

Longitudinal analyses of the UK COVID-19 Mental Health & Wellbeing Study (COVID-MH) during the second wave of COVID-19

Karen Wetherall, Seonaid Cleare, Heather McClelland, Ambrose J. Melson, Claire L. Niedzwiedz, Ronan E. O'Carroll, Daryl B. O'Connor, Steve Platt, Elizabeth Scowcroft, Billy Watson, Tiago Zortea, Eamonn Ferguson, Kathryn A. Robb and Rory C. O'Connor

Longitudinal analyses of the UK COVID-19 Mental Health & Wellbeing Study (COVID-MH) during the second wave of COVID-19

Abstract

Background

Waves 1 to 3 (March 2020 to May 2020) of the UK COVID-19 Mental Health & Wellbeing study suggested an improvement in some indicators of mental health across the first 6 weeks of the UK lockdown, however, suicidal ideation increased.

Aims

To report the prevalence of mental health and wellbeing of adults in the UK from March/April 2020 to February 2021.

Method

Quota sampling was employed at wave 1 (March/April 2020), and online surveys were conducted at 7 time-points. Primary analyses cover wave 4 (May/June 2020), wave 5 (July/August 2020), wave 6 (October 2020), and wave 7 (February 2021), including a period of increased restrictions in the UK. Mental health indicators were suicidal ideation, self-harm, suicide attempt, depression, anxiety, defeat, entrapment, loneliness and wellbeing.

Results

2691 (87.5% of wave 1) participated in at least one survey between waves 4 to 7. Depressive symptoms and loneliness increased from October 2020 to February 2021. Defeat and entrapment increased from July/August 2020 to October 2020 and remained elevated in February 2021. Wellbeing decreased from July/August 2020 to October 2020. Anxiety symptoms and suicidal ideation did not change. Young adults, women, those socially disadvantaged, or with a mental health condition reported worse mental health.

Conclusions

The mental health and wellbeing of the UK population deteriorated from July/August 2020 to October 2020 and February 2021, a period coinciding with the second wave of COVID-19. Suicidal thoughts did not decrease significantly suggesting a need for continued vigilance as we recover from the pandemic.

Key words: COVID-19; mental health; general population; depression, suicidal ideation.

Funding: University of Glasgow, Samaritans, Scottish Association for Mental Health and the Mindstep Foundation

Background

The COVID-19 pandemic is one of the biggest global health crises that the world has faced, and the longer-term impact of the pandemic upon the mental health and wellbeing of people globally remains unclear (1, 2). However, it is evident that its effects stretch beyond those who have been infected with the COVID-19 virus itself (SARS-CoV-2), as the public health decisions taken to mitigate its spread have led to restrictions on movement, social interactions, and the closing of non-essential services. Within the UK the first national lockdown commenced on 23rd March 2020, with two subsequent lockdowns commencing on 31st October 2020 and 6th January 2021, though this varied across the nations and regions of the UK¹.

Findings from waves 1 to 3 of the UK COVID-19 Mental Health and Wellbeing study (UK COVID-MH; 3), covering a six-week period at the start of the first UK lockdown (31st March 2020 to 11th May 2020), suggested that although mental health appeared to be adversely affected, some mental wellbeing indicators improved in the short term. For example, although still high, anxiety symptoms, defeat and entrapment decreased, while depressive symptoms and loneliness stayed the same. However, the proportion of those reporting suicidal thoughts increased over the waves, rising from 8.2% in wave 1 to 9.8% in wave 3. This finding was concerning, although there has yet to be consistent evidence of an increase in suicide rates in the UK or globally linked to the pandemic (4). The findings from waves 1 to 3 also suggested that those of a younger age, women, individuals with a pre-existing mental health condition and those from a lower socio-economic group reported worse mental health at each wave. However, we do not know whether these effects extended beyond the initial lockdown, in particular, whether the second wave of COVID-19 that started in September 2020 and lasted until April 2021 (5) and the further lockdown restrictions in the UK had an impact upon people's mental health and wellbeing. Therefore, this paper outlines the mental health and wellbeing of the participants in the UK COVID-MH study spanning wave 4 (May/June 2020) through to wave 7 (February 2021), specifically focusing on the at-risk subgroups.

Comparing pre-pandemic levels of mental health, a recent systematic review has suggested that after a significant overall increase in mental health symptoms during March-April 2020, there was a decline in these rates into May-June 2020 (6). This suggests that mental health improved over time, specifically during a time when restrictions were eased. Indeed, evidence from another review suggests that lockdowns have a negative psychological impact, although the impact is not homogenous (7). What is unclear is whether the restrictions, including a subsequent lockdown, experienced in the UK from October 2020 to March 2021 had a further impact upon mental health and wellbeing. Evidence from the COVID-19 Social Study suggests rises in anxiety and depression levels since the end of the summer 2020 (8), but overall there appears to be a dearth of research into the psychological impact of the subsequent lockdowns. Therefore, in the current study, as wave 6 (October 2020) and wave 7 (February 2021) are conducted during times of increased restrictions, whether these are associated with poorer mental health can be examined more thoroughly.

Aims

The current study reports the mental health and wellbeing of adults from across the UK during the COVID-19 pandemic, specifically data from seven timepoints spanning 12 months; wave 1 (March/April 2020), wave 2 (April 2020), wave 3 (April/May 2020), wave 4 (May/June 2020), wave 5

¹ For further information on the UK's coronavirus response, please see: <https://www.gov.uk/guidance/covid-19-coronavirus-restrictions-what-you-can-and-cannot-do?priority-taxon=774cee22-d896-44c1-a611-e3109cce8eae>

(July/August 2020), wave 6 (October 2020), and wave 7 (February 2021) of the UK COVID-MH study. As data from wave 1 (March/April 2020) to wave 3 (May 2020) of the study have been published previously (3), the focus of the analysis in this paper is upon changes from wave 4 (May/June 2020) to wave 7 (February 2021), specifically investigating changes in mental wellbeing during the second wave of COVID-19 and increased restrictions in autumn 2020 and winter 2021. Mental health and wellbeing outcomes included depressive symptoms, anxiety symptoms, suicidal ideation, defeat, entrapment, loneliness, and mental wellbeing. As well as reporting changes in outcomes over the waves, we investigated whether outcomes varied by demographic characteristics (age, sex), socio-economic grouping and the presence of a pre-existing mental health condition.

Methods

Study design, setting and participant recruitment

Participant recruitment for the UK COVID-MH study was conducted by Taylor McKenzie, a social research company. A non-probability quota sample of adults (aged 18 years or older) from across the UK was recruited in March 2020. A quota sampling methodology was employed (see (3) for more detail) to recruit a stratified sample during the early phase of lockdown, with quotas based on age, sex, socio-economic grouping (SEG) and UK region (12 regions). This study had a longitudinal design including at least 6 follow-ups. Due to COVID-19 restrictions, data were collected online in all waves.

At wave 1 (31st March to 9th April 2020) participants of an online UK panel called Panelbase.net were invited by email to participate in an online survey tracking the health and wellbeing of people in the UK. Eligibility for the study was assessed with demographic questions based on the quotas. Eligible participants then provided informed consent online, and completed a range of psychological and social measures. Participants completed two further waves within the following 6 weeks, wave 2 (10th April to 27th April 2020) and wave 3 (28th April to 11th May 2020), reported previously (3). The current paper primarily reports analysis from wave 4 (27th May – 15th June 2020), wave 5 (17th July 2020 – 17th August 2020), Wave 6 (1st October – 4th November), and wave 7 (4th February – 2nd March 2021). In the interests of completeness, data for all waves are included in Table 2 and Figures 2 and 3. Findings reported here are for depressive symptoms, anxiety symptoms, suicidal ideation, self-harm history, defeat, entrapment, loneliness, and wellbeing.

Those who took part in wave 1 were then invited by email to take part in the follow-up waves, with the exception of waves 4 and 5. Due to a technical error, only those who had completed the previous wave (wave 3) were asked to take part in wave 4 and wave 5, but all respondents were once again invited to complete wave 6 and wave 7. 15.4% (n=473) of the wave 1 sample did not take part in wave 3, and 24.3% (n=115) of that group completed wave 6 when invited. Those who did not complete wave 6 when re-invited (n=358; 75.7% of those who did not complete wave 3) were younger ($\chi^2=7.44$, $p=0.024$, $\phi=0.13$) and reported higher anxiety symptoms ($\chi^2=5.57$, $p=0.018$, $\phi=-0.11$), although there were no differences between sex, socio-economic grouping, pre-existing mental health condition, depressive symptoms or suicidal ideation. Therefore, as the effect sizes of these differences were small, we have retained these participants in the analyses. Respondents were included in the analyses if they had taken part in at least one wave of data collection from wave 4 to wave 7. The sample characteristics are presented in Table 1 (n = 2691).

[insert Table 1 around here]

Figure 1 illustrates the changes in public health restrictions in the UK occurring during each wave. The first three waves occurred within the first 6 weeks of the UK lockdown, and the subsequent four waves were roughly every 2 to 3 months, with the interval between waves increasing over time. During wave 1 to wave 3, the initial lockdown was underway. Wave 4 (May/June 2020) coincided with the easing of some restrictions across the UK (e.g., England on 13th May). During wave 5 (July/August 2020) restrictions had mostly been relaxed across the UK. Wave 6 (October 2020) coincided with the increasing of restrictions again across the UK with cases of COVID-19 on the rise. During wave 7 (February 2021) there was a UK-wide lockdown. To ensure it is clear when each wave occurred, they will be referred to by the main month and year when they occurred (e.g., wave 4 = May/June 2020), where appropriate.

The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008. All procedures involving human subjects were approved by the University of Glasgow's Medical, Veterinary & Life Sciences Ethics Committee (approval number: 200190146). The study was preregistered at AsPredicted.org (#41910). Study participants were compensated approximately £1.50 for the completion of each survey and were entered into prize draws. Details of mental health support organisations were made available to participants.

[insert Figure 1 around here]

Measures

All suicide-related items were assessed within the timeframe of the last week. Suicidal ideation was measured with 'How often have you thought about taking your life in the last week? ('one day', 'several days', 'more than half the days', 'nearly every day', 'never', 'I would rather not answer')', and 'One day' to 'nearly every day' was coded as yes, 'never' as no. Suicide attempt and self-harm were measured with 'In the last week, have you made an attempt to take your life, e.g. by taking an overdose of tablets or in some other way?' and 'In the last week, have you ever deliberately harmed yourself in any way but not with the intention of killing yourself?' ('Yes', 'No', 'I would rather not answer').

Depressive symptoms were assessed with the 9-item Patient Health Questionnaire (PHQ-9; 9), and anxiety symptoms with the 7-item Generalized Anxiety Disorder (GAD-7) scale (10). Both tools ask how often symptoms have bothered the respondents in the previous 2 weeks. A score of 10 and above on both measures is suggested to indicate moderate levels (or more) of depression and anxiety, and this cut-off is used in the current study (10, 11).

Feelings of defeat (perceived failure and loss of rank) were assessed with the four item Griffiths' short-form scale (12). Perceptions of entrapment (feeling trapped by thoughts and feelings or circumstances) were measured with the Entrapment Scale Short-form (13). Mental wellbeing was assessed using the 7-item Short Warwick Edinburgh Mental Well-Being Scale (SWEMWBS; 14). Loneliness was measured using the UCLA 3-item loneliness scale (15). Percentages are reported for all binary outcome variables (suicidal ideation, depressive symptoms, and anxiety symptoms) and mean scores are reported for all continuous outcome variables (defeat, entrapment, wellbeing, and loneliness).

Socioeconomic group (SEG) was assessed using the National Readership Survey social grade (16): high (A+B+C1) versus low (C2+D+E). Participants were asked whether they had any long-standing physical or mental impairment, illness or disability, and this was coded to create a dichotomous variable for presence or absence of a pre-existing mental health condition. Specifically, participants were asked to

select their mental or physical impairment from a list of options, which included mental health conditions, neuro-divergent disorders and alcohol and drug problems.

Statistical analysis

Analysis of waves 4-7 data was consistent with the previous waves 1-3 data, where possible to aid comparison. All analyses were conducted with Stata MP 16, using an imputed dataset of the 2691 participants who completed at least one survey from wave 4 to wave 7.

We used multiple imputation (MI) to generate 50 datasets for each outcome variable. MI is a statistical technique whereby an imputation represents one set of plausible values for missing data, and the imputation model for deriving these imputations includes predictors relevant to the missing-data mechanism. In analysis, the results from the multiple imputations are pooled into a single result (17). The binary variables (suicidal ideation, depressive symptoms, anxiety symptoms) were imputed using logistic regression (`mi impute logit`), and continuous variables (defeat, entrapment, loneliness, wellbeing) were imputed using linear regression (`mi impute regress`). The imputation model included age, gender, socio-economic group, history of mental health condition, and the region of the UK they reside.

A participant (n=2691) was included in the main analysis if they completed at least one survey from wave 4 to wave 7; therefore, there was missing data at each wave, and this varied across waves. Across these four waves, when totalled up, each variable had approximately 16.1% (n=1729/10764) missing cases (% missing at each wave: n = 307, 12.9% at wave 4; n = 547, 25.5% at wave 5; n = 4.8, 15.2% at wave 6; n = 467, 17.4% at wave 7). Suicidal ideation had 2.7% (n=299) more missing cases (18.8%, n = 2028/10764), as an option for 'would rather not answer' was included with this item (% would rather not say at each wave: wave 4 = 2.4%, wave 5 = 2.4%, wave 6 = 3.2%, wave 6 = 3.0%). Full details of missing data ('would rather not answer') and the frequencies of respondents who reported suicidal ideation, suicide attempt and self-harm are included in the supplementary materials (Table S1). For suicide attempts and self-harm, often there was more missingness than the prevalence of that outcome, but no inferential statistics are applied to these outcomes.

MI generalised estimating models (MI-GEE) were then constructed to test the changes in the variables across waves 4 to 7 for the whole sample. This approach is suitable for multilevel longitudinal panel data (18). In a sensitivity check, all analyses were conducted with and without MI, and a similar pattern was found for both, with the MI analysis more conservative and reported here. Generalised estimating (GEE) models apply a multilevel method. Binomial logit modelling was conducted for each of the binary outcome variables (suicidal ideation, depressive symptoms, and anxiety symptoms), and linear Gaussian identity modelling was conducted for the continuous outcome variables (defeat, entrapment, loneliness, and wellbeing).

To test for subgroup differences, additional GEE models were applied to the outcome variables, investigating differences in age (18–29, 30–59, ≥60 years), sex (men, women), SEG (higher, lower) and a pre-existing mental health problem (no, yes). Unlike the wave 1 to 3 analysis, ethnicity was not included due to reduced numbers. Interactions between the subgroups and changes in the outcomes over the waves were then tested, with significant findings only reported in the results.

The region of the UK in which a participant lived (South England, Midlands, North England, Scotland, Wales and Northern Ireland) was controlled for in each analysis. The temporal covariation was modelled with an unstructured correlation matrix, as the pattern of associations was neither fully exchangeable nor had a first-order autoregressive structure. Additionally, due to the large number of analyses, a false discovery rate (FDR) procedure (19) was applied to the between, within and

interaction p-values for all analyses. The FDR procedure places all p-values in ascending order and assigns ranks (e.g., smallest is ranked 1), then the Benjamini-Hochberg critical value for each p-value is calculated (formula $(i/m)Q$)² and the largest p value that is smaller than its critical value ($p < (i/m)Q$) is significant, along with all smaller p-values. This method adjusts for type I errors in null hypothesis testing when conducting multiple comparisons, as it controls for the expected proportion of ‘discoveries’ that are false (20).

Results

At wave 1 (March/April 2020), 3077 participants took part in the initial wave of data collection. The main analyses in this paper focus on data from wave 4 (May/June 2020) to 7 (February 2021), and this sample consisted of 2691 participants who took part in at least one survey between May 2020 and February 2021, which was 87.5% of the original sample (Table 1). Those who dropped out of the study were younger ($\chi^2 = 167.02$, $p < 0.001$, $\phi = 0.23$), more likely to be female ($\chi^2 = 21.80$, $p < 0.001$, $\phi = 0.08$) and score higher on wave 1 depressive ($\chi^2 = 34.31$, $p < 0.001$, $\phi = -0.11$) and anxiety ($\chi^2 = 46.95$, $p < 0.001$, $\phi = -0.12$) symptoms. The sample was made up of 53.5% (n=1438) women, 55.1% (n=1484) were aged between 30-59 years and 91.1% (n=2452) were from a white background. Two thirds (60.1%) were married or living with a partner, 92.9% identified as heterosexual and over half (58.6%) were employed.

Mental health outcomes from March/April 2020 (Wave 1) to February 2021 (Wave 7)

Table 2 reports the mental health outcomes (% , means) for all study participants from March/April 2020 to February 2021. Figure 2 displays the changes in rates of suicidal ideation, depressive symptoms and anxiety symptoms for the whole sample at each study wave, and Figure 3 displays the changes in in levels of defeat, entrapment, and loneliness for the whole sample at each study wave (a figure illustrating levels of wellbeing across the waves is included in the supplementary materials, Figure S1).

Visual trends across the waves suggest that mental health was poorer at the start of the pandemic, with rates of depressive symptoms, anxiety symptoms, entrapment and loneliness being the highest in March/April 2020 compared to other waves. This was followed by a decline in symptoms of poor mental health throughout the spring and summer of 2020, as documented previously (3). This appears to be followed by a gradual increase in symptoms of poor mental health from July/August 2020 to October 2020 and February 2021. The main exception to these trends is rates of suicidal ideation, which increased significantly from March/April 2020 to April/May 2020 (3), and then remained at a similar level through May/June 2020 to February 2021.

[Insert Figure 2 and 3 around here]

Statistical changes from wave 4 (May/June 2020) to wave 7 (February 2021)

Table 2 reports the statistical changes from May/June 2020 (wave 4) to February 2021 (wave 7). There were no significant changes in rates of suicidal ideation in the last week between waves, with 10.3% of the sample reporting suicidal ideation at May/June 2020 and 10.8% at February 2021. Rates

² i = the individual p-value’s rank, m = total number of tests, Q = the false discovery rate (0.05).

of suicide attempts (range: 0.7% to 0.9%) and self-harm (range: 1.2% to 1.8%) in the last week remained low.

There were no significant changes in rates of depressive symptoms between May/June 2020 (wave 4, 21.9%), and October 2020 (wave 6, 22.1%), but there was a significant increase from October 2020 (wave 6) to February 2021 (wave 7, 24.7%). Depressive symptoms at February 2021 (wave 7) were higher than at May/June 2020 (wave 4, OR = 1.18, 95% CI = 1.06, 1.32, $p = 0.003$), July/August 2020 (wave 5, OR = 1.21, 95% CI = 1.09, 1.36, $p = 0.001$) and October 2020 (wave 6, OR = 1.02, 95% CI = 1.03, 1.26, $p = 0.015$). Anxiety symptoms did not change significantly over the waves, with 17.2% meeting the cut-off for moderate anxiety in May/June 2020 (wave 4, and 16.7% meeting the cut-off at February 2021 (wave 7).

Mean scores for defeat did not change between May/June 2020 (wave 4, 3.85) and July/August 2020 (wave 5, 3.82). Defeat significantly increased from July/August 2020 (wave 5, 3.82) to October 2020 (wave 6, 4.05; OR = 1.22, 95% CI = 1.04, 1.43, $p = 0.017$), and from July/August 2020 (wave 5, 3.82) to February 2021 (wave 7, 4.16; OR = 1.36, 95% CI = 1.16, 1.60, $p < 0.001$). Similarly, mean entrapment scores did not change significantly from May/June 2020 (wave 4, 3.51) to July/August 2020 (wave 5, 3.46). Entrapment increased from July/August 2020 (wave 5) to October 2020 (wave 6, 3.68; OR = 1.21, 95% CI = 1.02, 1.44, $p = 0.029$) and from July/August 2020 (wave 5) to February 2021 (wave 7, 3.74; OR = 1.29, 95% CI = 1.08, 1.54, $p = 0.005$). The change from October 2020 (wave 6, 3.68) to February 2021 (wave 7, 4.16) was not significant.

Loneliness mean scores did not change significantly from May/June 2020 (wave 4, 5.11), July/August 2020 (wave 5, 5.05) or October 2020 (wave 6, 5.04). There was a significant increase in loneliness from July/August 2020 (wave 5, 5.05) to February 2021 (wave 7, 5.16; OR = 1.10, 95% CI = 1.02, 1.19, $p = 0.019$) and from October 2020 (wave 6, 5.04) to February 2021 (wave 7, OR = 1.11, 95% CI = 1.03, 1.19, $p = 0.008$). Mental wellbeing scores decreased from July/August 2020 (wave 5, 23.45) to October 2020 (wave 6, 23.45; OR = 0.75, 95% CI = 0.58, 0.96, $p = 0.02$).

[insert Table 2 around here]

Subgroup mental health outcomes: sex, age, socio-economic grouping, and pre-existing mental health condition

Consistent with the previous findings, particular subgroups reported worse overall mental health at each wave. All group comparison findings are included within Table 3, with the group differences reported in Tables S1 to S4 in the supplementary materials.

From May/June 2020 (wave 4) to February 2021 (wave 7), young adults (18-29 years) reported higher suicidal ideation, depressive symptoms, anxiety symptoms, defeat, entrapment and loneliness, along with lower wellbeing, compared to both 30-59 year olds and 60+ year olds. Additionally, those aged 30-59 years old reported higher rates of suicidal ideation, depressive symptoms, anxiety symptoms, defeat, entrapment and loneliness compared to 60+ year olds. Women also reported higher rates of mental ill-health than men on all outcomes, except for suicidal ideation which was not statistically different (Table 3).

Respondents who reported having a pre-existing mental health condition had consistently higher rates of suicidal ideation, depressive symptoms, anxiety symptoms, defeat, entrapment and loneliness compared to those with no pre-existing mental health condition, and similarly wellbeing scores were lower for this group. Those from the lower SEG also reported higher depressive symptoms, anxiety

symptoms, defeat, entrapment, loneliness, and lower wellbeing, but did not report any differences in rates of suicidal ideation.

[insert Table 3 around here]

Changes across the waves by subgroup

For each of the subgroups, there were no significant differences in changes over time in anxiety symptoms, defeat, loneliness or wellbeing. Although 20.2% of young adults reported suicidal ideation by February 2021 (wave 7), compared to 17.1% in May/June 2021 (wave 4), this increase was not significant in the MI GEE analysis (OR = 0.80, 95% CI = 0.57, 1.12, $p = 0.203$). It is worth noting, however, that suicidal ideation at wave 7 was highest rate reported by young adults across the 7 waves.

From October 2020 (wave 6) to February 2021 (wave 7), depressive symptoms increased for those with no pre-existing mental health condition (wave 6 = 13.4%, wave 7 = 17.3%; OR = 0.76, 95% CI = 0.60, 0.96, $p = 0.021$). Compared to 30-59 year olds, entrapment increased from May/June 2021 (wave 4, 4.32) to October 2020 (wave 6, 4.47) for 18-29 year olds (OR = 0.66, 95% CI = 0.44, 0.999), $p = 0.05$). Entrapment also increased for women from May/June 2021 (wave 4, 4.00) to October 2020 (wave 6, 4.34) compared to men (OR = 0.72, 95% CI = 0.53, 0.98, $p = 0.038$).

Discussion

The aim of the current study was to examine the mental health and wellbeing of a sample of adults from across the UK during the COVID-19 pandemic. Specifically, data are presented that cover a period of almost 12 months, during which there an initial lockdown and then gradual easing of restrictions, followed by the second wave of COVID-19 resulting in two national lockdowns. Data from the early phase of the pandemic (March/April 2020 to May 2020, waves 1 to 3) suggest that mental health improved as restrictions eased (3). Evidence suggests that from May/June 2020 (wave 4) to July/August 2020 (wave 5), when restrictions in the UK continued to ease, there were no significant changes in the mental health indicators. As most mental health indicators had improved by late April/May 2020, this suggests that there was not much fluctuation in mental health outcomes during the during the late spring and summer months. This is consistent with findings from a systematic review indicating an overall improvement in rates of mental health symptoms from March-April 2020 to May-June 2020 (6). The present study further suggests that when restrictions increased, from July/August 2020 to October 2020 and again to February 2021, with the implementation of a national lockdown, there was clear evidence of a worsening of mental health. Specifically, depressive symptoms and loneliness increased from October 2020 (wave 6) to February 2021 (wave 7), and feelings of defeat and entrapment increased from July/August 2020 (wave 5) to October 2020 (wave 6), and this increase persisted to February 2021 (wave 7), and mental wellbeing decreased from July/August 2020 (wave 5) to October 2020 (wave 6). Rates of suicidal ideation and anxiety symptoms did not change over these waves, although there had been a rise in suicidal ideation in the first 6 weeks of the pandemic.

Several subgroups reported worse mental health outcomes. Specifically, young adults were higher on all mental health indicators, including higher rates of suicidal ideation, depressive and anxiety symptoms at each wave, compared to those who were 30-59 years, who in turn reported higher rates than those who were 60+ years. By February 2021 (wave 7), one fifth (20.2%) of young adults reported experiencing suicidal ideation in the previous week, and although this increase was not statistically significant (from 17.1% at May/June 2020, wave 4), it is concerning as it is the highest rate

reported across the 7 waves. Additionally, young adults reported an increase in feelings of entrapment from May/June 2020 (wave 4) to October 2020 (wave 6), which is a recognised risk factor in the development of suicidal ideation (21). Women reported worse mental health outcomes than men across most indicators, except for suicidal ideation; and entrapment also increased for women from May/June 2020 (wave 4) to October 2020 (wave 6). Those from a more disadvantaged background were also higher on all mental ill-health indicators compared to those from more advantaged backgrounds, except for suicidal ideation. Across every indicator, those with a pre-existing mental health condition reported the worst mental health outcomes, although, interestingly, rates of depressive symptoms increased from October 2020 (wave 6) to February 2021 (wave 7) in respondents with no pre-existing mental health condition.

Implications

From May/June 2020 to February 2021, approximately one in ten respondents reported experiencing suicidal ideation in the past week (May/June 2020, wave 4 = 10.3%, February 2021, wave 7 = 10.8%). Although suicidal thinking did not increase over this time frame, it still represents an increase from 8.2% at March/April 2020 (3), and suggests that rates of suicidal ideation did not improve with the changing of restrictions. A recent meta-analysis proposes that rates of suicidal thoughts and behaviours have been higher during the COVID-19 pandemic compared to pre-pandemic levels (22). Thus far, there is little evidence that this risk has translated into suicide deaths (4), although continued monitoring and vigilance is required.

Findings indicate that overall mental health deteriorated during the second COVID-19 wave and this coincided with a period of increased government restrictions. Specifically, depressive symptoms increased, with nearly a quarter (24.7%) of respondents at February 2021 (wave 7) meeting the cut-off for moderate depressive symptoms. In contrast, anxiety symptoms did not fluctuate significantly over the waves, with around one sixth (e.g., February 2021 = 16.7%) meeting the cut-off for moderate anxiety from May/June 2020 (wave 4) to February 2021 (wave 7). The UCL COVID-19 Social Study longitudinal UK study (23) found anxiety and depressive symptoms decreased in the initial period after lockdown as people adjusted to the measures, which aligns with the findings from waves 1 to 3 of the current study (3). The findings here suggest that subsequent lockdowns have had a further impact upon people's mental wellbeing, leading to an increase in depressive symptoms, loneliness, defeat, and entrapment, and a decrease in wellbeing. Particular subgroups maybe at higher risk, including younger people and women, with these higher risk subgroups identified in the UCL study investigating trajectories of depression and anxiety across the pandemic (24). Interestingly, respondents with no pre-existing mental health condition reported an increase in depressive symptoms from October 2020 (wave 6) to February 2021 (wave 7), suggesting that those who were previously mentally healthy may be increasingly affected.

Feelings of defeat and entrapment also increased, with young adults and women in particular reporting an increase in entrapment. These factors are key components of the Integrated Motivational-Volitional (IMV) model of suicidal behaviour (25), with evidence suggesting that they are instrumental to the emergence of suicidal thinking (26). Although suicidal ideation did not increase further, as established precursors for suicidal thinking have increased, care is needed to continue to monitor for suicide risk. Additionally, loneliness increased over time, potentially due to the social restrictions put in place during the lockdowns. This is concerning as loneliness is also a risk factor for future suicidal thoughts and behaviour, particularly for younger people and women (27), and therefore public health interventions may be needed to buffer the impact that loneliness may have in the future.

Limitations

Similar to other survey research, there are several limitations to this study design. The recruitment method excluded those who do not have access to digital means, and therefore may have led to some selection bias. The measures are all self-report, and do not allow for the monitoring of psychiatric disorders. Although the sample at wave 1 was nationally representative, those who dropped out at subsequent waves were younger, female and scored more poorly on most mental health indicators, therefore, the current results may provide an under-estimation of the true effects. It should be noted that analyses used here to test the statistical significance of changes over the waves and differences between subgroups (such as p-values and 95% confidence intervals) assume the use of probability samples, whereas we have used a quota sample. Further research could use qualitative methods to enhance understanding of the mechanisms behind these changes in mental wellbeing, helping to mitigate the adverse impact on mental health.

Conclusions

In conclusion, this study provides evidence that after an initial improvement in the mental health and wellbeing of the UK population from March 2020 to May 2020, there was a notable deterioration from July/August 2020 to February 2021, a period that coincided with a second wave of COVID-19 and a national lockdown. Young adults, women, those who are more socially disadvantaged and individuals with a pre-existing mental health condition consistently reported the worst mental health outcomes. It is essential to continue to monitor the mental health and wellbeing of the UK population, and to put in place robust public health actions to mitigate the impact upon longer-term mental health and wellbeing.

References

1. Holmes EA, O'Connor RC, Perry VH, Tracey I, Wessely S, Arseneault L, et al. Multidisciplinary research priorities for the COVID-19 pandemic: a call for action for mental health science. *Lancet Psychiatry*. 2020.
2. O'Connor DB, Aggleton JP, Chakrabarti B, Cooper CL, Creswell C, Dunsmuir S, et al. Research priorities for the COVID-19 pandemic and beyond: A call to action for psychological science. *British Journal of Psychology*. 2020;111(4):e12468.
3. O'Connor RC, Wetherall K, Cleare S, McClelland H, Melson AJ, Niedzwiedz CL, et al. Mental health and well-being during the COVID-19 pandemic: longitudinal analyses of adults in the UK COVID-19 Mental Health & Wellbeing study. *The British Journal of Psychiatry*. 2021;218(6):326-33.
4. Pirkis J, John A, Shin S, DelPozo-Banos M, Arya V, Analuisa-Aguilar P, et al. Suicide trends in the early months of the COVID-19 pandemic: an interrupted time-series analysis of preliminary data from 21 countries. *The Lancet Psychiatry*. 2021;8(7):579-88.
5. Statistics OfN. Coronavirus (COVID-19) Infection Survey technical article: waves and lags of COVID-19 in England, June 2021 2021 [Available from: <https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/conditionsanddiseases/articles/coronaviruscovid19infectionsurveytechnicalarticle/wavesandlagsofcovid19inenglandjune2021>].
6. 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 in 2020. *Journal of Affective Disorders*. 2022;296:567-76.
7. Prati G, Mancini AD. The psychological impact of COVID-19 pandemic lockdowns: A review and meta-analysis of longitudinal studies and natural experiments. *Psychological Medicine*. 2021;51(2):201-11.
8. Fancourt D, Bu F, Wan Mak H, Paul E, Steptoe A. Covid-19 Social Study: Results Release 31. February 2021.
9. Löwe B, Kroenke, K., Herzog, W., Gräfe, K. Measuring depression outcome with a brief self-report instrument: sensitivity to change of the Patient Health Questionnaire (PHQ-9). *Journal of affective disorders*. 2004;81:61-6.
10. Spitzer RL, Kroenke, K., Williams, J.B., & Lowe, B. . A brief measure for assessing generalized anxiety disorder: the GAD-7. *Archives of Internal Medicine*. 2006;166:1092-7.
11. Kroenke K, & Spitzer, R.L. . The PHQ-9: A new depression diagnostic ans severity measure. *Psychiatric Annals*. 2002;1:509-15.
12. Griffiths AW, Wood AM, Maltby J, Taylor PJ, Panagioti M, Tai S. The Development of the Short Defeat and Entrapment Scale (SDES). *Psychological Assessment*. 2015;27(4):1182-94.
13. De Beurs D, Cleare S, Wetherall K, Eschle-Byrne S, Ferguson E, O'Connor DB, et al. Entrapment and suicide risk: The development of the 4-item Entrapment Scale Short-Form (E-SF). *Psychiatry Research*. 2020;284.
14. Fat LN, Scholes S, Boniface S, Mindell J, Stewart-Brown S. Evaluating and establishing national norms for mental wellbeing using the short Warwick-Edinburgh Mental Well-being Scale (SWEMWBS): findings from the Health Survey for England. *Quality of Life Research*. 2017;26(5):1129-44.
15. Hughes ME, Waite LJ, Hawkey LC, Cacioppo JT. A short scale for measuring loneliness in large surveys - Results from two population-based studies. *Res Aging*. 2004;26(6):655-72.
16. NRS. National Readership Survey. Social Grade. 2016 [Available from: <http://www.nrs.co.uk/nrs-print/lifestyle-and-classification-data/social-grade/>].
17. Stata A. STATA MULTIPLE-IMPUTATION REFERENCE MANUAL RELEASE 13. 2009.
18. Gardiner JC, Luo Z, Roman LA. Fixed effects, random effects and GEE: What are the differences? *Statistics in Medicine*. 2009;28(2):221-39.

19. Benjamini Y, Hochberg Y. Controlling the false discovery rate: a practical and powerful approach to multiple testing. *Journal of the Royal statistical society: series B (Methodological)*. 1995;57(1):289-300.
20. Verhoeven KJ, Simonsen KL, McIntyre LM. Implementing false discovery rate control: increasing your power. *Oikos*. 2005;108(3):643-7.
21. O'Connor RC, Portzky G. The relationship between entrapment and suicidal behavior through the lens of the integrated motivational-volitional model of suicidal behavior. *Current Opinion in Psychology*. 2018;22:12-7.
22. Dubé JP, Smith MM, Sherry SB, Hewitt PL, Stewart SH. Suicide behaviors during the COVID-19 pandemic: A meta-analysis of 54 studies. *Psychiatry Res*. 2021;301:113998.
23. Fancourt D, Steptoe A, Bu F. Trajectories of anxiety and depressive symptoms during enforced isolation due to COVID-19: longitudinal analyses of 36,520 adults in England. *medRxiv*. 2020:2020.06.03.20120923.
24. Saunders R, Buckman JEJ, Fonagy P, Fancourt D. Understanding different trajectories of mental health across the general population during the COVID-19 pandemic. *Psychological Medicine*. 2021:1-9.
25. O'Connor RC, Cleare S, Eschle S, Wetherall K, Kirtley OJ. The Integrated Motivational-Volitional Model of Suicidal Behaviour. *The International Handbook of Suicide Prevention* 2016. p. 220 - 40.
26. Wetherall K, Cleare S, Eschle S, Ferguson E, O'Connor DB, O'Carroll RE, et al. Predicting suicidal ideation in a nationally representative sample of young adults: a 12-month prospective study. *Psychol Med*. 2021:1-8.
27. McClelland H, Evans JJ, Nowland R, Ferguson E, O'Connor RC. Loneliness as a predictor of suicidal ideation and behaviour: a systematic review and meta-analysis of prospective studies. *Journal of Affective Disorders*. 2020;274:880-96.

Authors

Corresponding author: Karen Wetherall PhD

Suicidal Behaviour Research Laboratory, Institute of Health & Wellbeing, University of Glasgow, Scotland. Email: Karen.wetherall@glasgow.ac.uk

Seonaid Cleare PhD

Suicidal Behaviour Research Laboratory, Institute of Health & Wellbeing, University of Glasgow, Scotland. Email: seonaid.cleare@glasgow.ac.uk

Heather McClelland MSc

Suicidal Behaviour Research Laboratory, Institute of Health & Wellbeing, University of Glasgow, Scotland. Email: heather.mcclelland@glasgow.ac.uk

Ambrose J Melson PhD

Suicidal Behaviour Research Laboratory, Institute of Health & Wellbeing, University of Glasgow, Scotland. Email: ambrose.melson@glasgow.ac.uk

Claire L Niedzwiedz PhD

Institute of Health & Wellbeing, University of Glasgow, Scotland. Email: Claire.niedzwiedz@glasgow.ac.uk

Ronan E O'Carroll PhD

Division of Psychology, University of Stirling, Scotland. Email: ronan.ocarroll@stir.ac.uk

Daryl B O'Connor PhD

School of Psychology, University of Leeds, England. Email: d.b.oconnor@leeds.ac.uk

Steve Platt PhD

Emeritus Professor of Health Policy Research, Usher Institute, University of Edinburgh, Scotland. Email address: steve.platt@ed.ac.uk

Elizabeth Scowcroft, PhD

Samaritans, The Upper Mill, Ewell, Surrey, England. Email: e.scowcroft@samaritans.org

Billy Watson

Scottish Association for Mental Health, 51 Wilson Street, Glasgow. Email: samhchiefexecutive@samh.org.uk

Tiago Zortea PhD

University of Oxford. The Oxford Institute of Clinical Psychology Training & Research. Email: tiago.zortea@hmc.ox.ac.uk

Eamonn Ferguson PhD

School of Psychology, Nottingham University, England. Email: eamonn.ferguson@nottingham.ac.uk

Kathryn A Robb PhD

Institute of Health & Wellbeing, University of Glasgow, Scotland. Email: Katie.robbs@glasgow.ac.uk

Rory C O'Connor PhD

Suicidal Behaviour Research Laboratory, Institute of Health & Wellbeing, University of Glasgow, Scotland. Email: rory.oconnor@glasgow.ac.uk

Data availability

The data that support the findings of this study are available from the corresponding author (K.W.), upon reasonable request.

Author contributions

R.C.O'C., K.A.R., K.W. and S.C. had the idea for the study and R.C.O'C. secured funding for the study. All authors contributed to the study design. K.W. and E.F. led the statistical analyses alongside S.C., K.W. led the drafting of the manuscript but all authors contributed to the drafting and approved the final manuscript for submission.

Funding

University of Glasgow, Samaritans, Scottish Association for Mental Health and the Mindstep Foundation.

Declaration of interest

During the conduct of the study, R.C.O'C. reports grants from the Scottish Association for Mental Health (SAMH), Samaritans, and the Mindstep Foundation; grants from National Institute for Health Research, the Medical Research Foundation, the Scottish Government, and from NHS Health Scotland/Public Health Scotland. R.C.O'C. is co-chair of the Academic Advisory Group to the Scottish Government's National Suicide Prevention Leadership Group, and is a member of the National Institute for Health and Care Excellence's (NICE) guideline development group for their new self-harm guidelines. C.L.N. reports grants from Medical Research Council, S.P. reports personal fees from Health Service Executive, Dublin, Ireland, personal fees from NHS Health Scotland, Edinburgh, Scotland, outside the submitted work. T.Z. reports being employed by the Scottish Government Scotland National Suicide Prevention Leadership Group during the conduct of the study, and reports grants from NHS Scotland Endowment Funds; and is a co-chair of the Early Career Group of the International Association for Suicide Prevention. E.F. reports grants from Pfizer Limited and Versus Arthritis, and grants from the Football Association, the Medical Research Foundation, the U. S. Army Medical Research and Materiel Command, outside the submitted work. E.S. (Samaritans) and B.W. (Scottish Association for Mental Health) are employees of two of the funders of this research. K.W., S.C., H.McC., A.J.M., R.E.O'C., D.B.O'C. and K.A.R. have nothing to disclose.

Tables and figures

Figure 1. Overview of the waves of the UK COVID-19 Mental Health & Wellbeing study and key events during the COVID-19 pandemic in the UK

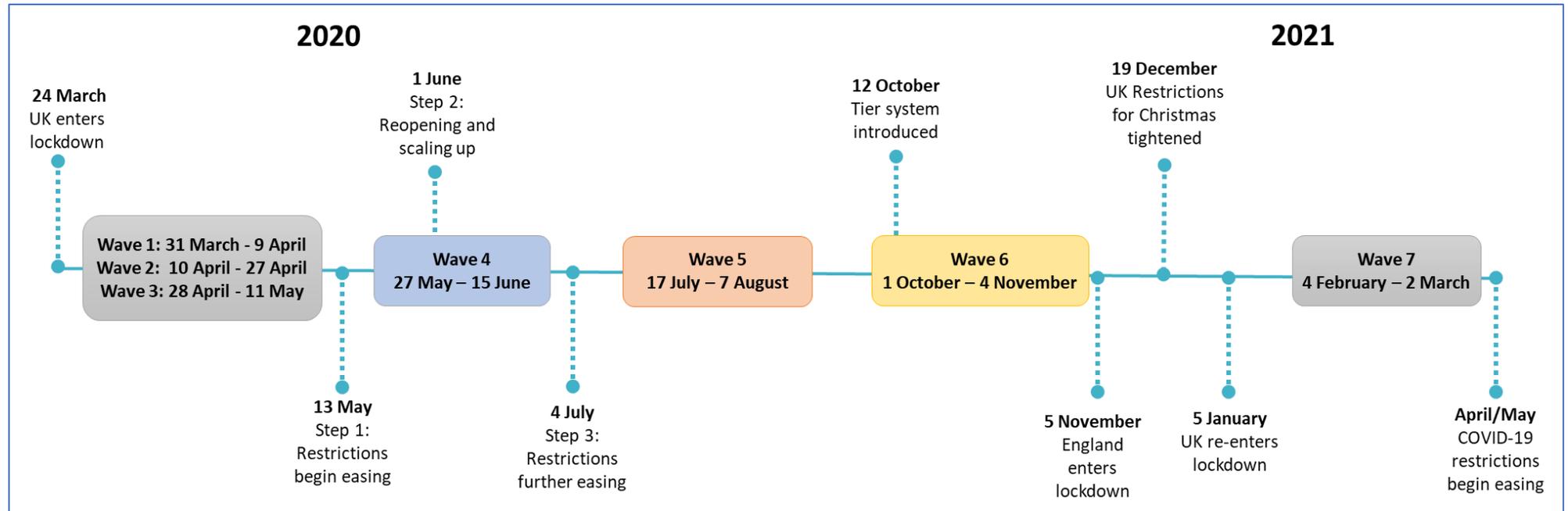


Figure 2: Percentages and 95% confidence intervals (error bars) of suicidal ideation, depressive symptoms, anxiety symptoms (%) over waves 1 – 7 of the UK COVID-19 Mental Health and Wellbeing study (n=3077)

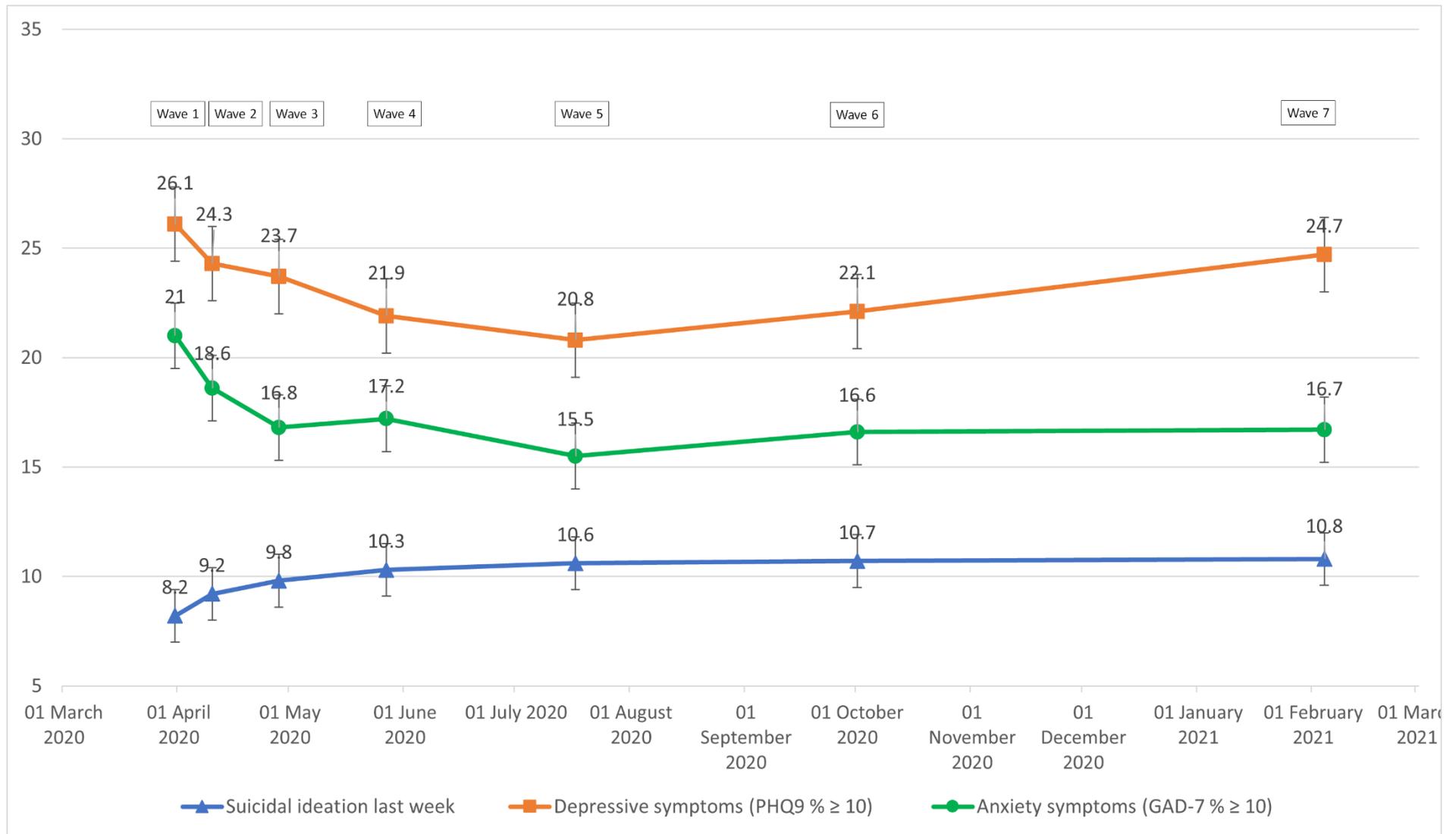


Figure 3: Means and 95% confidence intervals (Cis) of defeat, entrapment and loneliness scores over waves 1 – 7 of the UK COVID-19 Mental Health and Wellbeing study (n=3077)



Table 1. Demographic characteristics of the wave 4 – wave 7 sample (n = 2691) compared to the wave 1 sample (n= 3077)

Characteristic	Wave 1 sample n = 3077	Wave 4-Wave 7 sample n = 2691
	N (%)	N (%)
Sex at birth^a		
Men	1381 (44.9)	1251 (46.5)
Women	1692 (55.1)	1438 (53.5)
Age		
18-29 years	847 (27.5)	638 (23.7)
30-59 years	1636 (53.2)	1484 (55.1)
60+ years	594 (19.3)	569 (21.1)
Ethnicity		
White	2777 (90.5)	2452 (91.1)
Asian	162 (5.3)	135 (5.0)
Black	68 (2.2)	54 (2.0)
Mixed	52 (1.7)	35 (1.3)
Other/unknown	18 (0.6)	15 (0.5)
Region of UK		
South England	1284 (41.7)	1102 (41.0)
Midlands	401 (13.0)	362 (13.5)
North England	845 (27.5)	740 (27.5)
Scotland	350 (11.4)	316 (11.7)
Wales	136 (4.4)	118 (4.4)
Northern Ireland	61 (2.0)	53 (2.0)
Relationship status		
Married/living with partner	1834 (59.6)	1618 (60.1)
Single	962 (31.3)	820 (30.5)
Separated/ divorced/widowed	248 (8.1)	231 (8.6)
Other/prefer not to say	33 (1.1)	22 (0.8)
Sexuality		
Heterosexual	2830 (92.0)	2492 (92.9)
Gay or bisexual	220 (7.1)	177 (6.6)
Other/prefer not to say	27 (0.9)	22 (0.8)
Employment status		
Employed	1838 (59.7)	1577 (58.6)
Unemployed	358 (11.6)	322 (12.0)
Other (retired, education, homemaker)	881 (28.6)	797 (29.4)
Socioeconomic grouping^b		
High	1758 (57.1)	1535 (57.0)
Low	1319 (42.9)	1156 (43.0)
Tenure		
Own (including with mortgage)	1835 (59.6)	1635 (60.8)
Private rent	694 (22.6)	585 (21.7)
Council rent	463 (15.0)	404 (15.0)
Other	85 (2.8)	67 (2.5)
Pre-existing mental health condition		
No	2241 (72.8)	1996 (74.2)
Yes	836 (27.2)	695 (25.8)

Note: ^a W1 n= 3073, W4-W7 n=2689; ^b Categories A,B,C1= high socioeconomic group, categories C2, D, E= low socioeconomic group.

Table 2. Changes in primary outcome variables over waves 1 – 7 of the UK COVID-19 Mental Health and Wellbeing study, with odds ratio (OR) and 95% confidence interval (CIs)

	Wave 1: March/April 2020	Wave 2: April 2020	Wave 3: April/May 2020	Wave 4: May/June 2020	Wave 5: July/August 2020	Wave 6: October 2020	Wave 7: February 2021	OR [95% CI], p-value
	n=3077 % [95% CI]	n=2742 % [95% CI]	n=2604 % [95% CI]	n=2384 % [95% CI]	n=2144 % [95% CI]	n=2283 % [95% CI]	n=2224 % [95% CI]	
Suicidal ideation last week	8.2 [7.2- 9.2]	9.2 [8.1- 10.3]	9.8 [8.7- 10.9]	10.3 [9.1-11.6]	10.6 [9.3-12.0]	10.7 [9.4-12.1]	10.8 [9.5-12.2]	W4-W5 ^a = 1.05 [0.90-1.23], 0.547 W5-W6 ^b = 1.03 [0.88-1.20], 0.727 W6-W7 ^c = 1.00 [0.86-1.17], 0.959
Suicide attempts last week	0.1 [-0.3 – 0.5]	0.8 [0.4- 1.2]	0.7 [0.3- 1.1]	0.8 [0.5-1.2]	0.7 [0.4-1.1]	0.9 [0.5-1.3]	0.9 [0.5-1.3]	N/A
Self- harm last week	0.7 [0.4- 1.1]	1.8 [1.3- 2.3]	1.4 [1.0- 1.9]	1.6 [1.1-2.1]	1.2 [0.7-4.7]	1.8 [1.3-2.4]	1.5 [1.0-2.0]	N/A
PHQ-9 (% ≥ 10)	26.1[24.6-27.7]	24.3[22.7-25.9]	23.7[22.1-25.3]	21.9 [20.3-23.7]	20.8 [13.1-22.6]	22.1 [20.4-23.8]	24.7 [22.9-26.5]	W4-W5 ^a = 0.98 [0.88-1.08], 0.645 W5-W6 ^b = 1.07 [0.96-1.19], 0.222 W6-W7 ^c = 1.13 [1.03-1.26], 0.015
GAD-7 (% ≥ 10)	21[19.6-22.4]	18.6[17.1-20.1]	16.8[15.4-18.2]	17.2 [15.7-18.7]	15.5 [14.0-17.1]	16.6 [15.1-18.2]	16.7 [15.2-18.3]	W4-W5 ^a = 0.93 [0.82-1.05], 0.227 W5-W6 ^b = 1.07 [0.95-1.21], 0.255 W6-W7 ^c = 1.02 [0.91-1.15], 0.745
	M [95% CI]	M [95% CI]	M [95% CI]	M [95% CI]	M [95% CI]	M [95% CI]	M [95% CI]	
Defeat	4.11 [4.11-4.39]	4.02 [3.87-4.17]	3.92 [3.77– 4.07]	3.85 [3.69- 4.01]	3.82 [3.65- 3.99]	4.05 [3.88- 4.22]	4.16 [3.99-4.33]	W4-W5 ^a = 1.04 [0.89-1.22], 0.598 W5-W6 ^b = 1.22 [1.04-1.43], 0.017 W6-W7 ^c = 1.12 [0.96-1.30], 0.150
Entrapment	3.96 [3.81-4.11]	3.78 [3.62-3.94]	3.60 [3.44-3.76]	3.51 [3.34- 3.68]	3.46 [3.28-3.64]	3.68 [3.50-3.86]	3.74 [3.56, 3.92]	W4-W5 ^a = 1.02 [0.87-1.21], 0.770 W5-W6 ^b = 1.21 [1.02-1.44], 0.029 W6-W7 ^c = 1.07 [0.90-1.26], 0.451
Loneliness	5.24 [5.17-5.31]	5.18 [5.11-5.25]	5.15 [5.08-5.22]	5.11 [5.03- 5.19]	5.05 [4.97- 5.13]	5.04 [4.96- 5.12]	5.16 [5.08-5.24]	W4-W5 ^a = 0.97 [0.91-1.05], 0.482 W5-W6 ^b = 1.00 [0.93-1.07], 0.904 W6-W7 ^c = 1.11 [1.03-1.19], 0.008
Wellbeing	22.27 [22.05- 22.49]	22.64 [22.41- 22.87]	22.92 [22.68- 23.16]	23.33 [23.10- 23.59]	23.45 [23.18- 23.72]	23.15 [22.89- 23.42]	23.42 [23.15- 23.69]	W4-W5 ^a = 1.03 [0.81-1.32], 0.819 W5-W6 ^b = 0.75 [0.58-0.96], 0.021 W6-W7 ^c = 1.22 [0.95-1.58], 0.124

Note: Data provided for all waves, analysis is for waves 4 to 7 only, analysis for waves 1 to 3 can be found in O'Connor et al., 2021 ^a Reference group Wave 4, ^b Reference group Wave 5, ^c Reference group Wave 6

Table 3: Table of GEE output for subgroup comparisons for each variable

	Age^a OR [95% CI], p	Age^b OR [95% CI], p	Sex^c OR [95% CI], p	Mental Health^d OR [95% CI], p	SEG^e OR [95% CI], p
Suicidal Ideation	0.56 [0.42, 0.74], <0.001	0.27 [0.15, 0.46], <0.001	0.87 [0.66, 1.15], 0.323	3.01 [2.29, 3.97], <0.001	1.17 [0.90, 1.53], 0.232
Depressive symptoms	0.63 [0.51, 0.79], <0.001	0.38 [0.28, 0.53], <0.001	0.55 [0.45, 0.67], <0.001	5.11 [4.16, 6.29], <0.001	1.37 [1.13, 1.66], <0.001
Anxiety symptoms	0.62 [0.49, 0.78], <0.001	0.36 [0.25, 0.52], <0.001	0.53 [0.43, 0.67], <0.001	4.85 [3.87, 6.07], <0.001	1.32 [1.06, 0.62], 0.010
Defeat	0.45 [0.30, 0.67], <0.001	0.17 [0.11, 0.25], <0.001	0.29 [0.21, 0.40], <0.001	36.51 [26.05, 51.18], <0.001	2.37 [1.70, 3.30], <0.001
Entrapment	0.09 [0.36, 0.82], 0.003	0.16 [0.11, 0.25], <0.001	0.34 [0.24, 0.48], <0.001	44.41 [30.92, 63.80], <0.001	2.10 [1.48, 2.95], <0.001
Loneliness	0.68 [0.83, 1.31], <0.001	0.48 [0.40, 0.58], <0.001	0.54 [0.46, 0.63], <0.001	3.29 [2.78, 3.89], <0.001	1.33 [1.14, 1.55], <0.001
Wellbeing	4.05 [2.17, 7.53], <0.001	28.18 [14.82, 53.58], <0.001	3.84 [2.30, 6.42], <0.001	0.01 [0.01, 0.02], <0.001	0.44 [0.26, 0.73], 0.002

^a 18-29 years compared to 30-59 years, ^b 30-59 years compared to 60+ years, ^c women compared to men, ^d no pre-existing mental health condition compared to having a pre-existing mental health condition, ^e high socioeconomic group (SEG) compared to low SEG