RESEARCH NOTE

Longitudinal evidence for persistent anxiety in young adults through COVID-19 restrictions [version 1; peer review: awaiting peer review]

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Abstract
The coronavirus disease 2019 (COVID-19) pandemic and related mitigation measures are associated with poorer mental health in cross-sectional and longitudinal surveys. However, it's unclear if this represents an adaptive response to an unprecedented event that is short lived, or the beginning of longer mental health problems that persist beyond the initial outbreak of the pandemic. We used data from the index generation of the Avon Longitudinal Study of Parents and Children (young people aged 26-29) to examine anxiety at the beginning of the COVID-19 pandemic (April 2020) and again once restrictions were eased (June 2020). We compared these to two pre-pandemic assessments of anxiety measured 2013/2014 and 2015/17. We found that the percentage of individuals with anxiety was almost double during the COVID-19 assessments compared to pre-pandemic levels, with 15% of individuals having anxiety at both occasions (persistent anxiety). Being female, those with pre-existing mental health conditions, a history of financial problems and those who had reported difficulties accessing mental health information were at greater risk of persistent anxiety. Our findings suggest that anxiety in response to COVID-19 is not just an initial reaction but potentially the start of a persistent problem that extends beyond the pandemic. Efforts must be made to address risk groups who could be disproportionately affected as a result of the COVID-19 pandemic and related mitigation measures.

Keywords
COVID-19, pandemic, mental health, ALSPAC, anxiety, longitudinal
Introduction
Poorer mental health during the early stages of coronavirus disease 2019 (COVID-19) pandemic and related restrictions has been reported in young adults. However, whether this is a transient reaction to an unprecedented situation or the beginning of a rise in mental health disorders that will persist beyond the pandemic is unclear. We measured anxiety in a longitudinal population cohort of young adults in the immediate periods following pandemic restrictions in the UK (April 2020), and when restrictions were eased (June 2020). We compared these with pre-pandemic assessments of anxiety in 2013/2014 and 2015/17.

Methods
We used data from pre-pandemic and COVID-19 surveys nested within the Avon Longitudinal Study of Parents and Children (ALSPAC), an ongoing longitudinal population-based study of 14,901 participants born in the south-west of England between 1st April 1991 and 31st December 1992 (now aged 27–29 years old). This study uses a subset of participants who completed two online COVID-19 questionnaires between April and June 2020. Ethical approval for the study was obtained from the ALSPAC Ethics and Law Committee and Local Research Ethics Committees. All participants gave consent to take part in the study. This project was approved by the ALSPAC executive committee (B3506).

Anxiety in 2013/2014 and April/June 2020 was measured using the Generalised Anxiety Disorder Assessment (GAD-7), a seven-item instrument measuring generalised anxiety disorder (GAD) symptoms within the last two weeks. Scores range between 0–21 and we used a threshold of ≥10 to determine probable anxiety, which has good sensitivity and specificity for a GAD diagnosis. We supplemented this with anxiety assessed in 2015/17, using the Clinical Interview Schedule – Revised (CIS-R), which uses ICD-10 criteria to derive a diagnosis of GAD using similar questions to GAD-7.

We compared the prevalence of pre-pandemic anxiety in 2013/14 and 2015/17 with COVID-19 anxiety during COVID-19 restrictions in the UK (April 2020) and when restrictions were eased (June 2020). We also estimated absolute prevalence and prevalence ratios for scoring ≥10 on the GAD-7 at both COVID-19 assessments (persistent anxiety) for specific groups who could be at greater risk. Ratios were estimated using multinomial logistic regressions using StataSE, version 15 (StataCorp LLC).

Results
Data were available for 2850 participants in April 2020 and 2571 participants in June 2020. Complete data for both COVID-19 questionnaires were available for 2069 individuals (mean age=27.59 years, SD=0.54).

The percentage of young adults with anxiety in April 2020 (24.4% [95% CI, 22.8%-26%]) and June 2020 (23.8% [95% CI, 22.2%-25.3%]) were similar and almost double compared to pre-pandemic estimates made in 2013/14 (13% [95% CI, 11.9%-14.2%]) and 2015/17 (9.8% [95% CI 8.9%-10.7%]), see Figure 1.

The absolute prevalence of persistent anxiety by specific groups is shown in Figure 2. Compared to no anxiety at either

Figure 1. Prevalence of pre-pandemic and COVID-19 (during and after restrictions) anxiety in young adults. Data on anxiety were collected in 2013/14 with GAD-7 (n=3339), 2015/17 with CIS-R (n=3957), April 2020 with GAD-7 (n=2850) and June 2020 with GAD-7 (n=2571). Inferences do not vary when restricting to complete case. Restrictions in the UK were introduced on 24th March 2020 (lockdown, restricted movement imposed), with an easing of restrictions introduced between 10th – 14th May 2020 (unlimited daily exercise, more freedom of movement, ability to meet one member of another household in open spaces). Further easing of restrictions were introduced on 1st June 2020 (some schools and shops reopen, overnight stays away from home, larger gatherings of no more than 9 people permitted). April 2020 data was collected between 9th April and 14th May, in the immediate period following restrictions in the UK. June 2020 data was collected between 26th May and 4th July 2020. The GAD-7 examines anxiety symptom within the preceding two weeks, so are capturing the effects of restriction and then subsequent easing. Prevalence estimates did not differ within June (i.e., the comparing those who responded in late May compared to early or late June).
COVID-19 questionnaire, being female (PR=3.2 [95% CI, 2.3-4.5]), having pre-pandemic financial problems (PR=2.8 [95% CI, 1.9-4.1]), pre-existing mental health conditions (PR=5.7 [95% CI, 4.3-7.7]) and pre-pandemic difficulties accessing mental health services (PR=3.0 [95% CI, 2.2-3.9]) was associated with greater prevalence ratios of persistent anxiety. Prevalence ratios of persistent anxiety did not vary between health care workers and non-health care workers.

Discussion
The prevalence of anxiety in young adults after easing COVID-19 restrictions has remained high; it is still almost double compared pre-pandemic levels. This suggests that higher anxiety due to COVID-19 and associated restrictions is more than just an immediate reaction that is short lived, but maybe the start of a much more persistent problem that extends beyond the pandemic. Experiencing high levels of anxiety for an extended period is associated with both physiological and psychological costs that may not be easy to reverse.

Women, those with pre-existing financial problems, those with mental health conditions and those reporting difficulties accessing services appear disproportionately affected in terms of persistent anxiety. It is suggested that provisions could be made to prioritise these groups for treatment and support in efforts to avoid heightened morbidity.

Data availability
ALSPAC data access is through a system of managed open access. The steps below highlight how to apply for access to ALSPAC data.

1. Please read the ALSPAC access policy which describes the process of accessing the data in detail, and outlines the costs associated with doing so.

2. You may also find it useful to browse the fully searchable research proposals database, which lists all research projects that have been approved since April 2011.

3. Please submit your research proposal for consideration by the ALSPAC Executive Committee. You will receive a response within 10 working days to advise you whether your proposal has been approved. If you have any questions about accessing data, please email alspac-data@bristol.ac.uk

Contributors
ASFK, RMP, DAL and NJT contributed to the conception and design of the study. ASFK, RMP, DS, KN, DAL, DP and NJT contributed to the organisation of the conduct of the study. ASFK carried out the study (including acquisition of data).
ASFK analysed the data. ASFK drafted the initial output. All authors contributed to the interpretation of data. All authors have read and approved the final version of the manuscript. ASFK will serve as guarantor for the contents of the paper.

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References