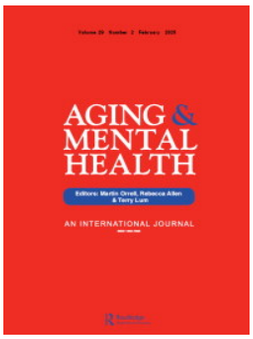

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Recovery of psychological wellbeing following the COVID-19 pandemic: a longitudinal analysis of the English longitudinal study of ageing

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ABSTRACT

Objectives: To assess changes in positive psychological wellbeing and depression before, during and after the pandemic in older people, and evaluate whether mental wellbeing had returned to pre-pandemic levels after the pandemic. We also tested whether these responses varied by age, gender, living arrangements and economic resources.

Method: We used 3999 ELSA participants aged 50+ with data during (June/July and November/December 2020), before (2012–2019) and after (2021–23) the pandemic. Three elements of positive psychological wellbeing (affective, eudaemonic, evaluative wellbeing) were assessed along with depressive symptoms. Two-way fixed-effects linear regression models were used to estimate trajectories of outcomes.

Results: Positive wellbeing declined in mid-2020, with further decreases in late 2020. These responses were related to economic prosperity and age. All aspects of positive wellbeing improved after the pandemic, with eudaemonic and evaluative wellbeing surpassing pre-pandemic levels. Conversely, the prevalence of depressive symptoms increased from 11.4% before the pandemic to 27.2% during the pandemic, but remained above pre-pandemic levels in 2021–23 (14.9%).

Conclusion: The COVID-19 pandemic significantly impacted depressive symptoms and the positive wellbeing of older people. Attention should focus on the positive aspects of healthy mental ageing in periods of societal disruptions, as specific population sectors remain particularly vulnerable.

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Depression; wellbeing; longitudinal analysis, COVID

Introduction

The COVID-19 pandemic in 2020–2021 was a global challenge, and mental health was negatively affected in many sectors of society, including older people (Santomauro et al., 2021; Schäfer et al., 2023). However, not everyone suffered impaired mental health (Sun et al., 2023). An analysis of the English Longitudinal Study of Ageing (ELSA) identified a disturbing rise in the prevalence of clinically significant depression symptoms among older adults in England - from 12.5% pre-pandemic to 28.5% by late 2020 (Zaninotto et al., 2022). Adverse effects were more pronounced in women, individuals without partners, and those with lower socioeconomic backgrounds.

It is increasingly understood that positive psychological wellbeing is not merely the mirror of negative states such as depression and anxiety; thus, people may not experience depression or anxiety, but not necessarily be happy or find purpose in their lives. Furthermore, positive psychological wellbeing is not a unitary construct, but is composed of several related experiences. It is frequently divided into three components (Steptoe et al., 2012; Steptoe et al., 2015). These include affective or hedonic wellbeing, the experience of feelings or moods such as happiness, enjoyment, and pleasure; evaluative wellbeing, a judgement of the quality or goodness of the individual's life, often assessed as life satisfaction; and eudaemonic wellbeing, a set of appraisals or meaning and purpose in life, encompassing aspects such as sense of autonomy, control, and self-actualisation (Deci & Ryan, 2008). These three components are positively correlated but have distinct characteristics (Kahneman et al., 2003). Affective wellbeing is an immediate but fluctuating emotional experience, while eudaemonic and evaluative wellbeing require introspective judgements and more extensive cognitive processing. They also show differential associations with genetic processes, personality, biological factors and health outcomes (Bartels et al., 2010; Steptoe, 2019).

It might be expected that positive wellbeing would have declined during the COVID-19 pandemic, but findings have not been consistent. Analyses of the Gallup World Poll showed little change in affective or eudaemonic wellbeing across 2019–2021 (Helliwell et al., 2021), while life satisfaction fluctuated over this period depending on the stringency of restrictions on social and commercial activity and the phase of infection (Easterlin & O'Connor, 2023). In the UK, the Office for National Statistics (ONS 2011, 2022) showed only small changes on average in ratings of positive affect, eudaemonic wellbeing and life satisfaction over this period (ONS, 2022). One reason for differences in findings may be that many studies have involved repeat cross-sectional surveys rather than longitudinal assessments, so the composition of samples varied over time (Easterlin & O'Connor, 2023; Helliwell et al., 2021a; ONS, 2022; Smith et al., 2022). Analyses of longitudinal studies have reported a decrease in life satisfaction in the UK and Thailand (Morris et al., 2023; Phulkerd et al., 2023), but an increase in happiness during the pandemic in an Italian survey (Prati & Mancini, 2023). Studies initiated during the pandemic have value but do not include pre-pandemic measures.

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The main aim of this analysis was therefore to evaluate trajectories of positive psychological wellbeing before, during, and after the pandemic in a large representative population sample of older men and women, to determine whether positive psychological wellbeing and depression had returned to pre-pandemic levels post-pandemic. There has been limited research to date on whether the mental wellbeing of the population has returned to pre-pandemic levels since vaccination has become widespread, infection levels have declined, and restrictions on daily life have been lifted (Reutter et al., 2024; Zacher & Rudolph, 2024). The second aim was to explore how these changes in psychological wellbeing and depression differed across age, gender, living arrangements (living alone or not) and economic resources, to gain comprehensive understanding as to whether there are sectors of the older population in which wellbeing has remained impaired; identifying these trajectories can highlight vulnerable groups, enabling the development of targeted interventions.

Materials and methods

Study design and population

Data were drawn from the English Longitudinal Study of Ageing (ELSA), a nationally representative study targeting individuals aged 50 and older residing in private households in England, initiated in 2002 (Zaninotto & Steptoe, 2019). It originally included 11,391 participants, selected through the Health Survey for England to accurately reflect the demographics of older English adults. The study has to date collected eleven waves of data on various health and socioeconomic factors biennially, but the sequence was interrupted by the COVID-19 pandemic. The ELSA COVID-19 Substudy was carried out in two waves to explore the psychological and socioeconomic effects of the COVID-19 crisis on older individuals. Online data collection (with telephone interviews for people who were not able to complete the study online) for this substudy was first conducted between June and July 2020, followed by a second round of data collection in November and December of the same year, achieving a substantial response rate of 75%. The next regular wave of data collection was carried out post-pandemic starting in late 2021 with a combination of face-to-face and video interviews and completed in March 2023. The majority (85.8%) of interviews took place in 2022. For the purpose of the present study, we created a longitudinal sample including 3999 core ELSA members of the COVID-19 Substudy who participated in both COVID-19 waves and in the ELSA waves preceding the pandemic (from 2012-13 to 2018-19) and following the pandemic (2021-23). All respondents provided informed consent. 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 2013. All procedures involving human subjects were approved by the South Central—Berkshire Research Ethics Committee on 22nd March 2021 (21/SC/0030).

Measures

Positive psychological wellbeing was assessed using the Office for National Statistics (ONS) wellbeing measures (ONS, 2011, 2022). These scales use a single item to measure each of the three domains of wellbeing, namely affective wellbeing ('How happy did you feel yesterday?'), eudaemonic wellbeing ('To what extent do you feel the things you do in your life are worthwhile?') and evaluative wellbeing ('How satisfied are you with your life nowadays?'). Each component is evaluated on a continuous scale ranging from 0, indicating 'not at all', to 10, signifying 'completely'. Depressive symptoms were measured with the 8-item version of the Centre for Epidemiological Studies Depression (CESD-8) scale. This scale has previously been validated against gold-standard psychiatric interviews with good sensitivity and specificity. A binary variable was established by setting a cut-off at 4 or more symptoms to denote probable instances of clinical depression that mirrors the standard threshold of 16 or more symptoms on the complete 20-item CESD scale (Steffick, 2000).

We included the following sociodemographic characteristics from ELSA COVID-19 wave 1: age (50–59, 60–74 and 75+ years), sex (men/women), ethnicity (white/other), and living alone (yes or not). We also included the following characteristics collected in wave 9 (2018/19): education ('low' = Compulsory School Leaving/'medium' = A-levels & College/ 'high' = Degree or above), employment status (employed/ retired/other including not working), and wealth tertiles. Wealth was measured with a comprehensive assessment of the participant's economic resources (e.g. financial, housing, and physical wealth) excluding pension wealth, and was categorised into tertiles. Further, we derived a binary variable indicating whether the participant had experienced COVID-19 at the first or second wave of the ELSA COVID-19-substudy, defined as being Covid positive on testing, hospitalised due to COVID-19, or reporting at least two of the three core symptoms as defined by the UK National Health Service (NHS) (i.e. high temperature, a new continuous cough, and loss of sense of smell or taste) (Iob et al., 2022).

Statistical analyses

Two-way fixed-effects linear regression models were used to estimate trajectories of the three measures of positive wellbeing and depression before, during and after the COVID-19 pandemic. This method allows for the control of unobserved variables that differ between individuals but remain stable over time (such as genetic predisposition) as well as factors that are uniform among all individuals that evolve over time (like the period effect of COVID-19 pandemic). As a result, this approach offers more robust estimates of the potential causal influence of the COVID-19 pandemic on variations in psychological wellbeing. For the analysis of depression (binary outcome), a linear probability model was selected instead of a logistic fixed-effects model because the latter would exclude individuals with unchanging scores across all waves, thus impacting both the representativeness and the statistical power of the analysis.

We also tested interaction effects between the average change during the pandemic in each outcome and age, gender, living alone and wealth, to understand whether changes in positive wellbeing and depression varied in different sociodemographic groups. All analyses were weighted to match the population estimates for age, sex, and region in England during the ELSA COVID-19 Substudy and to account for non-response to the survey.

Random forest imputation (Shah et al., 2014; Tang & Ishwaran, 2017) was used to handle missing values in the dataset (up to 8.8% overall see Supplementary tables), with ethnicity, employment status and education as auxiliary variables to strengthen the missing at random assumption.

Sensitivity analyses

We conducted several sensitivity analyses to assess the robustness of our results. The primary analyses used raw scores for each outcome variable, so we also tested standardised scores in supplementary analyses to enable direct comparisons between outcomes. Second, we re-ran all the analyses on the complete case sample. Third, we tested whether changes in the three positive wellbeing outcomes are independent of negative emotional responses, by adjusting the models for time varying depressive symptoms. Finally, we repeated the analyses on changes in positive wellbeing and depression after excluding individuals who reported a confirmed or suspected COVID-19 infection during 2020.

Results

At the first COVID-19 assessment (June-July 2020), 53% of participants were women, 94% had a white ethnic background, and nearly half were in the 60-74 age group (Table 1). Most participants were not living alone (72%); 50% were retired and three out of ten had low educational attainment. A probable COVID-19 infection was reported by 9.3%. The average ratings for affective wellbeing (happiness), eudaemonic wellbeing (life worthwhile) and evaluative wellbeing (life satisfaction) were 7.37, 7.36 and 7.01 respectively, while 19.3% of participants had significant depressive symptoms.

Table 1. Sample characteristics at index date, ELSA 2020.

	N (%) or Mean (s.e.) $N = 3999$	Range
Gender		
Men	1740 (47.3%)	
Women	2259 (52.7%)	
Age group		
52–59	583 (30.3%)	
60–74	2251 (46.8%)	
75 and over	1165 (23.9%)	
Ethnicity		
White	3869 (93.8%)	
Other	130 (6.2%)	
Living alone		
No	2870 (71.8%)	
Yes	1129 (28.2%)	
Education		
High	993 (22.1%)	
Medium	1970 (47.8%)	
Low	1036 (30.1%)	
Employment status		
Employed	998 (37.8%)	
Retired	2786 (50.0%)	
Other not working	215 (9.4%)	
Wealth (tertiles)		
1st tertile (Poorest)	1340 (41.9%)	
2nd tertile	1322 (29.8%)	
3rd tertile (Richest)	1337 (28.3%)	
Probable COVID-19 infection[a]		
No	3674 (90.7%)	
Yes	325 (9.3%)	
Happiness	7.371 (0.042)	0–10
Eudemonic wellbeing	7.362 (0.042)	0–10
Life satisfaction	7.007 (0.048)	0–10
Depressive symptoms		
% with ≥4 symptoms	680 (19.3%)	
Average total score	1.798 (0.47)	0–8

Note. Imputed data. Weighted estimates and standard errors corrected for complex survey design.
[a]Reported at any time during 2020.

Changes in positive wellbeing and depression before, during and after the pandemic

The temporal changes derived from two-way fixed effects models for each outcome are detailed in Table 2, while trends from 2012/13 onwards are presented visually in Figure 1. We observed significant deterioration in scores across all outcomes during the pandemic. Happiness ratings declined by −0.110 ($p = 0.014$), eudaemonic wellbeing by −0.121 ($p = 0.005$) and life satisfaction by −0.334 ($p < 0.001$) between 2018/19 and the early months of the pandemic, with further decrease in late 2020. However, all aspects of positive wellbeing improved post-pandemic ($p < 0.001$), and in the cases of eudaemonic wellbeing and life satisfaction, levels in 2021/23 were significantly higher than before the pandemic. Depression showed the reverse pattern; as noted previously (Zaninotto et al., 2022), the estimated proportion of individuals with significant depressive symptoms increased from 11.4% to 19.3% in the early stages of the pandemic, rising further to 27.2% in late 2020. Depression subsequently fell post-pandemic but only to 14.9%, so remained above pre-pandemic levels in 2021–2023 on average ($p < 0.001$).

Sociodemographic factors associated with changes in psychological wellbeing

To understand how changes in psychological wellbeing across the COVID-19 pandemic varied across the study sample, we tested interaction terms in the two-way fixed effects models related to age, gender, wealth. Comparison across the three age groups (50–59, 60–74, and ≥75 yrs) revealed significant differences in response by age for the three positive wellbeing outcomes ($p < 0.01$), with a less robust association for depression (Table 3). It can be seen in Figure 2 that all three components of positive wellbeing were consistently lower for individuals aged 50–59 at all time points than among older participants (Figure 2). Notably, the 50–59 yr group did not experience a reduction in happiness but experienced the greatest deterioration in depression during the pandemic. For the 75+ age group, while their average depression score was lower, their degree of recovery post-pandemic was lower compared to the other two age groups, this was true also for life satisfaction, eudaemonic wellbeing and happiness.

There was no effect modification by gender, and by wealth for depression, implying similar patterns of response among men and women for all outcomes and for wealth for depression. Depression levels were consistently higher in the poorest group at all time points, but the trajectory of changes across the pandemic was similar across the three wealth groups. Specifically, the average changes in depression scores post-pandemic compared to during the pandemic were 0.086 for the poorest group, 0.094 for the medium group, and 0.068 for the richest group. Nevertheless, there were pronounced differences related to wealth in the three components of positive wellbeing (Table S2 and Figure 3). Ratings of happiness, eudaemonic wellbeing and life satisfaction were inversely associated with wealth, so were lower among individuals in the poorest tertile at all time points.

Table 2. Changes in positive psychological wellbeing and depression over time: two-way fixed-effects models, ELSA 2012–2023.

	B	SE	*p*-value	95%CI Low	95%CI High
Happiness					
Pre-Pandemic Mean	7.481	0.027	<0.001	7.427	7.535
Early Pandemic Mean	7.371	0.028	<0.001	7.316	7.426
Late Pandemic Mean	7.181	0.027	<0.001	7.129	7.233
Post-pandemic Mean	7.492	0.029	<0.001	7.435	7.549
Change: Early Pandemic vs Pre-Pandemic	−0.110	0.044	0.014	−0.197	−0.022
Change: Late Pandemic vs Pre-Pandemic	−0.300	0.042	<0.001	−0.381	−0.218
Change: Average Pandemic vs Pre-Pandemic	−0.205	0.039	<0.001	−0.280	−0.129
Change: Late Pandemic vs Early Pandemic	−0.190	0.038	<0.001	−0.266	−0.115
Change: Post Pandemic vs Pre-Pandemic	0.011	0.044	0.793	−0.074	0.097
Change: Post Pandemic vs Early-Pandemic	0.121	0.045	0.007	0.033	0.209
Change: Post Pandemic vs Late-Pandemic	0.311	0.042	<0.001	0.228	0.394
Change: Post Pandemic vs Average Pandemic	0.216	0.039	<0.001	0.140	0.293
Eudemonic wellbeing					
Pre-Pandemic Mean	7.483	0.024	<0.001	7.436	7.531
Early Pandemic Mean	7.362	0.029	<0.001	7.305	7.419
Late Pandemic Mean	7.227	0.029	<0.001	7.170	7.283
Post-pandemic Mean	7.600	0.027	<0.001	7.546	7.654
Change: Early Pandemic vs Pre-Pandemic	−0.121	0.043	0.005	−0.206	−0.037
Change: Late Pandemic vs Pre-Pandemic	−0.257	0.042	<0.001	−0.340	−0.174
Change: Average Pandemic vs Pre-Pandemic	−0.189	0.038	<0.001	−0.263	−0.115
Change: Late Pandemic vs Early Pandemic	−0.135	0.040	0.001	−0.215	−0.056
Change: Post Pandemic vs Pre-Pandemic	0.116	0.038	0.002	0.041	0.192
Change: Post Pandemic vs Early-Pandemic	0.238	0.044	<0.001	0.152	0.324
Change: Post Pandemic vs Late-Pandemic	0.373	0.043	<0.001	0.289	0.458
Change: Post Pandemic vs Average Pandemic	0.306	0.039	<0.001	0.230	0.381
Life satisfaction					
Pre-Pandemic Mean	7.340	0.027	<0.001	7.287	7.393
Early Pandemic Mean	7.007	0.034	<0.001	6.940	7.073
Late Pandemic Mean	6.877	0.033	<0.001	6.813	6.942
Post-pandemic Mean	7.496	0.028	<0.001	7.442	7.550
Change: Early Pandemic vs Pre-Pandemic	−0.334	0.050	<0.001	−0.431	−0.236
Change: Late Pandemic vs Pre-Pandemic	−0.463	0.047	<0.001	−0.555	−0.370
Change: Average Pandemic vs Pre-Pandemic	−0.398	0.042	<0.001	−0.481	−0.316
Change: Late Pandemic vs Early Pandemic	−0.129	0.048	0.008	−0.224	−0.034
Change: Post Pandemic vs Pre-Pandemic	0.156	0.041	<0.001	0.076	0.235
Change: Post Pandemic vs Early-Pandemic	0.489	0.047	<0.001	0.397	0.582
Change: Post Pandemic vs Late-Pandemic	0.618	0.046	<0.001	0.528	0.709
Change: Post Pandemic vs Average Pandemic	0.554	0.040	<0.001	0.476	0.632
Depression					
Pre-Pandemic Probability %	0.114	0.005	<0.001	0.104	0.124
Early Pandemic Probability %	0.193	0.006	<0.001	0.182	0.204
Late Pandemic Probability %	0.272	0.006	<0.001	0.260	0.285
Post-pandemic Probability %	0.149	0.006	<0.001	0.138	0.161
Change: Early Pandemic vs Pre-Pandemic	0.079	0.009	<0.001	0.062	0.096
Change: Late Pandemic vs Pre-Pandemic	0.159	0.009	<0.001	0.141	0.176
Change: Average Pandemic vs Pre-Pandemic	0.119	0.008	<0.001	0.103	0.135
Change: Late Pandemic vs Early Pandemic	0.079	0.008	<0.001	0.063	0.095
Change: Post Pandemic vs Pre-Pandemic	0.036	0.008	<0.001	0.021	0.051
Change: Post Pandemic vs Early-Pandemic	−0.044	0.010	<0.001	−0.062	−0.025
Change: Post Pandemic vs Late-Pandemic	−0.123	0.010	<0.001	−0.142	−0.104
Change: Post Pandemic vs Average Pandemic	−0.083	0.009	<0.001	−0.100	−0.067

Note. Imputed data. Total number of observations 27933. Raw scores changes; weighted data. Pre-pandemic is 2018–2019. Early pandemic is June-July 2020. Late pandemic is November-December 2020. Post pandemic is 2021–2023.

Nonetheless, greater deterioration in positive wellbeing was experienced during the pandemic (compared to pre-pandemic) by the medium (−0.316 for happiness, −0.219 for eudaemonic wellbeing, −0.488 for life satisfaction) and richer wealth groups (−0.421 for happiness, −0.342 eudaemonic wellbeing, −0.724 for life satisfaction), followed by more pronounced recovery after the pandemic in both the medium (0.289 for happiness, 0.364 for eudaemonic wellbeing, 0.629 for life satisfaction) and richest group (0.273 for happiness, 0.384 for eudaemonic wellbeing, 0.723 for life satisfaction).

In terms of living alone or not, the only significant interaction was found for life satisfaction: people not living alone had a significant reduction in life satisfaction scores during the pandemic (from 7.52 to 7.02), but then bounced back after the pandemic (7.62 s.e.0.03) (Supplementary Figure 1). Those living alone had lower scores of life satisfaction all time points, but their rate of change did not differ significantly across these points in time.

Sensitivity analyses

Sensitivity analyses indicated that our findings were relatively robust. First, the analyses of standardised ratings indicate that there was greater deterioration in life satisfaction and depression than in happiness and eudaemonic wellbeing during the pandemic (Supplementary Table 3). The analyses of the observed rather than imputed sample showed the same pattern of results as in the main analyses (Supplementary Table 4). Third, we reanalysed positive wellbeing responses while adjusting for time-varying depression, to test whether the changes in positive psychological states were independent of negative affect. The results indicate that while the magnitude of the coefficients for changes over time diminished, the direction and significance of the findings persisted for all three positive variables (Table S5). The only exception was that the comparisons between the two pandemic time points in 2020 were no longer significant. Finally, when we limited analyses to participants who did not

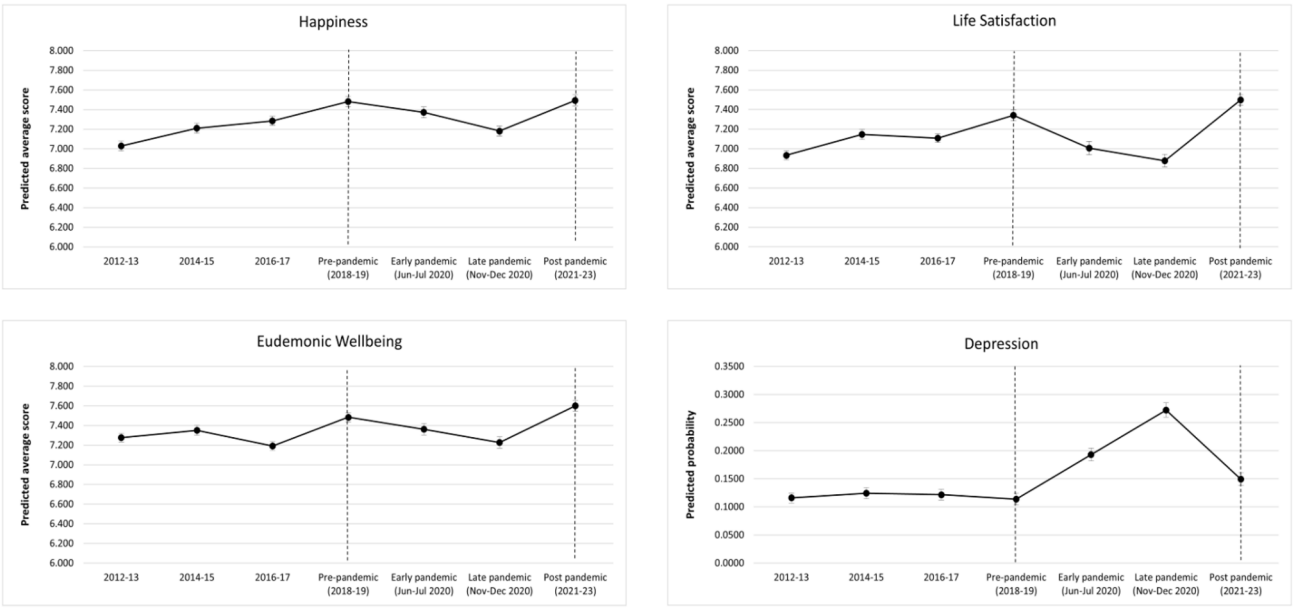

Figure 1. Estimated average scores (and 95%CI) of positive wellbeing and depression, ELSA 2012–2023.

Table 3. Interactions between sociodemographic factors and positive wellbeing and depression: two-way fixed-effects models, ELSA 2012–2023.

Sociodemographic characteristics	Happiness			Eudemonic wellbeing			Life satisfaction			Depression		
	B	SE	*p*-value	B	SE	p-value	B	SE	*p*-value	B	SE	*p*-value
Age groups												
Change*50–59	ref			Ref			ref			ref		
Change*60–74	0.009	0.021	0.664	−0.031	0.021	0.146	−0.032	0.022	0.146	−0.009	0.004	0.045
Change*75 and over	−0.065	0.024	0.008	−0.133	0.024	<0.001	−0.140	0.025	<0.001	0.001	0.005	0.763
Gender												
Change*Men	ref			ref			ref			ref		
Change*Women	−0.031	0.017	0.064	−0.028	0.017	0.099	−0.020	0.018	0.267	−0.020	0.018	0.267
Wealth tertiles												
Change*1st tertile	ref			ref			ref			ref		
Change*2nd tertile	−0.038	0.020	0.063	−0.025	0.020	0.219	−0.068	0.021	0.001	−0.002	0.004	0.602
Change*3rd tertile	−0.054	0.020	0.008	−0.072	0.020	<0.001	−0.117	0.021	<0.001	−0.002	0.004	0.672

Note. Imputed data. Total number of observations 27933. Raw scores changes; weighted data. Pre-pandemic is 2012–2019. Overall change between 2012 and 2022.

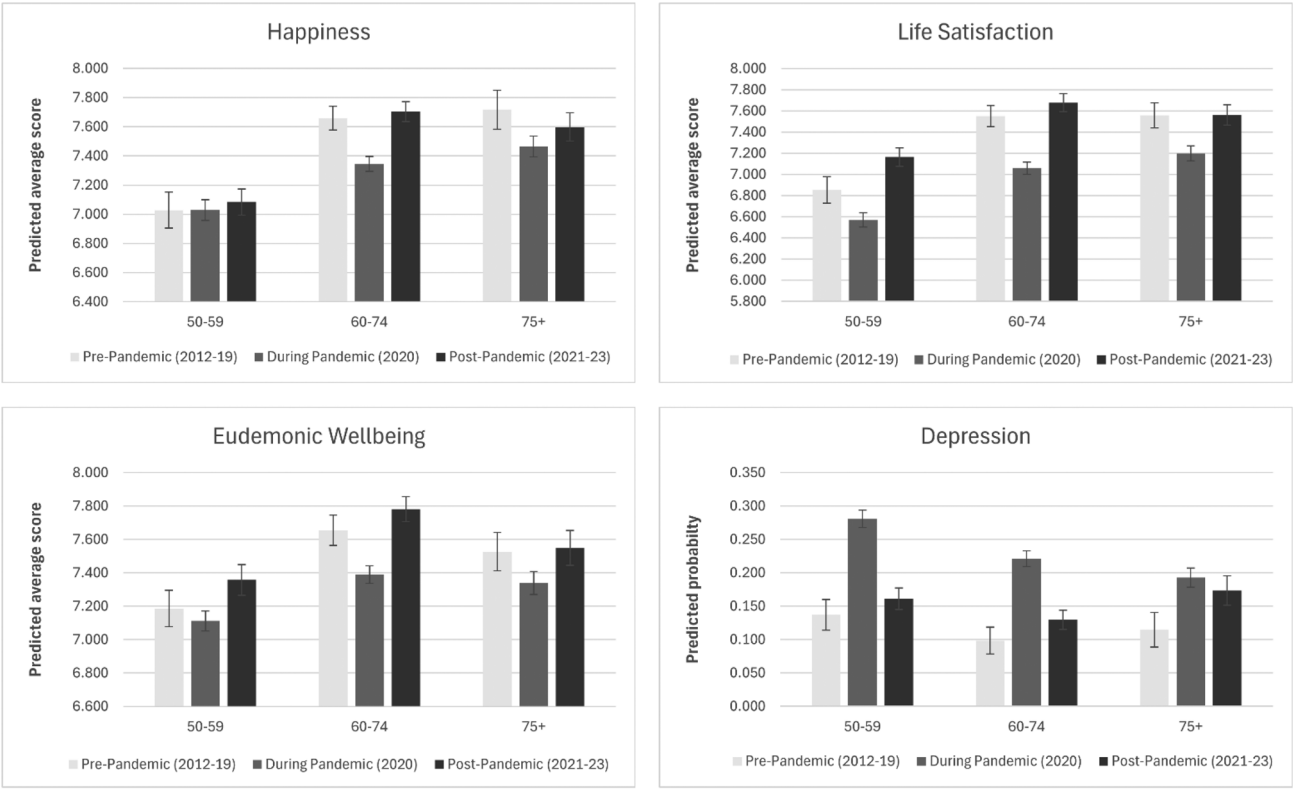

Figure 2. Estimated scores in positive wellbeing and depression by age groups, ELSA 2012–2023.

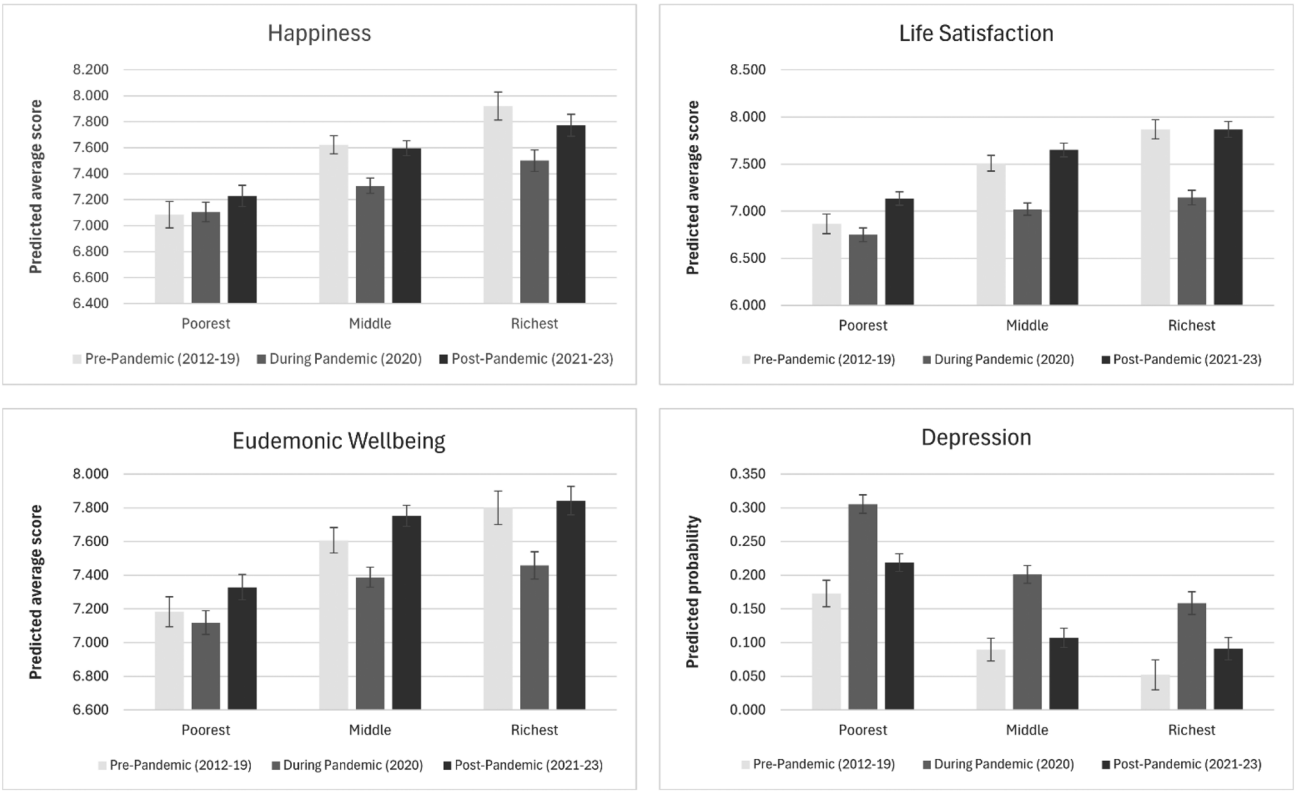

Figure 3. Estimated scores in positive wellbeing and depression by wealth tertiles, ELSA 2012–2023.

report a COVID-19 infection in 2020, results were very similar to those in the main analyses (Table S6).

Discussion

Our findings from a nationally representative sample of older people living in England document the substantial impact of the COVID-19 pandemic on positive psychological wellbeing and depressive symptoms among older men and women in England. The study demonstrated deterioration in happiness, eudaemonic well-being and life satisfaction, with greater reductions later in the pandemic (Nov/Dec 2020) than in earlier phases. Positive psychological wellbeing bounced back in 2021/2023 to higher levels, and in the cases of eudaemonic wellbeing and life satisfaction were greater than in the pre-pandemic period. The reduction in the prevalence of depression after the pandemic ended was only partial, suggesting a need for continued mental health support, particularly for those who were most affected. We also found differences in these trajectories related to age and economic resources (for positive psychological wellbeing and not depression).

Previous studies have been inconsistent in demonstrating deterioration in positive psychological wellbeing during the pandemic (Helliwell et al., 2021a; ONS, 2022; Smith et al., 2022). This may be due in part to the use of repeat cross-sectional surveys, and our within-individual methodology may have been able to identify more consistent trajectories in wellbeing. The positive psychological wellbeing results mirror well-documented increases in measures of mental ill-health such as depression and anxiety during the pandemic (Santomauro et al. 2021; Schafer et al. 2023). However, it is notable that the trajectories of positive wellbeing were maintained after adjustment for simultaneous assessments of depressive symptoms (Table S4). This is consistent with previous findings indicating that links between positive psychological wellbeing and health outcomes are independent of negative mood states (Steptoe et al., 2013; 2014). However, the magnitude of reductions in affective and eudaemonic wellbeing were smaller than those for life satisfaction; for example, the decline between pre-pandemic and pandemic standardised levels of happiness (B = −0.106) and eudaemonic wellbeing (B = −0.095) compare with (B = −0.189) for life satisfaction. It appears that the global assessment of subjective wellbeing that depends on a broad appraisal of the quality of life was more adversely affected on average than feelings of happiness or sense of purpose and meaning in life. These results highlight the importance of recognising that positive psychosocial well-being is composed of multiple interconnected experiences, underscoring the need to avoid treating it as a single, unified construct.

It is notable that all measures of positive psychological wellbeing were more adversely affected in the later months of 2020 than early in the COVID-19 pandemic. Several studies of psychological wellbeing have reported conspicuous distress early in the pandemic that resolved after a few weeks (Fancourt et al., 2021; Niedzwiedz et al., 2021). This was not the case in the present analysis; we have previously shown that depression, anxiety, and loneliness all increased between June/July and November/December 2020 in this sample, and the present results confirm a similar pattern for positive wellbeing measures (Zaninotto et al., 2022). It is possible that older people were particularly affected by the emerging understanding in late 2020 that the pandemic was not rapidly dissipating, and that they were particularly vulnerable to the adverse health consequences of infection.

All measures of positive psychological wellbeing had recovered by the post-pandemic assessment in late 2021 to early 2023. There were significant increases in happiness, eudaemonic wellbeing and life satisfaction between both pandemic

assessments and the post-pandemic measure (Figure 1). COVID-19 infection rates decreased in the spring of 2021, and vaccinations became widely available for older people. At the time of study participation, 93% of respondents had had one vaccination, and 80% had two. In the measures of eudaemonic wellbeing and life satisfaction, ratings were greater post-pandemic than they had been in 2018/2019. This may reflect a post-pandemic boost to positive psychological wellbeing as older people were able to re-engage with activities that they found meaningful, and their quality of life improved. Future assessments will confirm whether this pattern persists.

In contrast, levels of depression did not return to pre-pandemic levels but remained somewhat elevated; the estimated probability of experiencing significant depressive symptoms was 11.4% pre-pandemic, rose to 27.2% in the later months of 2020, then fell only to 14.9% in 2021/2023. One explanation may be that there was serious disruption in medical care during the COVID-19 pandemic as resources were diverted to dealing with the infection; the slogan in the UK was 'Stay at home, protect the NHS'. This meant that care for many conditions affecting older people was interrupted, leading to late diagnosis and long hospital waiting lists.

Additionally, our sensitivity analyses affirm the robustness of our findings and the validity of our conclusions across different subsets and adjustments. This reinforces the need for policies that address both the immediate and lingering effects of the pandemic on mental health.

We saw notable age-related differences in the patterns of positive psychological wellbeing over time. Respondents in the 50-59 age group reported poorer wellbeing than older groups, and in the case of happiness ratings, little decline during the pandemic. Higher levels of positive psychological wellbeing have been previously reported among people in their late 60s and early 70s compared with 50s (Stone et al., 2010), and the pattern is replicated in this analysis. The absence of a reduction in happiness in the youngest age group may be because levels were already low before the pandemic. It is notable that the increases in depressive symptoms were larger in this group, although they also showed greater recovery after the pandemic. This pattern may reflect unique challenges faced by this age group, including midlife stressors such as financial responsibilities, caregiving roles (Price & Di Gessa, 2024), and work-related pressures (Wels et al., 2023), which could have been exacerbated during the pandemic. Their recovery post-pandemic suggests resilience or adaptation to these stressors over time, but the significant fluctuations highlight the importance of targeted interventions for this group. Among people aged 75+, we observed smaller improvements in depression and positive wellbeing (albeit similar to those aged 50-59 for happiness). The small improvements could stem from persistent vulnerabilities such as reduced social interactions, health-related limitations, or slower psychological adaptation in older adults. The data suggest that while this group may not have experienced the same acute stressors as the younger groups, the pandemic's long-term effects on their wellbeing were more enduring.

The effect modification related to wealth (for positive psychological wellbeing) indicates that affluent respondents were more adversely affected than the poorer participants; they showed larger decreases in happiness, eudaemonic wellbeing and life satisfaction than the poorest group (Figure 3). This is an interesting result, since it might have been expected that financial resources would buffer the impact of the pandemic on wellbeing. However, it is possible that individuals with more resources experienced greater disruption in their lives and in the activities that brought them happiness, meaning and satisfaction. There were fewer opportunities during the pandemic to socialise, travel, and visit venues such as restaurants and theatres. People with less disposable income may have experienced fewer changes in their activities outside the home, so their positive psychological wellbeing could have been less impaired. Finally, the trajectories of psychological wellbeing showed no significant differences between individuals living alone and those not living alone, except for life satisfaction. Among those not living alone, life satisfaction significantly declined during the pandemic but later returned to pre-pandemic levels. This pattern was not observed in those living alone, possibly because individuals living alone already had lower satisfaction scores (McElroy et al., 2023), and may have already adapted to circumstances of social isolation, making them less susceptible to the pandemic's impact on life satisfaction.

Strengths of this study include the use of a large sample of older men and women living in the community. Our within-individual methodology provided a more consistent trajectory of well-being changes than previous studies, reaffirming the complex interplay between positive psychological well-being, age, and socioeconomic status during and after the pandemic. Furthermore, analyses were weighted to account for non-response and to match the sample to the English population. By using a longitudinal sample from the English Longitudinal Study of Ageing (ELSA), which included both in-person, internet and telephone interviews, we provided a more comprehensive and representative assessment of psychological well-being and depressive symptoms across different phases of the pandemic. This approach mitigates some of the limitations noted in purely internet-based studies, offering more robust and generalisable findings (Grewenig et al., 2023). Unlike some longitudinal studies that struggled with retention during the pandemic (Zacher & Rudolph, 2024), our study stands out for its high response rates which are crucial for the validity and reliability of longitudinal research findings.

One limitation of our study lies in the measurement of positive psychological wellbeing. Constraints on assessment protocols during the pandemic prevented the use of multi-item measures. Instead, we used the ONS single-item measures of each domain that may not capture the full complexity and nuance of positive psychology. Furthermore, we only conducted two measurements in 2020 which restricts our ability to capture the dynamic fluctuations in wellbeing throughout the pandemic (Bu et al., 2023). Furthermore, our study's main findings pertain to individuals who have been vaccinated, which likely contributes to their improved wellbeing. By the time of their assessments, 93% of participants had received a COVID-19 vaccination, with 80% having received booster shots. Only a small fraction, 1.6%, had decided against vaccination, while for 5%, vaccination was not applicable, likely due to prior infection. The high vaccination rate among participants underscores the potential link between vaccination and enhanced positive wellbeing, future research should explore whether there are differences by vaccine status. Lastly, the ELSA sample lacks ethnic diversity, which may limit the generalisability of our findings to minority ethnic groups.

In conclusion, we showed that the COVID-19 pandemic had marked effects not only on negative states such as depression but also on positive psychological wellbeing among older people in England. All the main components of positive wellbeing - happiness, eudaemonic wellbeing, and life satisfaction—deteriorated during the pandemic, but rebounded afterward, often

surpassing pre-pandemic levels. However, the prevalence of depression, while reduced post-pandemic, remained above pre-pandemic levels, indicating a continued need for mental health support. The findings also highlight important differences in these trajectories related to age and financial resources, underscoring the importance of tailored support policies to address both the immediate and lingering effects of the pandemic in the older population at large, over and above the serious effects of long Covid (van der Feltz-Cornelis et al., 2024).

Disclosure statement

No potential conflict of interest was reported by the authors.

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Data availability statement

The datasets analysed are available in the UK Data Service repository as Study Numbers 5050 and 8688, https://doi.org/10.5255/UKDA-SN-5050-24; https://doi.org/10.5255/UKDA-SN-8688-3.

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