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Psychological wellbeing in the English population during the COVID-19 pandemic: A series of cross-sectional surveys

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ABSTRACT

Psychological distress has been elevated during the COVID-19 pandemic. However, few studies published to date have investigated distress after the first wave of infections (Spring – Summer 2020). We investigated distress and wellbeing between April 2020 and April 2022 in England through a series of cross-sectional online surveys. People aged 16 years or over living in the UK were eligible for the surveys; for this study we selected only those living in England due to differences in restrictions between UK nations. Distress was measured using the PHQ4 (n = 60,921 responses), while wellbeing was measured using the Short Warwick-Edinburgh Mental Wellbeing Scale (n = 61,152 responses). Throughout, approximately 50%–60% of women and 40%–50% of men reported distress, higher than the 25%–30% of women, and 20%–25% of men reported in normative data. Wellbeing was also worse than population norms, with women reporting lower wellbeing than men. Rates of distress in the English population have been consistently high throughout the pandemic. Patterns of distress have broadly mirrored the pattern of restrictions and case numbers, but there are notable exceptions which indicate that other factors may play a part in population mental health.

1. Introduction

The COVID-19 pandemic has seen large increases in psychological distress. The pandemic has affected psychological distress in multiple ways. Restrictions on movement and social contact and the imposition of isolation and quarantine have all had negative psychological consequences (Brooks et al., 2020). Fear and anxiety about COVID-19 have also been significant and led to decrements in wellbeing. Other consequences of the pandemic and consequent public health measures can also affect psychological state, including effects via loss of employment, reduced income and disrupted education. These different pathways to distress are highly confounded: restrictions are generally introduced when case numbers and/or perceived threat are high. Restrictions have also fallen at certain periods in the calendar, producing further confounds or interactions with, for example, weather, that may impact mental health (Keller et al., 2005).

Psychological distress increased during the early months of the pandemic (Aknin et al., 2022). US studies found three or four-fold increases in depression symptoms from before the pandemic to March to April 2020 in nationally representative samples (Ettman et al., 2020; McGinty et al., 2020), with similar results seen in the UK (Fujiwara et al., 2020) and elsewhere (Ebrahimi et al., 2021). Worse wellbeing has also been found during the pandemic (Fujiwara et al., 2020; Helliwell et al., 2021).

Psychological distress was higher in the UK during the pandemic (March 2020 to March 2021) compared to pre-pandemic periods (Patel et al., 2022). This is mirrored in findings from the Office for National Statistics indicating that the prevalence of self-reported depressive symptoms in British adults was elevated between June and November 2020 compared to pre-pandemic findings and was still slightly higher in

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January to March 2021; rates subsequently decreased slightly up to August 2021, but remained higher than pre-pandemic levels (Office for National Statistics, 2021). To the best of our knowledge, only one study has reported wellbeing in the UK population into 2022. This study indicates that self-reported anxiety and depression started to rise in September 2020 with a second peak at the end of March 2021 (Fancourt et al., 2022). Rates then decreased until July 2021, and stayed at a low level until November 2021, when there was another peak. However, while the data are weighted, the study sample is not representative of the UK population (Fancourt et al., 2021).

Due to the lack of available data investigating psychological distress in the later stages of the pandemic, the aim of this study was to investigate psychological distress in the English population between April 2020 and April 2022.

2. Materials and methods

2.1. Design

Series of online cross-sectional surveys conducted weekly or fortnightly by BMG Research and then Savanta on behalf of the UK Department of Health and Social Care since January 2020. We analysed these as part of the CORSAIR study [the COVID-19 Rapid Survey of Adherence to Interventions and Responses study]; see Smith et al. (2021) for details of methods. For this study, we used data collected between 20 April 2020 and 13 April 2022 (waves 13 to 72).

2.2. Participants

Participants were recruited from two specialist research panel providers, Respondi (n = 50,000) and Savanta (n = 31,500). Eligibility criteria for the study were being aged 16 years or over and living in the UK. Quotas were applied based on age and gender (combined) to ensure the sample was broadly similar to the population (n ≈ 2,000 per wave). Once participants had completed the survey, they were unable to complete the subsequent three survey waves, but they could be invited to participate in the fourth subsequent survey wave onwards.

For this study, we used data collected between 20 April 2020 and 13 April 2022 (wave 13 to 72), selecting only participants who reported that they lived in England (n ≈ 1700 per wave) due to differing restrictions in UK nations. 60,921 responses (from 41,837 participants) were included in analyses of distress, while 61,152 responses (from 41,189 participants) were included in analyses of wellbeing (35 waves of data in each analysis).

2.3. Study materials

Distress was measured using the PHQ4 (Patient Health Questionnaire), a validated tool for detecting anxiety and depressive disorders (Cronbach's α = 0.92) (Kroenke et al., 2009). Higher scores are associated with increased distress. Scores of 0–2 are rated "normal." Normative data for the PHQ4 suggest that approximately 75–80% of men, and 70–75% of women show no mental distress, *i.e.* scores of 0–2 (UK, German, and Colombian samples; Batty et al., 2016; Kocalevent et al., 2014; Lowe et al., 2010). For both men and women, younger people (e.g. aged 18–44 years) show more distress than older people (45 years or older) (Batty et al., 2016; Kroenke et al., 2009; Lowe et al., 2010).

Wellbeing was measured using the Short Warwick-Edinburgh Mental Wellbeing Scale (SWEMWS), another validated tool (Ng Fat et al., 2017; NHS Scotland et al., 2008). Higher scores are associated with better mental wellbeing. Scores for the SWEMWS (7 items) can be transformed to facilitate comparison with the Warwick-Edinburgh Mental Wellbeing Scale (14 items; range 7–35; Cronbach's α = 0.90) (Stewart-Brown et al., 2009). Normative data for the SWEMWS in the UK population indicates the (transformed) mean score for women is 23.2 and the mean score for men is 23.7 (Ng Fat et al., 2017).

Data were drawn from a wider study investigating behaviours and perceptions in the UK population during the pandemic. The study rapidly responded to behavioural science questions as they arose during the COVID-19 pandemic (Rubin et al., 2022). Measures were not included in all survey waves due to rapidly evolving research questions and space limitations in the questionnaire. For this study, we only report data pertaining to psychological distress and wellbeing. Relevant questions were asked in every wave initially and then every other wave.

2.4. Ethics

This work was conducted as a service evaluation of the Department of Health and Social Care's public communications campaign and, following advice from King's College London Research Ethics Subcommittee, was exempt from requiring ethical approval.

2.5. Power

A sample size of 1,700, which was the typical figure per wave, allows a 95% confidence interval of plus or minus 2% for the prevalence estimate for a survey item with a prevalence of around 50%.

2.6. Analysis

We charted mental distress and wellbeing during the pandemic (April 2020 to April 2022) for men and women separately. For mental distress, we used the PHQ4, charting the percentage of the sample whose scores indicated distress (3 or higher). For wellbeing, we used the SWEMWS, charting mean transformed scores. We ran generalised estimating equation (GEE) analyses to investigate whether psychological distress and wellbeing changed over time, in women and men separately.

To investigate distress and wellbeing at different timepoints in the pandemic, we selected six different slices of data, at times when different restrictions were in place. Time points were: 1) first national lockdown (20 April to 6 May 2020), 2) second national lockdown (9 to 25 November 2020), 3) third national lockdown (11 January to 23 February 2021), 4) no legal restrictions on social mixing (26 July to 17 November 2021), 5) additional restrictions in place to prevent the spread of Omicron variant (6 December 2021 to 20 January 2022), and 6) Omicron restrictions removed (31 January to 13 April 2022). We ran GEE analyses to adjust for repeat respondents (distress: logistic regression, wellbeing: linear regression) to investigate whether psychological distress and wellbeing changed at different timepoints, in women and men separately.

3. Results

3.1. Respondent characteristics

The majority of respondents (wave 13 to 72) were female (53.3%, n = 56,797/106,524; 46.4% male, n = 49,381; 0.2% prefer to self-describe, n = 249; 0.1% prefer not to say, n = 97), with a mean age of 48.2 years (SD = 17.9, range 16 to over 100 years). Respondents were more likely to be white than the general population (82.4% white British ethnicity n = 87,764/106,524; 6.3% white other [compared to 86.0% in the 2011 census of England and Wales (GOV.UK, 2021)]; 2.5% mixed; 5.3% Asian or Asian British; 2.4% black or black British; 0.5% Arab or other; 0.6% prefer not to say).

3.2. Distress

Distress was higher in women than men throughout the pandemic (Fig. 1). The percentage of women showing signs of distress ranged from 49.3% (95% CI 46.1%–52.5%) in data collected 9 to 10 August 2021 to 61.4% (95% CI 58.3%–64.5%) from 26 to 27 May 2020. The percentage

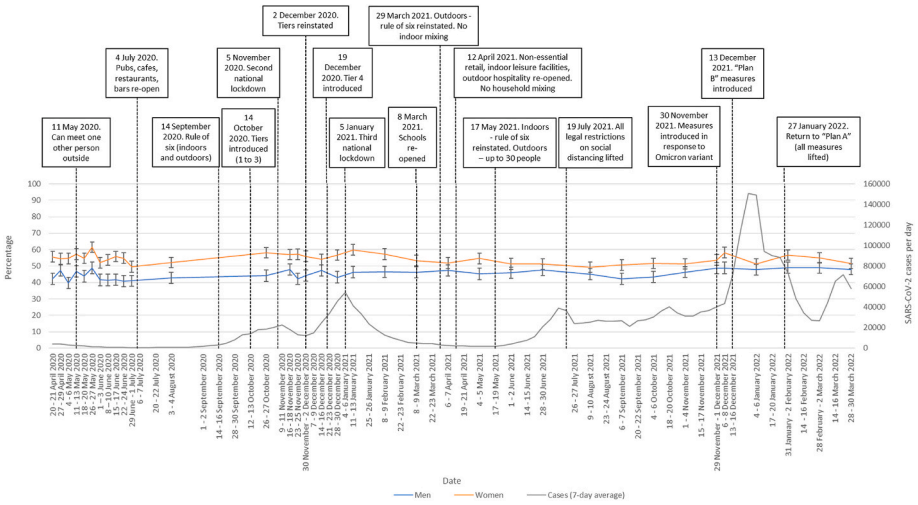

Fig. 1. Percentage of participants with signs of increased distress as measured by PHQ4, by gender, with SARS-CoV-2 case numbers for England (GOV.UK, 2021). Case rates before June 2020 are an underestimate as only selected people were eligible for testing. Error bars are 95% confidence intervals.

of men showing signs of distress ranged from 39.6% (95% CI 36.2%–43.1%) from 4 to 6 May 2020 to 49.0% (95% CI 45.6%–52.4%) from 31 January to 2 February 2022. Distress changed over time (women: $\chi^2(34) = 115.5$, $p < 0.001$; men: $\chi^2(34) = 84.2$, $p < 0.001$; see supplementary materials for full results).

Distress also varied by timepoint in the pandemic (Table 1), with distress somewhat higher during periods of greater case numbers and stricter restrictions. In women, compared to the first lockdown, distress was lower after all legal restrictions on social mixing had been lifted and when additional restrictions were in place to prevent the spread of Omicron were imposed. In men, while there was overall variation by time point, no individual time point achieved significance. Distress was highest in the first and third lockdowns (March 2020 and January 2021), with high levels of distress also being seen in December 2021 and February 2022 in line with the emergence of the Omicron variant and lifting of measures put in place to slow the spread of the variant. Distress was lowest in the summer of 2020. There were also periods where levels of distress were largely constant despite significant changes in case numbers and in restrictions, as in June to September 2021. Men and women showed slightly different patterns of distress, in particular between November 2020 and January 2021, with prevalence increasing in women but decreasing in men.

Table 1
Associations between distress and time point, between April 2020 and March 2022, in women and men separately.

	Women		Men	
Time point	Odds ratio (95% CI)	p-value	Odds ratio (95% CI)	p-value
Overall	$\chi^2(5) = 45.2$	<0.001*	$\chi^2(5) = 12.6$	<0.001*
First national lockdown (20 April to 6 May 2020)	Reference	Reference	Reference	Reference
Second national lockdown (16 to 25 November 2020)	0.99 (0.88–1.10)	0.83	0.95 (0.85–1.07)	0.42
Third national lockdown (11 January to 9 February 2021)	1.12 (0.99–1.26)	0.07	1.02 (0.91–1.14)	0.72
No legal restrictions on social mixing (9 August to 4 November 2021)	0.80 (0.72–0.88)	<0.001*	0.93 (0.84–1.03)	0.15
Additional restrictions in place to prevent the spread of Omicron variant (6 December 2021 to 6 January 2022)	0.89 (0.80–1.00)	0.04*	1.05 (0.94–1.17)	0.42
Omicron restrictions removed (31 January to 30 March 2022)	0.91 (0.82–1.01)	0.07	1.07 (0.97–1.19)	0.19

*$p < 0.05$.

3.3. Wellbeing

Wellbeing was higher in men than in women throughout the pandemic (Fig. 2). Mean transformed wellbeing scores in women ranged between 21.0 (SD = 5.1) in data collected 22 to 23 February 2021 and 22.5 (SD = 4.8) in data collected 15 to 17 November 2021. Mean transformed wellbeing scores in men ranged between 22.0 (SD = 5.2) in 21 to 23 December 2020 and 23.3 (SDs = 5.0) in 15 to 17 November 2021. Wellbeing changed over time (women: $F(34) = 5.36$, $p < 0.001$; men: $\chi^2(34) = 152.2$, $p < 0.001$; see supplementary materials for full results; the GEE failed to converge for the analysis in women, therefore we report results of a one-way ANOVA investigating the association between survey wave and wellbeing).

Wellbeing was below pre-pandemic norms throughout. Wellbeing also differed by timepoint in the pandemic (Table 2), being lower during the first and third lockdown compared to after July 2021. Wellbeing was high in both men and women in June 2020, but fell to its lowest between January and February 2021. This dip was particularly noticeable in women. Reductions in wellbeing were greater in the third lockdown than the first lockdown. Wellbeing increased at the beginning of March 2021, coinciding with the re-opening of schools in England. Between May 2021 and January 2022, wellbeing levels were high and stable, peaking in November 2021. In women, wellbeing gradually increased between June 2021 and January 2022, peaking in November 2021. Wellbeing stayed higher during Omicron restrictions.

4. Discussion

In England, psychological distress was elevated, and wellbeing lower, during the COVID-19 pandemic compared to population norms. Between April 2020 and April 2022, approximately 50%–60% of women and 40%–50% of men reported distress. This is well over the 25% indicated by normative data (Batty et al., 2016; Kocalevent et al., 2014; Lowe et al., 2010). Wellbeing was also lower compared to normative scores (Ng Fat et al., 2017). These findings replicate results of other

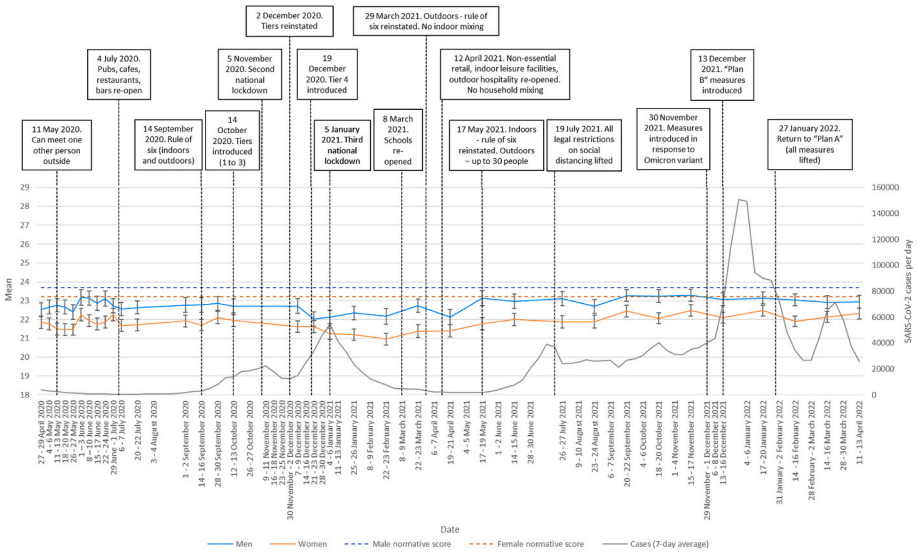

Fig. 2. Mean wellbeing scores, by gender, as measured by the SWEMWS (data transformed), with SARS-CoV-2 case numbers for England (GOV.UK, 2021). Case rates before June 2020 and from April 2022 are an underestimate as only selected people were eligible for testing. Error bars are 95% confidence intervals. The range of the y-axis was chosen to cover the 10th to the 90th percentile of values in normative data (Ng Fat et al., 2017).

Table 2
Associations between wellbeing and time point, between April 2020 and April 2022, in women and men separately.

	Women		Men	
Time point	Odds ratio (95% CI)	p-value	Odds ratio (95% CI)	p-value
Overall	$\chi^2(4) = 87.5$	<0.001*	$\chi^2(4) = 56.2$	<0.001*
First national lockdown (27 April to 6 May 2020)	0.61 (0.46–0.80)	<0.001*	0.50 (0.36–0.69)	<0.001*
Third national lockdown (25 January to 23 February 2021)	0.38 (0.30–0.49)	<0.001*	0.43 (0.32–0.58)	<0.001*
No legal restrictions on social mixing (26 July to 17 November 2021)	1.02 (0.85–1.22)	0.85	1.00 (0.81–1.24)	0.98
Additional restrictions in place to prevent the spread of Omicron variant (13 December 2021 to 20 January 2022)	1.09 (0.88–1.36)	0.43	1.04 (0.82–1.31)	0.77
Omicron restrictions removed (14 February to 13 April 2022)	Reference	Reference	Reference	Reference

*$p < 0.05$.

studies conducted earlier in the pandemic indicating that psychological distress increased during the pandemic in the UK (Fancourt et al., 2022; Patel et al., 2022; Pierce et al., 2021). Fewer studies investigated mental health after the first wave of COVID-19 infections (after summer 2020), but our data are consistent with other studies finding worse mental health (Dale et al., 2021; Vahratian et al., 2021) and life satisfaction (Fancourt et al., 2022) over winter 2020/21, while also extending the study period to April 2022.

Fluctuations in distress and wellbeing during the COVID-19 pandemic were minor. Levels of distress somewhat mirrored case numbers in England and periods of greater restrictions, however we cannot separate the influence of these two factors. There are some notable exceptions where distress and wellbeing did not follow the pattern of restrictions. For example, distress (as measured by PHQ4) increased following the re-opening of hospitality venues on 4 July 2020. Distress also increased in women after legal restrictions were lifted on 19 July 2021 and after the removal of additional restrictions put in place to prevent the spread of the Omicron variant on 27 January 2022. Furthermore, wellbeing peaked in June 2020 while the English population were still under strict lockdown measures. One reason for this could be the warm and sunny weather experienced at that time (Schultz and Tandon, 2020).

Some politicians and commentators have concluded that mental health problems are a result of lockdowns (*e.g.* Javid, 2021). However, the literature does not support a simple relationship between lockdowns and population-level psychological distress. In a review of 25 studies published in 2020, Prati and Mancini (2021) found that the psychological impact of COVID-19 lockdowns was small and highly heterogeneous. They reported effects on mental health symptoms generally, and on anxiety and depression, but no significant effect on general distress, positive functioning, social support, loneliness, negative affect or suicidal ideation.

Lockdowns are multifaceted phenomena that may impact wellbeing through different routes. These may not be inevitable consequences of any lockdown but depend on how lockdowns are carried out and what support structures are in place. For example, the greatest increases in mental health problems have been in those who are younger, female, experiencing financial difficulties, and with young children at home (Aknin et al., 2022; Vahratian et al., 2021; Yamamoto et al., 2020). Research also suggests that changes in psychological distress were higher in women, and those with lower educational attainment (Patel et al., 2022). While these factors mirror predictors of worse mental health in pre-pandemic periods (Aknin et al., 2022; Dale et al., 2021), they may be further compounded by the effects of lockdowns. For example, our data indicate that women's wellbeing declined with the introduction of the third lockdown (in which schools were shut) and increased following the re-opening of schools in March 2021. The burden of childcare in England during periods of stricter restrictions fell greatly on women (Andrew et al., 2021) and research suggests that time spent engaging in childcare or home-schooling was associated with reduced subjective wellbeing during the pandemic (Aknin et al., 2022). There is also an inevitable confound between lockdowns and the pandemic itself: distress may be a direct effect of disease spread, rather than or only because of the restrictions put in place to combat the

disease.

We found that levels of distress and wellbeing were similar across the three national lockdowns, as in other research (Patel et al., 2022). Research suggests that the population may have experienced distinct trajectories of mental health. A UK study found five distinct trajectories of mental health within the sample between April and October 2020 (very good health throughout, good health throughout, recovering [low mental health initially returning to pre-pandemic levels], low mental health throughout, and steadily deteriorating mental health) (Pierce et al., 2021). Another UK study found four trajectories for depression (low symptom severity throughout, moderate symptoms becoming severe, moderate symptoms throughout, and worsening mental health during lockdown with improvements with easing of restrictions), and five for anxiety (as before with the addition of severe initial anxiety that improved during lockdown) (Saunders et al., 2021).

Strengths of this study include that it investigates psychological distress and wellbeing over a long period of time (April 2020 to April 2022) in a large population. Limitations include that the sample included a slightly higher percentage of women than men, and that respondents were more likely to be white than the general population. We cannot be certain that the experiences of people who complete online surveys are representative of the general population. We did not have any pre-pandemic data. Wellbeing was not measured during the second national lockdown.

Rates of psychological distress in the English population have been high and stayed high during the pandemic (April 2020 to April 2022) with only minor fluctuations. Women show greater distress and lower wellbeing than men throughout, with greater fluctuations. While distress and wellbeing broadly follow case numbers in England and periods of greater restrictions, notable instances where releasing of restrictions was not mirrored by an increase in wellbeing suggest that other factors play a part.

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Author contributions

Louise E Smith: conceptualisation, data curation, formal analysis, methodology, writing – original draft. Richard Amlôt: conceptualisation, funding acquisition, methodology, writing – review & editing. Nicola T Fear: conceptualisation, funding acquisition, methodology, writing – review & editing. Susan Michie: conceptualisation, funding acquisition, methodology, writing – review & editing. G James Rubin: conceptualisation, funding acquisition, methodology, writing – review & editing. Henry WW Potts: conceptualisation, funding acquisition, methodology, writing – original draft.

Declaration of competing interest

All authors had financial support from NIHR for the submitted work; RA is an employee of the UK Health Security Agency; HWWP has received additional salary support from Public Health England and NHS England; HWWP receives consultancy fees to his employer from Ipsos MORI and has a PhD student who works at and has fees paid by AstraZeneca; NTF is a participant of an independent group advising NHS Digital on the release of patient data. At the time of writing GJR is acting as an expert witness in an unrelated case involving Bayer PLC, supported by LS. All authors were participants of the UK's Scientific Advisory Group for Emergencies or its subgroups.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jpsychires.2022.06.040.

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