% (7%-10%) and 55% (45%-64%). Among patients with pre-existing conditions and COVID-19, the prevalence of anxiety was consistently high; it ranged between 40% (30%-50%) among patients with type 2 diabetes in India and 82% (74%-88%) among patients with Parkinson's disease in Iran. The anxiety prevalence was 47% (34%-61%) among patients infected by COVID-19, and it		Among the general public, the highest prevalence of depression was observed in Italy (67% [65%-69%]), and the prevalence ranged between 10% (9%-11%) and 60% (50%-70%). Among patients with cancer and COVID-19, the prevalence of depression ranged between 50% (41%-59%) among cancer patients and 65% (51%-77%) among patients with COVID-19 in China. Psychiatric patients reported a prevalence of moderate-to-severe depression of 22% (13%-32%).				

		was 50% (41%-59%) among cancer patients and 58% (47%-68%) among caregivers of patients with Parkinson's disease. In addition, psychiatric patients reported a prevalence of moderate-to-severe anxiety of 24% (14%-33%).						

Sanghera et al., 2020	Generalized Anxiety Disorders 7 item (11)	Using the cut-off score ≥10, seven studies showed anxiety prevalence ranging from 12.3% to 35.6%.	Patient Health Questionnaire 9 item (10)	PHQ-9: Using the cut-off score ≥10, eight studies showed depression prevalence ranging from 13.5% to 44.7%.	Impact of events scale -revised (7)	Using the cut-off score >24/25 four studies showed PTSD prevalence ranging from 7.4% to 37.4%		

Thomb et al., 2020	**Pre/post pandemic onset:** Generalized Anxiety Diorder-7 (4), Gneralized Anxiety Disorder-2 (1). **Changes during the pandemic:** Generalized Anxiety Disorder-7 (1), State Trait Anxiety Inventory, Psychological Questionnaire on Emergency Events in Public Health (1)	**Pre/post pandemic onset** One study reported that compared to participant responses completed at age 26, the COVID-19 data demonstrated a small increase in continuous anxiety scores (N= 1811, 0.26 standard deviations, 95% CI 0.21 to 0.30). A longitudinal cohort study of sexual and gender minority people, reported a large increase in anxiety (0.54 standard deviations, 95% CI 0.48 to 0.60) following the COVID-19 outbreak. One study reported that there was a small increase in anxiety scores after lockdown (N=3563, 0.16 standard	**Pre/post pandmic onset**: Short Mood and Feelings Questionnaire (1), Patient Health Questionnaire (1), General Health Questionnaire (1). Changes during pandemic: Patient Health Questionnaire (1),Beck Depression Inventory (1), Composite International Diagnostic Interview (1), Psychological Questionnaire on an Emergent Event in Pub,ic Health (1)	**Pre/post onset of COVID-19 outbreak** One study reported that compared to participant responses completed at age 26, the COVID-19 data demonstrated negligible changes in continuous depression scores (N= 2219, -0.11 standard deviations, 95% CI -0.06 to -0.15) A longitudinal cohort study of sexual and gender minority people, reported a small increase in depression (N=2288, 0.19 standard deviations, 95% CI 0.14 to 0.25) following the COVID-19 outbreak One study reported that there was a small increase in depression			**Pre/post pandemic:** General Health Questionnaire-12 (1), Symptom Checklist-90-Revised (2), Mental Health Inventory-5 (2). **Changes during pandmic:** Kessler Psychological Distress Scale, Brief Job Stress Questionnaire	**Pre/post pandemic onset** Three studies compared responses from a representative sample of British adults (UK Household Longitudinal Study, UKHLS) between wave 9 and the COVID-19 wave. All of them reported that there was a small increase in general mental health symptoms over time. One study reported that SCL-90 total scores during COVID-19 were lower than the corresponding pre-COVID scores (N= 2603, -0.20 standard deviations, 95% CI -0.25 to -0.14). One study reported that there was a significant increase (7.99%)

		deviations, 95% CI 0.12 to 0.21). One study reported a small increase in anxiety scores (N= 1811, 0.14 standard deviations, 95% CI 0.09 to 0.19). One study reported that the proportion of anxiety symptoms in the elderly population increased 5.15% over time. **Changes during the pandemic** One study compared responses of 36,520 adults in the UCL COVID - 19 Social Study, a panel study weighted to population proportions. Data were collected for 20 weeks during the course of the pandemic and latent growth models were fitted, estimating an average 0.10		among both non caregivers (N=6178, 0.25 standard deviations, 95% CI 0.22 to 0.29) and caregivers (N=1349, 0.28 standard deviations, 95% CI 0.20 to 0.35) after the COVID outbreak One study reported a small increase in depression scores (N= 1811, 0.16 standard deviations, 95% CI 0.11 to 0.21) **Changes during the pandemic** One study compared responses of 36,520 adults in the UCL COVID - 19 Social Study, a panel study weighted to population proportions. Data were collected for 20 weeks during the course of the pandemic and latent growth models were				in the proportion of participants who scored above a mental health function threshold (SCL-90 ≥ 160) during the epidemic period compared with that of freshmen when they were enrolled. One study reported that negligible changes in mental health (N=3983, -0.01 standard deviations, 95% CI -0.05 to 0.04) following the COVID-19 outbreak. Study 45398 reported that loneliness of older people increased (N= 1679, 0.52 standard deviations, 95% CI 0.45 to 0.59) while mental health remained roughly stable (0.12 standard deviations, 95% CI

		weekly point decrease in anxiety symptoms over the 20 weeks. One study reported that levels of anxiety tended to decrease (N= 6057, -0.10 standard deviations, 95% CI -0.13 to -0.06) among the general population One study reported anxiety levels remained stable (N= 1390, -0.02 standard deviations, 95% CI -0.10 to 0.05),		fitted, estimating an average of 0.11 weekly point decrease in depression symptoms over the 20 weeks One study reported that depression tended to increase slightly (N= 6057, 0.09 standard deviations, 95% CI 0.05 to 0.12) among the general population One study targeted school-age children (ages from 6 through 17 years) in China, reported that the mean CDI-S score significantly decreased between the two surveys: 4.19 before school closure and 3.90 during school closure (N= 2427, -0.11 standard deviations, 95% CI -0.16 to -0.05).				0.05 to 0.19) over time **Changes during the pandemic** An internet-based survey of Japanese people conducting in two phases: early phase and community-transmission phase, demonstrated a significant increase of psychological distress between the two phases (N= 2078, 0.15 standard deviations, 95% CI 0.09 to 0.21). One study reported that mental health symptoms increased slightly among health care workers (N=111, 0.23 standard deviations, 95% CI 0.03 to 0.50) while remained roughly stable among non health care

				One study reported that depression level increased negligibly (N= 1390, 0.08 standard deviations, 95% CI 0.00 to 0.15),				workers (N= 904, -0.02 standard deviations, 95% CI -0.12 to 0.07) during two months of the COVID-19 outbreak.

Wang et al., 2020	Depression Anxiety and Stress Scale-21 (2), Generalised Anxiety Disorder-7 (20), Hamilton Anxiety Rating Scale (1), Hospital Anxiety and Depression Scale (3), Gereneralised Anxiety Disorder-2 (3), Zung self-rating anxiety scale (4), Screen for Child Anxiety Related Disorders (3), Beck Anxiety Inventory (1), State Trait Anxiety Inventory (3), Patient Health Questionnaire-4 (1)	The overall prevalence of anxiety was 33% (95% CI: 28%-39%; I2 = 99.9%). The meta-regression analysis suggested no statistical differences across subgroups of studies using different instruments or cut-off points (see separate tab).	Depression Anxiety Stress Scale-21 (2), Patient Health Questionnaire-9 (15), Hamilton Depression Scale (1), Center for Epidemiological Studies Depression Scale (1), Hospital Anxiety and Depression Scale (2), Patient Health Questionnaire-2 (3), WHO-5 (2), Childs Depression Inventory (2), Zung self-rating Depression Scale (3), Depression Self-rating Scale for Children (1), Center for Epidemiological Studies (3), Beck Depression Inventory (1), Edinburgh Postnatal Depression Scale (1), Impact of Events Scale–Revised (1), Patient Health Questionnaire-8 (1), Patient Health	the prevalence of depression was 30% (95% CI: 26%-36%; I2 = 99.8%). The meta-regression analysis suggested no statistical differences across subgroups of studies using different instruments or cut-off points (see separate tab)				

			Questionnaire-2 (1).					

Yan et al., 2020	Beck Anxiety Inventory (1), Anxiety and Depression Checklist -K10 (1), Generalised Anxiety Disorder-7 (4), Social Anxiety Questionnaire (2), Patient Reported Outcomes Measurement Information System-Anxiety (1), Zung Self-Rating Anxiety Scale (1), State-Trait Anxiety Inventory (2), Hospital Anxiety and Depression Scale (1).	**Anxiety severity** mild 24% (95% CI = 11%–40%, I2 = 99.0%) moderate 17% (95% CI = 4%–36%, I2 = 99.6%) severe 7% (3%–13%, I2 = 97.9%) Pooled prevalence of anxiety among pregnant women was 37% (95% CI 25–49%, I2 = 99.4%). Following removing studies with high risk of bias pooled prevalence of anxiety among pregnant women of 34% (95% CI 22–47%, I2 = 99.4%). Sensitivity analysis, prevalence of anxiety among pregnant women was 39% (95% CI 25–53%, I2 = 99.1%).	Edinburgh depression scale (1), Edinburgh Postnatal Depression Survey (9), Patient Health Questionnaire,-2 (1), Patient Health Questionnaire-9 (1), Hospital Anxiety and Depression Scale, (1)	The pooled prevalence of depression among pregnant women was 31% (95% CI 20–42%, I2 = 99.4%). Removing those studies with a high risk of bias pooled prevalence of depression among pregnant women of 27% (95% CI 17–40%, I2 = 99.5%). Sensitivity analysis, removing those that affected the pooled prevalence by more than 2%: prevalence of depression among pregnant women was 29% (95% CI 23–35%, I2= 97.8%).				

Robinson et al., 2021	Revised Child Anxiety and Depression Scale (2), Depression Anxiety and Stress Scale (7), Brief Symptom Inventory (2), Hospital Anxiety and Depression Scale (2), Patient Reported Outcome Measurement Informaiton System (3), Child Behaviour Checklist (1), Generalized Anxiety Disorder-7 (13), Beck Anxiety Inventory (3), Patient Health Questionnaire-4 (1), Spence Childs Anxiety Scale (2), State-trait Anxiety Scale (1), Sympton Checklist-90 (1), Clinical Global Impression Scale (1), Children's Yale-Brown Obsessive Compulsive Scale (1)	There was a small but significant increase in symptoms of anxiety pre to post pandemic outbreak (SMC = .125 [95% CI: .019 to .230], z = 2.31, p = .021).	Revised Children's Anxiety and Depression Scale (3), Depression Anxiety and Stress Scale-21 (7), Brief Symptom Inventory Depression (2), Hospital Anxiety and Depression Scale (2), Patient Reported Outcomes Measurement Information System (1), Child Behaviour Checklist affective (1), Patient Health Questionnaire-9 (11), Beck Depression Inventory (3), Patient Health Questionnaire-8 (2), Center for Epidemiological Studies Depression (2), Strengths and Difficulties Questionnaire (1), Short Mood and Feelings Questionnaire (3), Edinburgh Postnatal Depression Scale	There was a small significant increase in symptoms of depression pre to post pandemic outbreak (SMC = .216 [95% CI: .135 to .296], z = 5.24, p < .001)			General Health Questionnaire (2) (Disstress/non-specific MH), Unidimentional Positive MH Scale (1) (Well-being), Brief Symptom Inventory (2) (Psychotic Symptoms), Eating Disorders Examination (1) (Other MH Symptoms), Patient Health Questionnaire-4 (2) (Distress/non-specific MH), Short Warwick Edinburgh MH Scale (4) (Well-being), Hopkins Symptom Checklist (1) (Discress/non-specific MH), Community Assessment of Psychic experiences (1) (Psychotic symptoms), Kessler 6 (2) (Discress/non-specific MH), Eating disorders inventory (1) (Other MH), Child Behaviour Checklist (1)	**Time analyses.** Change in symptoms from pre-pandemic levels became smaller over each month (monthly change coefficient = -.057 [95%CI: -.100 to -.013], z = 2.57, p = .010). To illustrate, among post-pandemic measures of mental health collected in March and April (n = 98) the change in mental health was statistically small and significant; SMC = .102 [95% CI: .026 to .192] z = 2.22, p = .026). Conversely, for measures collected during May-July (n = 67) there was no significant change compared to pre-pandemic mental health symptoms; SMC = .067 [95% CI: -.022 to .157], z = 1.47, p = .141). There was no robust interaction between

			(1), Quick Inventory of Depressive Symptomatology (1), Kandal and Davies Depression Scale (1), Hamilton Depression Scale (1), Patient Health Questionnaire 4 (1), Patient Health Questionnaire-2 (1), Children's Depression Inventory (1)				(distress/non-specific MH), Brief Problem Monitor-Internalizing Symptoms (1) (distress/non-specific MH), PTSD Checklist (1) (other MH), Mini symptom checklist (1) (psychotic symptoms), Social Behaviour Questionnaire Internalizing (1) (Distress/non-specific MH), Suicidal Ideation Scale (1) (Other MH), World Health Organisation quality of life mental health subscale (1) (Distress/non-specific MH), Mental Health Inventry (1) (Distress/non-specific MH), Child Trauma Symptom Scale (1) (other MH).	symptom types and time. **Overall change in MH symptoms:** From the 165 comparisons drawn from ~55,015 participants, overall change in mental health symptoms from pre-post pandemic outbreak was significant (SMC = .106 [95% CI: .039 to .172], z = 3.12, p = .002, I2 = 97.8) and indicative of heterogeneous and small increase in symptoms (SMC=0.2 is indicative of a small effect). There was no significant change in measures of general mental health (SMD = -.030 [95%CI -.158 to .098], z = 0.457, p = .648). There was a significant

								decrease in symptoms of psychosis (SMC = -.211 [95% CI: -.376 to -.046], z = 2.51, p = .012). **Sub group analyses**. Across sub-groups, we found no evidence that change in mental health symptoms differed based on age, gender, or study continent. Changes in symptoms tended to be larger among participants with a pre-existing physical health condition (SMC = .249 [95% CI: .067 to .431], z = 2.68, p = .007) compared to the general population (SMC = .118 [95% CI: .042 to .193], z = 3.04, p = .002) . Notably, change in mental health symptoms was non-significant in samples with pre-existing mental

								health conditions (SMC = -.017 [95% CI: -.211 to .178], z = 0.17, = .867). No country-level data (number of COVID cases/deaths, stringency of government measures or level) explained heterogeneity between samples (ps > .05). **Change in numbers exceeding questionnaire cut-offs for mental health problems.** Twenty-four comparisons across 12 studies (~21,825 participants) were included. There was a significant effect (single level meta-analysis), with increased odds of exceeding a questionnaire cut-off for mental health problems from pre-post pandemic

								(Marginal Odds Ratio = 1.31 [95% CI: 1.10 to 1.55], z = 3.18, p = .001, I2 = 93.2%), where an OR of 1.5 is considered a small sized effect.

Chen et al., 2021	Generalized Anxiety Disorder (77), Self-rating Anxiety Scale (30), Hospital Anxiety Depression Scale (7), Depression Anxiety Stress Scale (6), Hamilton Anxiety Rating Scale (6), Beck Anxiety Inventory (1)	**Predicted prevalence rates from meta-regression (95% CI)** Mild Anxiety: Frontline Healthcare Workers: 28% (23% - 33%). General Healthcare Workers: 22% (17% - 26%), General population: 23% (19% - 28%). Overall: 24% (20% - 28%). Moderate anxiety: Frontline Healthcare Staff: 19% (15% - 23%), General Healthcare Workers 14% (11% - 17%), General population: 15% (12% - 19%). Overall: 16% (13% - 19%). Severe anxiety: Frontline Healthcare workers: 4% (2% - 6%). General Healthcare Workers 2% (1% -	Patient Health Questionnaire (81), Self-rating Depression Scale (17), The Center for Epidemiologic Studies Depression Scale (9), Depression Anxiety Stress Scale (7), Hospital Anxiety Depression Scale (7), Hamilton Depression Scale (5), Beck Depression Inventory-II (1), WHO-5 (1)	**Predicted prevalence rates from meta-regression (95% CI)** Mild Depression: Frontline Healthcare Workers: 29% (24% - 34%), General Healthcare Workers: 23% (19% - 27%), General population: 24% (20% - 29%), Overall: 25% (21% - 29%) Moderate Depression: Frontline Healthcare Staff: 20% (17% - 24%), General Healthcare Workers 15% (12% - 18%), General population: 16% (13% - 20%). Overall: 16% 17% (14% - 20%) Severe Depression: Frontline Healthcare workers: 5% (3% - 7%). General	Impact of Event Scale-R (12), Post traumatic Stress Disorder Checklist for DSM-5 (8), Post Traumatic Scress Disorder Checklist - Civilian Version (8), Impact of Events Scale-6 (1), The Primary Care PTSD Screen for DSM-5 (1)	**Predicted prevalence rates from meta-regression (95% CI)** Mild PTSD: Frontline Healthcare Workers: 32% (25% - 40%), General Healthcare Workers: 26% (19% - 33%), General population: 27% (20% - 35%), Overall: 28% (22% - 35%) Moderate PTSD: Frontline Healthcare Staff: 23% (17% - 29%) General Healthcare Workers 17% (12% - 23%), General population: 19% (14% - 24%). Overall: 20% (15% - 25%) Severe PTSD: Frontline Healthcare workers: 6% (3% - 11%) General Healthcare 3% (1% - 7%),		

		3%). General population 2% (1% - 4%). Overall 3% (2% - 4%).		Healthcare Workers 2% (1% - 4%), General population 3% (1% - 5%). Overall 3% (2% - 5%)		General population4% (1% - 8%). Overall 5% (2% - 8%)		

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