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Richard Freund
University of Oxford

Marta Favara
University of Oxford and IZA

Catherine Porter
Lancaster University

Douglas Scott
University of Oxford

Duc Le Thuc
Vietnam Academy of Social Sciences

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ISSN: 2365-9793

IZA – Institute of Labor Economics

Schaumburg-Lippe-Straße 5–9
53113 Bonn, Germany

Phone: +49-228-3894-0
Email: publications@iza.org

www.iza.org

ABSTRACT

The Mental Cost of Job Loss: Assessing the Impact on Young Adults in Vietnam*

We exploit the extensive job loss associated with the devastating fourth wave of COVID-19 in Vietnam to examine the impact of unemployment on young people's experiences of anxiety and depression. Using data from a longitudinal study with individual and survey-wave fixed effects, we show that job loss significantly increases levels of anxiety, but not depression. Specifically, job loss leads to a 5.9 percentage point increase in the probability of experiencing symptoms consistent with either mild or severe anxiety, almost doubling the pre-wave baseline. This effect is driven by individuals in the top earnings tercile who no longer live in their natal household - suggesting that the impact of job loss on anxiety is most acute among young people who are under pressure as the primary earners in their household. Perceived financial strain and food insecurity explain up to 22% of the estimated increase in anxiety. Our results support expanding mental health programmes to explicitly target young adults who have lost their job.

JEL Classification: J6, I1, I3
Keywords: mental health, job loss, Vietnam, COVID-19

Corresponding author:
Richard Freund
Oxford Department of International Development
University of Oxford
3 Mansfield Road
OX1 3TB
Oxford
United Kingdom
Email: richard.freund@qeh.ox.ac.uk

* This research was funded by the United Kingdom aid from the Foreign, Commonwealth, and Development Office (Grant no. GB-GOV-1-301108).

1. Introduction

Individuals who become unemployed often have worse mental health. Yet, identifying the causal effect of employment loss on mental health is challenging. Although numerous studies descriptively present evidence that unemployed individuals have worse mental health than employed workers (Paul and Moser, 2009), this negative correlation might be driven by reverse causality and selection bias. Several recent studies that address the endogeneity of unemployment generally find that unemployment does harm mental health (e.g., Cygan-Rehm et al., 2017, for Australia, Germany, the UK, and the United States; Baranov et al., 2022, for Pakistan; Marcus, 2013, for Germany).

However, robust empirical evidence on the effect of unemployment on mental health in low- and middle-income countries (LMICs) is scarce, largely due to the stringent requirements for rich longitudinal data. Investigating the effects of employment loss on mental health in LMICs is important, as there is an increasing body of evidence which documents a vicious cycle between mental health conditions, poverty, and diminished future employment opportunities (Haushofer and Fehr, 2014; Ridley et al., 2020). Understanding the risk factors of mental disorders is therefore crucial to informing policy interventions and helping the most vulnerable avoid a 'psychological poverty trap' (Haushofer, 2019).

It is well-documented that the COVID-19 pandemic resulted in widespread unemployment in many countries (International Labour Organization, 2021). It has also been documented that young people are more likely to lose a job and less likely to be hired during an economic recession (Forsythe, 2022), while the scarring effect of job loss may be particularly detrimental for those more recently entering the labour market (von Wachter and Bender, 2006; Arellano-Bover, 2020). Furthermore, global evidence suggests that the majority of mental disorders emerge in adolescence and early adulthood (Patel et al., 2018).

Against this backdrop, we contribute new evidence on the effect of unemployment on mental health in Vietnam. Specifically, we examine the impact of job loss during the devastating fourth wave of COVID-19 on young people's experiences of anxiety and depression. We make two key contributions. First, to the best of our knowledge, this is the first study providing robust evidence on the effect of job loss on mental health among young adults in a LMIC setting. We use data from a 20-year longitudinal cohort study, which collected detailed employment

information during the pandemic, to explore this relationship. Second, we are able to quantify the extent to which perceived financial strain and food insecurity play a role in explaining the negative effects of job loss on mental health, an important insight for understanding appropriate policy responses.

The context of our study is Vietnam. Similar to many LMICs, Vietnam is a country where mental disorders have not been adequately studied (Vuong et al., 2011) and those suffering from mental health conditions still face considerable social stigma (Nguyen, 2003). Our findings suggest that employment loss among young adults in Vietnam significantly increases levels of anxiety, but not depression. Specifically, we find that job loss during the fourth COVID-19 wave led to a 5.9 percentage point increase in the probability of experiencing symptoms consistent with either mild or severe anxiety (a 0.27 standard deviation increase). This effect is driven by individuals in the top earnings tercile who no longer live in their natal household - suggesting that the impact of job loss on anxiety is most acute among individuals who are likely to be the primary earners in their household. In accordance with previous literature, we find that financial strain and food insecurity explain up to 22% of the increase in anxiety.[2] To mitigate concerns that our results may be due to general anxiety around the COVID-19 virus rather than to employment loss, we perform robustness checks controlling for the prevalence of COVID-19 at different points in time. To control for underlying anxiety concerning the virus, we use big data information from Google Trends, relating to searches on the topic 'COVID-19 testing'. To account for non-random attrition and differences in sample characteristics, we assess the robustness of our results by employing post-stratification weights calculated using the Vietnam 2009 Population and Housing Census.

The rest of the paper is organised as follows: Section 2 reviews the evidence on the effect of unemployment on mental health, and Section 3 discusses the country context in Vietnam. Section 4 describes our data and the sample used in our analysis. Section 5 presents the empirical strategy used to estimate the change in mental health due to job loss. Our main results are reported in Section 6, with a discussion of robustness in Section 7. Section 8 presents a decomposition of the results, quantifying the extent to which perceived financial strain and

[2] We discuss what other mechanisms may underlie the relationship between job loss and mental health in Sections 8 and 9.

food insecurity play a role in explaining any negative effects of job loss on mental health. Section 9 concludes.

2. Literature Review

There is a comprehensive literature which documents that unemployed individuals typically have worse mental health than employed individuals (e.g., Murphy and Athanasou, 1999; Paul and Moser, 2009; Clark and Oswald, 1994). However, identifying the causal effect of job loss on mental health is complicated by the well-established issues of reverse causality and unobserved individual heterogeneity. For example, people who experience job loss may exhibit more mental health symptoms due to their unemployment, but those who are depressed or anxious are also significantly less likely to maintain stable employment (Burke-Miller et al., 2006; Cook, 2006; Peng et al., 2013). Consequently, cross-sectional studies are highly likely to produce biased estimates.

The more recent literature has generally utilised two techniques to address the endogeneity of unemployment (Cygan-Rehm et al., 2017). The first relies on longitudinal data to estimate fixed effects models that account for time-invariant heterogeneity (e.g., Björklund, 1985; Charles and DeCicca, 2008; Clark et al., 2001; Green, 2011; Kassenboehmer and Haisken-DeNew, 2009). The second strategy explores exogenous variation in employment from mass lay-offs during recessions, plant closures, and other large-scale employment reductions (e.g., Alam and Bose, 2022; Browning and Heinesen, 2012; Currie et al., 2015; Eliason and Storrie, 2010; Farré et al., 2018; Kuhn et al., 2009; Marcus, 2013). Generally, these studies agree that job loss harms mental health (e.g., Cygan-Rehm et al., 2017, for Australia, Germany, the UK, and the United States; Clark et al., 2001, for Germany; Farré et al., 2018, for Spain; Green, 2011, for Australia; Drydakis, 2015, for Greece; Kuhn et al., 2009, for Austria; Eliason and Storrie, 2010, for Sweden; Browning and Heinesen, 2012, for Denmark).[3] However, robust research into the effect of unemployment on mental health in LMICs is rare, mainly due to failure to address the reverse causality issue, and limited availability of data on mental health in settings where mental disorders are viewed with social stigma and mental health support is scarce or non-existent.

[3] Some studies document statistically insignificant coefficients (e.g., Schmitz, 2011, for Germany, and Salm, 2009, for the United States). However, most of the null results appear to come from a lack of power rather than the absence of an effect. See Cygan-Rehm et al. (2017) for a more detailed discussion on this issue.

Even less is known about the effects of job loss on the mental health of young adults, despite young adulthood being a particularly vulnerable phase of an individual's life. Often this is the time when they leave the safety net of their natal household, start living independently, and try to establish a career (Sawyer et al., 2018; Walker-Harding et al., 2017). Novo et al. (2000, 2001) document a negative association between unemployment and mental health among young adults in Northern Sweden, but the authors use cross-sectional data and are thus limited in controlling for endogeneity concerns. Alam and Bose (2022) examine the impact of job losses during the Great Recession on the mental health of young adults in the United States, finding that job loss among those living by themselves led to increased mental health problems. In contrast, job loss did not negatively affect the mental health of young adults still living with their parents, as they are likely not to be the household's primary income earner and are not responsible for the household's livelihood.

The COVID-19 pandemic offers a unique opportunity to analyse the impacts of job loss on mental health, as the source of unemployment is very likely to have been exogenous to the individual. In line with pre-pandemic literature, there is an increasing body of evidence suggesting that job losses during the pandemic may have impaired individuals' mental health (e.g., Griffiths et al., 2021; Posel et al. 2021; Witteveen and Velthorst, 2020). In the U.S., Guerin et al. (2021) find that adults who lost their jobs reported struggling with mental issues on more than twice as many days as those who remained employed, and McDowell et al. (2021) find that those who lost their jobs reported higher symptoms of depression, anxiety, and stress compared to participants whose employment remained unchanged. In Australia, Griffiths et al. (2021) conclude that those who experienced work loss had greater odds of psychological distress and poor mental health, and Witteveen and Velthorst (2020) utilise survey data from six European countries to show a striking positive relationship between job loss during the COVID-19 lockdown and feelings of depression and anxiety. Among young adults (aged 18-26), Ganson et al. (2021) find that job loss during the pandemic in the U.S. was associated with a greater risk of anxiety and depression.

Evidence on the effects of job loss during the pandemic on mental health in LMICs is scarcer. To the best of our knowledge, the only available evidence from the LMICs literature is that of Posel et al. (2021), Hossain (2021), and Baranov et al. (2022). Posel et al. (2021) find that adults who retained employment during the COVID-19 lockdown in South Africa had

significantly lower depression scores than those who lost employment, and Hossain (2021) finds that young people in Ethiopia, India, Peru and Vietnam - particularly women - who faced economic hardship in 2020 (job and/or income loss in the household) were more likely to experience anxiety. Lastly, Baranov et al. (2022) show that job loss within one's household during the pandemic in peri-urban Pakistan led to an increase in adult mental distress and children's depressive symptoms.[4]

However, the vast majority of the studies during the COVID-19 pandemic are unable to accurately identify the causal relationship between job loss and mental health, and only consider cross-sectional associations. While the unanticipated nature of the pandemic helps assuage reverse causality concerns, it is well-documented that vulnerable populations (such as less wealthy individuals) and women have suffered disproportionate job losses during the pandemic (Adams-Prassl et al., 2020; Dang and Nguyen, 2021; Scott et al., 2021). Many of these groups already had a higher prevalence of mental health conditions before the pandemic (Collier et al., 2020; McLean et al., 2011; Patel et al., 2018; Ridley et al., 2020), further suggesting that cross-sectional analysis is likely to be biased. The only study that goes beyond cross-sectional associations is Baranov et al. (2022), who combine longitudinal data collected just before the pandemic with follow-up data from mid-2020 to implement a difference-in-differences estimator.

In this paper, we address these methodological concerns by utilising longitudinal data which observes mental health outcomes for the same individuals both before and after job loss. We also incorporate individual and survey fixed effects to control for any unobserved time-invariant characteristics that may influence both mental health outcomes and the probability of losing work.

3. Country Context

Unlike many countries, Vietnam was exceptionally successful at limiting the spread of COVID-19 in 2020, recording just 1,465 cases throughout the entire year. This was largely achieved through a series of early, preventative measures, including the closure of nonessential

[4] Our work differs from these papers in important dimensions. Posel et al. (2021) and Hossain (2021) rely on cross-sectional associations, while Baranov et al. (2022) analyse the impact of household-level job loss on measures of psychological distress.

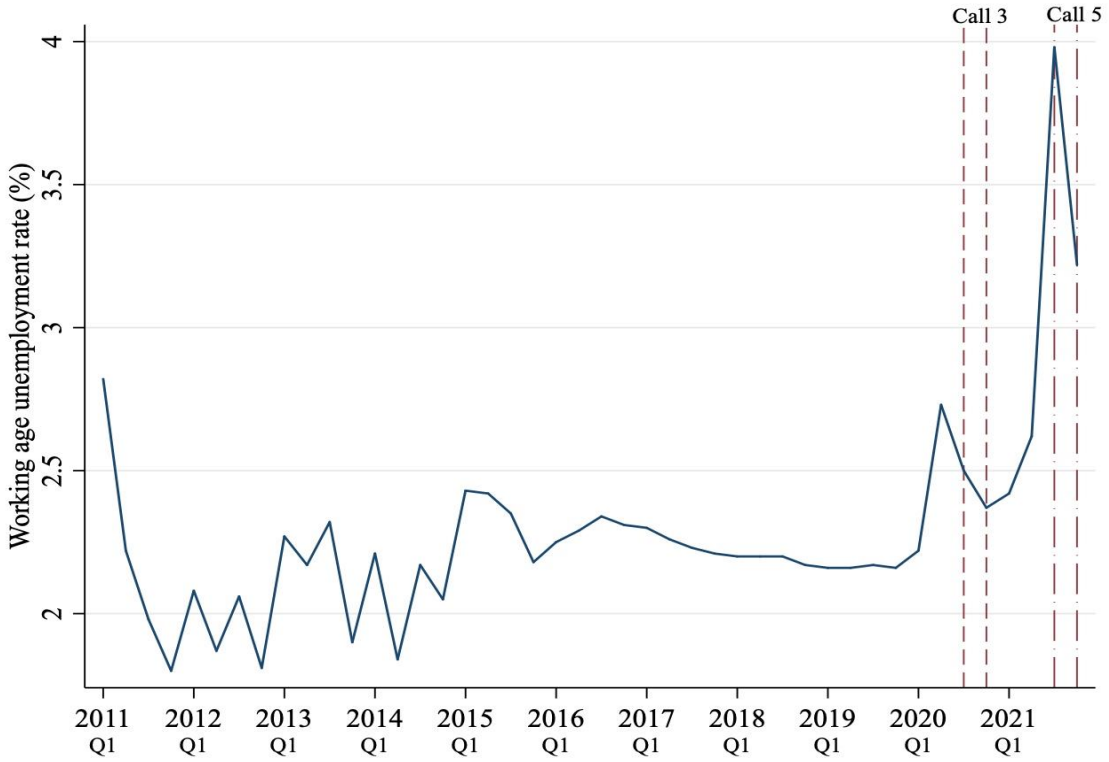
businesses, a ban on large gatherings, and extensive contact tracing (Scott et al., 2020). Given the low prevalence of the virus in 2020, Vietnam only implemented a relatively short and strict 15-day national lockdown from the 1st of April, extended to 21 days in some provinces. This lockdown, covered by Directive No. 16/CT-TTg, essentially required individuals to stay at home, except for trips to buy essential goods, such as food and medicine, and for emergencies. Gatherings of more than two people were prohibited in all public places, and outside/in front of workplaces, schools, and hospitals.

In early 2021, Vietnam was being hailed as a success story for containing both the spread of the virus and the negative economic spillovers of the pandemic (Pollack et al., 2021). In the first quarter of the year, GDP grew by 4.5% over the same period in 2020, and the number of employed workers was 49.9 million people (down just 0.4% from the same period the previous year). The unemployment rate was at 2.4% (down 0.2 percentage points from the previous quarter), and just 540 thousand people in the country lost their jobs (General Statistics Office, 2021).

However, the fourth COVID-19 wave, which started in April 2021, put an end to this narrative. The fast-spreading Delta variant seriously affected the health and lives of millions of people, disrupting business operations in many provinces - particularly in those with key economic zones. By the end of December 2021, the number of cumulative confirmed cases in the country had risen to 1.73 million (17,636 per million in the population) (Dong et al., 2020). While there was no enforced national lockdown in 2021, by the end of the third quarter, the situation had become increasingly complicated across the country, causing many provinces to implement the Directive No. 16/CT-TTg measures and close non-essential businesses and services (World Health Organisation, 2021).

These restrictions led to severe disruption and significant economic impacts. Between July and September 2021, GDP declined by 6.2% compared to the same period in 2020 (the largest quarterly decrease since records began), and the labour market faced a crisis, with a series of negative records being set (General Statistics Office, 2021). During the same period, 4.7 million people lost their jobs and unemployment rose to 4.0% (compared to 2.7% in the third quarter of 2020) - the highest increase witnessed in the past decade (see Figure 1).

FIGURE 1. The statutory working-age unemployment rate (2011-2021) and timings of Young Lives phone surveys



Source: Generated using labour force survey data from the Vietnamese General Statistics Office.
Notes: Statutory working age includes males from 15-59 and females from 15-54. Call 3 and Call 5 refer to the third and fifth Young Lives COVID-19 phone surveys, respectively.

During the same period, the youth unemployment rate (15 to 24 years old) was 8.9%, 2.2 times higher than the statutory working-age unemployment rate, and the country recorded nearly 2.4 million young people not in employment, education, or training – an increase of 624 thousand compared to the same period the previous year.

Vietnam is an important country in which to explore the effects of job loss on mental health, as mental disorders have not been adequately studied in the country (Vuong et al., 2011) and are often faced with stigma (Nguyen, 2003). As discussed in Section 2, there is extensive research, particularly in developed countries, on the psychological implications of unemployment. However, there are very few studies which rigorously investigate how job loss affects mental health among the Vietnamese population.[5] Existing research suggests that Asian countries, including Vietnam, have a relatively low reported prevalence of mental health

[5] There are a handful of studies that look at the relationship between unemployment and mental health among certain subpopulations - such as refugees (Beiser and Hou, 2001) and war veterans (Vinokur, Caplan, and Williams, 1987).

disorders compared to the rest of the world (Kessler et al., 2007). A nationally representative epidemiological survey, conducted in 2000, found that the ten most common mental disorders collectively affected approximately 14.9% of the Vietnamese population. Among them, the most prevalent disorders were alcohol abuse (5.3%), depression (2.8%) and anxiety (2.6%). However, it is possible that, at least in part, the low reported prevalence of mental illnesses in the country are due to underreporting of mental ill health rather than the absence of psychiatric symptoms. This may be explained by a greater degree of cultural stoicism (suffering without complaint), combined with stigma associated with revealing mental illness in many Asian cultures (Steel et al., 2009; Ryder et al., 2008; Nguyen, 2003).[6]

Despite the relatively low estimated prevalence of mental disorders, existing evidence suggests that mental health conditions are more acute among young people. In 2008, the Ministry of Health and UNICEF conducted a national community-based survey among young people aged 14-25 years old and found that 28% of participants reported feeling sad or helpless to the extent that it affected their usual activities, while 22% reported feeling hopeless about their future (Le et al., 2012). Furthermore, as pre-pandemic research shows, 75% of mental health conditions develop by early adulthood (Patel et al., 2018). Monitoring the mental health of young people and the associated risk factors, is therefore critical to prevention - especially in LMICs, such as Vietnam, where mental health support is limited (Vuong et al., 2011).

4. Data

Our data comes from the Young Lives survey, a unique longitudinal cohort study following two cohorts of children in Vietnam.[7] Prior to the global pandemic, two age-cohorts of children had been visited in person on five occasions since 2002, approximately once every three years, and most recently in 2016. The 2002 sample comprised of 3,000 participants from the provinces of Lao Cai (Northern Mountains), Hung Yen (Red River Delta), Phu Yen (South Central Coast), Ben Tre (Mekong River Delta), and the City of Da Nang. The study sites were selected using a multi-stage, purposive and random sampling strategy to oversample poor

[6] It is worth mentioning that the individual fixed effects approach we implement should limit bias due to under-reporting, assuming that under-reporting is not systematically related to when the questions were asked (i.e., the probability of under-reporting is the same before or after the fourth COVID-19 wave). In contrast, simply analysing the prevalence of mental health issues due to job loss by using a cross-section survey after the fourth wave would likely underestimate the true prevalence (due to the social stigma of reporting symptoms).

[7] Young Lives also collects information on young people in Ethiopia, Peru, and India. Further details can be found at www.younglives.org.uk.

households. Hence, Young Lives is not a nationally representative survey. Comparison to national statistics data indicate that Young Lives households are generally poorer than the average Vietnamese household but, despite this, the Young Lives sample covers the diversity of children in the country in a wide variety of attributes and experiences (Nguyen, 2008).

Following the COVID-19 outbreak, a five-part phone survey was conducted over the course of 2020/21, aimed at measuring the short-term impacts of the pandemic (Favara et al., 2021). At that time, the two age cohorts were between 18-19 years old (Younger Cohort) and 25-26 years old (Older Cohort). An initial contact phone call with the Young Lives respondents took place in June-July 2020, a few months after the COVID-19 outbreak. The second and third calls took place in August-October and November-December of 2020, while the fourth and fifth calls took place in August 2021 and November-December 2021, respectively.

Attrition rates observed in the Young Lives sample have been relatively low compared to similar long-running studies. In 2016 (the last in-person survey round), the attrition rate was just 5.1% - with male respondents, individuals from the Older Cohort, and urban participants relatively more likely to have attrited (Sánchez and Escobal, 2020). Furthermore, given the long-standing relationship with the participants, the Young Lives COVID-19 phone survey had a higher response rate than most phone surveys during the pandemic. In total, 88% of the 2016 sample participated in the phone survey, a very low rate of attrition compared to similar follow-up phone surveys on longitudinal studies.[8] Males, urban participants, and individuals from poorer households were relatively less likely to participate in the phone survey.[9] Given that attrition is correlated with individual and household characteristics, we assess the robustness of our results using post-stratification weights in Section 7.

In the second, third, and fifth phone survey calls, symptoms of anxiety and depression were measured using the Generalized Anxiety Disorder-7 (GAD-7) scale and the Patient Health Questionnaire depression scale-8 (PHQ-8), respectively. The GAD-7 assesses the frequency of seven symptoms of anxiety over the past 14 days, while the PHQ-8 gauges the frequency of

[8] For example, the UK Millennium Cohort study began at a similar time to Young Lives with 18,818 participants, though only 2,645 participated in the COVID-19 survey (see https://cls.ucl.ac.uk/covid-19-survey/content-and-data/).

[9] Table A.1 in the Annex provides details on attrition for the Young Lives sample between Rounds 1–5 of the longitudinal survey, and between Round 5 and the third COVID-19 phone survey.

eight symptoms of depression over the same time period.[10] The GAD-7 and PHQ-9 have both previously been validated (Zhong et al., 2015; Nguyen et al., 2016) and used in the Vietnamese context (Collier et al., 2020; Pham Tien et al., 2021; Pollack et al., 2016). The ninth question of the PHQ (relating to suicidal thoughts) was dropped due to ethical concerns about how to provide support, and the scales were slightly adapted for administration during a phone survey.[11] For each item in each scale, we asked participants whether the symptom had been experienced (Yes/No), and, if 'Yes', we then asked about the frequency. The frequency was reported using a 3-item Likert scale ranging from 1 'Less than half the days', to 2 'more than half the days' to 3 'nearly every day'.

For both anxiety and depression, we create two different dependent variables. First, by summing up the frequency of all symptoms, we generate a continuous raw score, which has a maximum value of 21 for the GAD-7 and 28 for the PHQ-8. Second, we generate a binary variable where 0 indicates no/minimal anxiety (or depression) and 1 indicates the presence of symptoms consistent with at least mild anxiety (or depression). For the binary variables, a cut-off of ≥ 5 was used to represent the presence of "at least mild symptoms" of anxiety (Spitzer et al., 2006) or depression (Kroenke et al., 2009).

During calls 2, 3, and 5, detailed information was also collected on the participant's employment status in the week before they were interviewed. Retrospective information about employment before the pandemic (January-February 2020) was also collected in the second survey call.[12] In each time period, we create a dichotomous indicator of work status, defined as working (paid or unpaid) for at least an hour in one's own business, for a household member, or for someone else (during the given reference period). We use this information to create a three-wave panel of observations, in August-October 2020 (call 2), November-December 2020 (call 3) and November-December 2021 (call 5).

[10] The full list of statements is reported for the GAD-7 and PHQ-8 in Figures A.1 and A.2 in the Appendix, respectively.
[11] First, we asked participants whether they were alone in the room and if not, whether they could find a quiet space and/or make sure their phone speaker was off. Second, for each item, we first asked whether the symptom had been observed (Yes/No) over the past 14 days, and if 'Yes' we then asked about the frequency. The adapted questions were piloted prior to the data collection. The scales were administered as the last section of the survey.
[12] Given the unprecedented nature and, therefore, salience of the events taking place at the time, we would expect any recall error in the binary variable of work status before the pandemic to be negligible.

To examine the effect of job loss during the fourth wave of the COVID-19 pandemic on mental health, we restrict the sample to those whose primary activity before the outbreak was working, and who maintained employment throughout 2020, here defined as those who were: i) working before the pandemic (based on the definition above and as captured by the retrospective questions asked in call 2), ii) not enrolled in full-time education at any point during 2020, and iii) working in both call 2 (August-October 2020) and call 3 (November-December 2020).[13] This restriction reduces our sample size as only 1,758 participants were working before the pandemic, 1,473 individuals were not enrolled in full-time education in 2020, and 1,287 individuals were working in both calls 2 and 3. With all restrictions applied, our final sample size is 962 individuals.

Table 1 reports descriptive statistics from our analytical sample. We find that 16.5% of previously-employed respondents lost their jobs during 2021, but that those who lost their job and those who maintained work are well balanced by 2020 anxiety scores and the 2016 Cantril self-anchoring scale.[14] We also find that the groups are well balanced according to changes in 2020 depression scores, although the job loss group had slightly higher levels of symptoms consistent with at least mild depression in November-December 2020. The balance between the two groups is not surprising since reported levels of anxiety and depression among Young Lives respondents in Vietnam during the first year of the pandemic had been relatively low. A recent paper by Porter et al. (2022) using the Young Lives phone survey data (calls 1-3) found that 9.2 (9.4)% of young people aged 18-26 in Vietnam were exhibiting symptoms of at least mild anxiety (depression) in August-October 2020, and that this decreased to 4.8 (6.4)% in November-December 2020 (before the devastating fourth COVID-19 wave in 2021).

[13] The restriction of the sample to those who maintained employment throughout 2020 was to ensure that the pre-2021 mental health outcomes were not already affected by job loss during the first year of the pandemic. 222 individuals who were working full-time before the pandemic lost their jobs before the second phone survey (August-October 2020); however, given that mental health symptoms were collected among Young Lives respondents for the first time in call 2, it is possible that these individuals' (baseline) mental health would already be affected by job loss. Indeed, we find that individuals who lost their job in 2020 were significantly more likely (at the 1% level) to be displaying symptoms consistent with at least mild anxiety and depression in call 2. Therefore, to isolate the effect of job loss during 2021, we exclude those who lost their jobs in 2020.

[14] The Cantril (1965) self-anchoring scale (also known as Cantril's Ladder) asks individuals to visualize a ladder of nine steps, with the bottom step representing the worst life for them and the top step representing their best possible life. Respondents are then asked to identify which step they presently stand on. Porter et al. (2022) show that changes in the Cantril self-anchoring scale are highly correlated with anxiety symptoms according to the GAD-7.

The two samples are also balanced on all household wealth indicators and the prevalence of other economic shocks in 2021 (new health expenses, inflation, household illnesses, natural disasters, and output price declines). However, those who lost work in 2021 are, on average, younger, more likely to be female, have completed fewer years of education, less likely to have had health insurance, and earn significantly less in August-October 2020.[15] Previous research using the Young Lives data finds that women, younger participants, and relatively poorer individuals had significantly higher rates of mental health conditions in 2020, both in terms of anxiety and depression symptoms (Porter et al., 2021). This further suggests that a naïve cross-sectional analysis of the effect of job loss on mental health may be biased.

We also find that individuals who lost their work are less likely to still be living in their natal households (captured by whether participants are living with their parents, aunt, or uncle). We use this information as a proxy for whether participants are likely to be primary earners in their households, under the assumption that individuals who live with their parents, aunt, or uncle are less likely to represent a vital source of income for the household.[16]

TABLE 1. Descriptive statistics

	Maintained work in 2021 (mean)	**Lost work in 2021** (mean)
Individual characteristics		
Age (in years)	22.84	21.60***
Older Cohort	0.60	0.41***
Female	0.42	0.56***
Completed years of education	10.91	10.17***
Self-employed (Nov-Dec 2020)	0.20	0.17
Health insurance (Aug-Oct 2020)	0.42	0.35*
Monthly earnings, 1,000 VND (Aug-Oct 2020)	6,539.77	5,410.69***
At least mild anxiety (Nov-Dec 2020)	0.05	0.07
Change in GAD-7 raw score (Aug-Oct to Nov-Dec 2020)	-0.44	-0.53
Change in proportion with at least mild anxiety (Aug-Oct to Nov-Dec 2020)	-0.03	-0.03
Cantril self-anchoring scale (2016)	5.66	5.56
At least mild depression (Nov-Dec 2020)	0.05	0.08*
Change in PHQ-8 raw score (Aug-Oct to Nov-Dec 2020)	-0.28	-0.31
Change in proportion with at least mild depression (Aug-Oct to Nov-Dec 2020)	-0.02	-0.01
Household characteristics		

[15] This is in line with international evidence that vulnerable groups have been disproportionately affected by pandemic-related job losses (e.g., Adams-Prassl et al., 2020; Dang and Nguyen, 2021; Levya and Urrutia, 2022).
[16] As expected, we find that those who no longer live in their natal household have higher average monthly earnings (7,3 million VND compared to 5,8 million VND), and are more likely to come from the Older Cohort (62% compared to 53%).

Wealth index tercile 1 (poorest, 2016)	0.42	0.47
Wealth index tercile 2 (2016)	0.37	0.31
Wealth index tercile 3 (2016)	0.22	0.22
At least struggling (Aug-Oct 2020)	0.08	0.09
Worried about running out of food in past year (Nov-Dec 2020)	0.16	0.19
At least comfortable (Aug-Oct 2020)	0.92	0.91
Urban household (Nov-Dec 2020)	0.33	0.46***
No longer lives in natal household (Nov-Dec 2020)	0.35	0.42*
Household size (Aug-Oct 2020)	3.92	3.73
New health expenses in 2021	0.24	0.27
Rise in food prices in 2021	0.37	0.33
Illness of income earner in 2021	0.03	0.04
Natural disaster in 2021	0.03	0.03
Fall in output prices in 2021	0.16	0.18
Number of individuals	803	159
Sample proportion (%)	83.5	16.5

Notes: Wealth terciles are based on the Young Lives Round 5 (2016) wealth index (Briones, 2017). The variables 'At least struggling' and 'At least comfortable' are derived from a subjective measure of household wealth based on a Likert scale, whereby a response of 1 represents 'destitute' and a response of 6 represents 'very rich'. 'At least struggling' takes the value of one if a participant answers 'destitute, 'poor' or 'struggling', while 'At least comfortable' takes the value of one if a participant answers 'comfortable', 'rich' or 'very rich'. Cantril (1965) self-anchoring scale asks the young people to visualize a ladder of nine steps, with the bottom step representing the worst life for them and the top step representing their best possible life. Respondents were asked to identify which step they presently stood on. The variable 'No longer lives in natal household' takes the value of one if there is no parent (biological, stepparent, or in-law) or aunt/uncle present in the household. Results of t-tests of the equality of means between those who maintained work in 2021 and those who lost their job in 2021 are reported. * denotes significance at 10%, ** significance at 5% and *** significance at 1%

5. Empirical strategy

Our empirical strategy is based on an individual and survey call fixed-effects model (equation 1):

$$Mental\ health_{it} = \alpha_i + \varphi_t + \beta Lost\ Job_{it} + \boldsymbol{\rho X_h} + \varepsilon_{iht.} \quad (1)$$

Our outcome variable, *Mental health,* represents the anxiety or depression outcome for individual *i* in time *t*. As all respondents were employed pre-pandemic and throughout 2020, our independent variable of interest, *Lost Job,* equals zero for all observations in calls 2 and 3. However, in call 5, *Lost Job* takes the value of one if the participant no longer reported working in November-December 2021 (and zero otherwise). α_i is an individual fixed effect, intended to capture any fixed or prior characteristics of the individual or environment which influence the probability of losing work and/or mental health (as discussed in the previous section). φ_t represents survey-call fixed effects, and $\boldsymbol{X}$ is a vector of time-varying household-level controls, including urban/rural location, household size, and experience of other economic shocks (new health expenses, rise in food prices, fall in output prices, natural disaster, and illness of income

earner in the household).[17] The parameter of interest is β, which captures the effect of losing one's job on anxiety or depression.

The fixed effects regression framework is easily extended to identify heterogeneous effects, and quantify whether individuals with certain characteristics are more or less vulnerable to the effects of losing their job:

$$Mental\ health_{it} = \alpha_i + \varphi_t + \beta Lost\ Job_{it} + \delta W_{ih} + \gamma(Lost\ Job_{it} * W_{ih}) + \boldsymbol{\rho X_h} + \varepsilon_{iht.} \quad (2)$$

W represents a participant's individual or household characteristic of interest. In particular, we analyse whether the effects of job loss on anxiety differ according to age (proxied by a Cohort dummy variable), call 2 earnings (terciles)[18], and whether the participant still lives in their natal household (as a proxy for whether they are likely to be a primary earner in the household).

6. Results

6.1 Main results

Table 2 shows the average effects of job loss on anxiety and depression. We find that losing work during the pandemic significantly increases young people's symptoms of anxiety, but not depression. More specifically, job loss increases the probability of experiencing symptoms of at least mild anxiety by nearly 6 percentage points (ppts) (a 0.27 standard deviation (*SD*) increase). This represents a 115% increase relative to the average prevalence among the sample in November-December 2020. The fact that anxiety is affected by job loss, but not depression, is not particularly surprising, as existing evidence suggests that there is typically a sequential relationship between the emotions such that depression comes after anxiety (Boland and Keller, 2009; Fava et al., 2000; Kessler et al., 1996).

[17] Not all time-varying controls are observed in every call. We assume that household size remained constant between calls 2 and 3, and that the prevalence of economic shocks is the same in calls 2 as in call 3. Given the short time period between these calls, and the low prevalence of COVID-19 at the time, we do not feel that these are unrealistic assumptions. It may be argued that new health expenses and illness of an income earner are a consequence of COVID-19, which may contribute to job loss (if, for example, everyone in the household has COVID-19 and cannot return to work). We find that our results are robust to the exclusion of these controls.

[18] We use call 2 earnings, rather than call 3, as we can compute comparable monthly earnings for all participants using call 2 data. In call 3, we did not ask respondents about the frequency of their work, and so we are not able to compute monthly earnings for individuals who did not report their usual payment period as monthly.

TABLE 2. The effect of job loss on anxiety

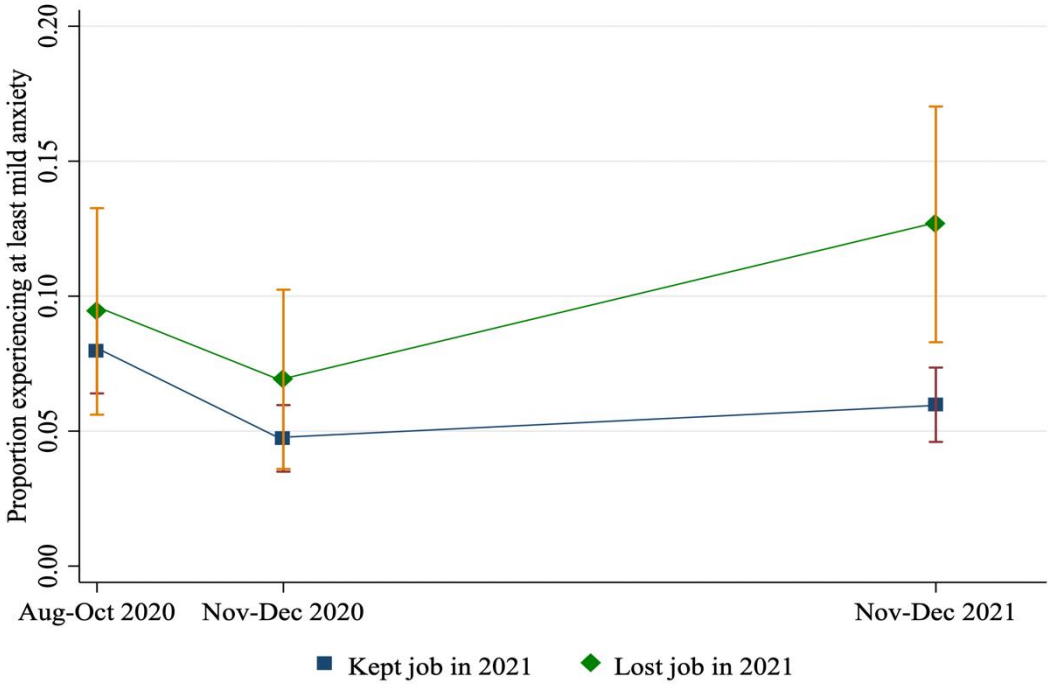
	Anxiety		**Depression**	
	GAD-7 score	*At least mild anxiety*	*PHQ-8 score*	*At least mild depression*
Lost work in 2021	0.581**	0.059**	0.287	0.013
	(0.235)	(0.028)	(0.231)	(0.028)
Controls	Yes	Yes	Yes	Yes
Observations	2,871	2,871	2,869	2,869

Note: All specifications control for household location (urban/rural), household size, whether the household experienced new health expenses, inflation, natural disasters, illness and a fall in output prices, and individual and survey call fixed effects. Robust standard errors are reported in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Figure 2 shows the changes over time in the proportion of individuals who report symptoms consistent with at least mild anxiety. An inspection of the changes in symptoms of anxiety in 2020 suggests that the trends appear parallel prior to the fourth COVID-19 wave. However, individuals who lost their jobs during the fourth wave in 2021 experienced significantly larger increases in symptoms of anxiety. Among the group of young people who lost their job in 2021, the proportion with at least mild anxiety rose by 83% between November-December 2020 and November-December 2021 (from 6.9% to 12.7%).[19] In contrast, there was no significant change in the proportion of individuals with at least mild anxiety among those who maintained work in 2021.

[19] The difference between the proportion in November-December 2020 and November-December 2021 is statistically significant at the 10% level.

FIGURE 2. Changes in anxiety over time



Notes: Vertical bars indicate a 90% confidence interval around the mean.

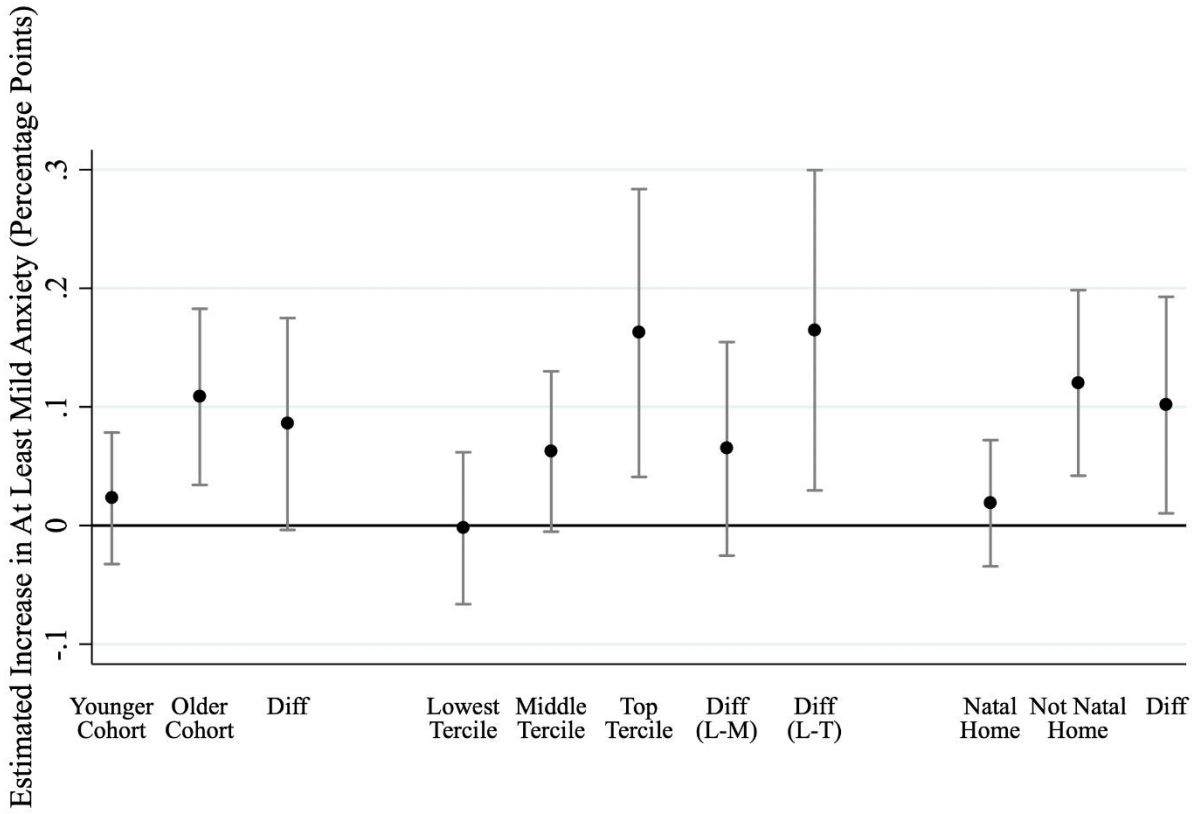
6.2 Heterogeneous effects of job loss on anxiety

Having established that job loss during the fourth COVID-19 wave in Vietnam significantly increases young people's symptoms of anxiety, we next move on to identifying possible heterogeneous effects.[20] Figure 3 reports the heterogeneous effects of job loss on symptoms of anxiety according to young people's age (i.e., comparing the Younger and the Older Cohort), call 2 monthly earnings terciles, and whether the participant still lives in their natal household.[21]

FIGURE 3. Predicted increase in at least mild anxiety by sub-groups

[20] Given that we do not find any significant average effects of job loss on symptoms of depression, we only focus on anxiety in this section.

[21] We also interacted the job loss indicator with gender and found no significant differences. Full regression results are in Table A.2 in the Appendix.



Notes: Predictions for each group are calculated using equation (2). (L-M) and (L-T) refer to the difference between the Lowest Tercile and the Middle Tercile, and the Lowest Tercile and the Top Tercile, respectively. All specifications control for household location (urban/rural), size, whether the household experienced new health expenses, inflation, natural disasters, illness and a fall in output prices, and individual and survey call fixed effects. Vertical bars indicate a 90% confidence interval around predictions.

When considering the effect of age, only an increase in anxiety for the Older Cohort (predicted at 10.9 ppts, a 0.59 *SD* increase) is significantly different from zero, although there is no significant difference between this prediction and the prediction for the Younger Cohort (2.3 ppts). We also find that the increase in anxiety due to job loss is only significantly different from zero among the top earnings tercile (predicted at 16.2 ppts, a 0.73 *SD* increase), and that there is a significant difference between the top and bottom earnings tercile (but not the middle tercile). Lastly, we find that the increase in anxiety is only significant among those no longer living in their natal household (estimated at 12.0 ppts, a 0.49 *SD* increase), but not among those still living with their parents. This finding is in line with Alam and Bose (2022), who conclude that job loss among young adults in the U.S. during the Great Depression only led to a deterioration of mental health when they were living independently, but not when they were still living with their parents.

When trying to understand the earnings results, we find evidence that, at least in part, the differences according to wealth are linked to differences in household composition. Nearly three-quarters of young adults in the lowest earnings tercile still live in their natal households, while only roughly half of the respondents in the top earnings tercile still live in their natal household.[22] This is in line with existing literature which finds that migration rates out of the household in Vietnam are typically higher for well-educated individuals from higher-income households than the poor, who may lack the means to move (Coxhead et al., 2015; Nguyen et al., 2017).

Splitting the top earnings tercile sample by whether participants still live in their natal households, and estimating equation (1) separately, suggests that the result among the top tercile appears to be driven entirely by individuals who are no longer in their natal households; in the sample who still live in their natal households, the coefficient on job loss is no longer statistically significant (regression results in Table A2 in the annex).[23]

7. Robustness

7.1 General effects of COVID-19 on mental health

The results presented above suggest an economically large increase in anxiety due to job loss during the pandemic. However, there are many channels through which the pandemic may affect mental health. Previous research indicates that individuals who have been infected with COVID-19, or just believe that they are at higher risk of catching the virus, are more likely to experience mental health conditions such as anxiety and depression (Mazza et al., 2020; Porter et al., 2022). This implies that, if job losses during the fourth wave in 2021 were correlated with a higher prevalence of COVID-19 cases (which may well be the case given that more stringent economic restrictions were enforced in areas with higher cases), the results in Section 6 may conflate other channels through which COVID-19 affects anxiety, rather than the effect of job losses per se.

[22] The difference in proportions between the bottom and top earnings terciles is significant at the 1% level.

[23] We interpret these results with the caveat that only a small number of individuals lost their job in the highest earnings tercile (50 respondents, in total - which corresponds to 15% of the highest earnings tercile sample). Given that the inclusion of the individual fixed effect implies the coefficient of interest is only defined by those who lose employment in 2021, estimating the model separately for those in the highest tercile who i) lived in the natal household, and ii) did not live in the natal household, leaves only 22 and 28 individuals, respectively, who define the value of β in model (1).

Ideally, to account for this, we would control for daily (confirmed) COVID-19 cases at the district level. However, there is no publicly available data in Vietnam that allows us to track COVID-19 cases by district over time. We therefore, include Google Trends information in each district, controlling for the prevalence of searches on the topic 'COVID-19 testing'.[24] The assumption is that the number of Google searches on the topic 'COVID-19 testing' increases with the number of COVID cases, and this seems to be the case: at the national level, Google search information on 'COVID-19 testing' is significantly correlated with daily confirmed COVID-19 cases (Pearson's correlation of 0.684, significant at the 1% level). We match the date of the survey interview for Young Lives participants to the nearest date (within a week) for which Google Trends information is available in the district where the Young Lives respondent lives. We find that our results are robust to including a variable capturing this information (the results can be found in Tables B.1-B.2 in the Appendix), which suggests that an increase in COVID-19 cases locally does not explain the increase in anxiety observed.

Along the same line, as an additional check, we also re-estimate our main specifications controlling for participants' perceived COVID-19 infection risk. This is based on a Likert scale approach, whereby a response of 0 represents 'no risk' of being infected and a response of 6 represents 'high risk'.[25] Overall, we conclude that the interpretation of our main findings is robust to including perceived risk of infection (full results can be found in Tables B.3-B.4 of the Appendix).

7.2 Comparison to nationally representative estimates

As discussed in Section 4, by design, the Young Lives dataset was not intended to be nationally representative. Households in the Young Lives sample are, on average, poorer than households in nationally representative samples (Nguyen, 2008). Furthermore, attrition between the first survey in 2002 and the third COVID-19 phone survey means that females and those in rural areas are overrepresented in the phone survey sample. Ideally, we would like our results to be representative of individuals in Vietnam who are aged 18-19 or 26-27 and who are in full-time

[24] For each district, Google Trends normalizes data on the number of google searches using the key phrase over time to allow comparison between geographical units of different sizes.
[25] We asked young people about their perceived risk of infection in calls 2 and 5, but not call 3. For this analysis, we assume that the perceived COVID-19 infection risk is not materially different between call 2 (August-October 2020) and call 3 (November-December 2020). Given the very low prevalence of COVID-19 throughout 2020, we do not feel that this is a stringent assumption.

work (i.e., working and not in full-time education). Table C.1 in the Appendix compares our sample to the appropriate restricted sample from the 2009 Vietnamese Population and Housing Census. The comparison indicates that 18-19-year-olds, urban households, and individuals from the Northern Uplands and Central Coast regions are overrepresented in our analytical sample.

To account for the demographic biases of our sample, we use post-stratification weights for age, gender, location (urban/rural) and region to re-weight the sample such that we match the nationally representative sample from the Population and Housing Census. We do this via an iterative proportional fitting (raking) process, whereby an iterative weighting process is repeated until the differences between the sample margins and the known population margins are smaller than a specified tolerance value (Fienberg et al., 1970).[26] Re-estimating the main results from Section 6, we find that using post-stratification weights does little to alter their interpretation (results in Tables C.2-C.3 in the Appendix).

8. Decomposition of channels underlying the increase in anxiety

A variety of hypotheses have been offered to explain why job loss may lead to a deterioration in mental health (Price et al., 2002). On the one hand, there is evidence which suggests that the financial strain caused by job loss - as well as its consequences in the form of subsequent stressors such as insufficient food, shelter, and inability to pay bills - is the critical mediator in the relationship between unemployment and poor mental health (Kessler et al., 1987; Vinokur and Schul, 1997; Jones, 2017). Our finding in Section 6 that the increase in anxiety is significantly larger among young adults who no longer live in their natal households suggests that financial strain may indeed be an important mediator in our sample. Many of these non-natal households may be particularly vulnerable to economic shocks, as they may be newly formed and yet to accumulate substantial savings. Indeed, we find that just over 60% of non-natal households have been formed since 2016.

However, other research (such as Jahoda, 1979, and Warr, 1987) argues that job loss produces profound non-pecuniary changes in the life of working individuals, such as loss of structured time, valued relationships, perceived identity, and purpose – which also has important detrimental effects on an individual's mental health. This could offer another explanation as to

[26] This was done using the *ipfweight* Stata package (Bergmann, 2011). We used an accepted tolerance of 0.05.

why the observed increase in anxiety is largest among individuals in the top earnings tercile, who often report higher levels of job satisfaction (Anh et al., 2019) and are more attached to identities that are indicative of their socio-economic status, such as occupation (Easterbrook et al., 2020).

Building on the regression results in Section 6, we use additional regressions to characterise the extent to which the increases in anxiety are due to changes in perceived household wealth and food insecurity. Given the results in Table 2, these regressions allow us to investigate how much of the job-loss-induced increases in anxiety can be explained by changes in food insecurity and household wealth, and how much is unexplained by these pecuniary factors.

To get at the mediation role of financial strain and food insecurity, we employ the following specification:

$$Anxiety_{it} = \alpha_i + \varphi_t + \tilde{\beta} Lost\ Job_{it} + \boldsymbol{\rho X_h} + \tau Struggling_h + \gamma Food\ insecurity_h + \varepsilon_{iht.} \quad (3)$$

Struggling is a subjective measure of household wealth, based on a Likert scale approach, whereby a response of 1 represents 'destitute' and a response of 6 represents 'very rich'. From this information, we generated a binary variable which takes the value of one if the participant describes her/his household as 'destitute', poor' or 'struggling', and zero otherwise.[27] In August-October 2020, 8.6% of the sample described their household as at least struggling. *Food insecurity* is a measure of (at least) mild food insecurity, which takes the value of one if, in the past year, the participant worried that their household would run out of food before they could get money to buy or could acquire more (and zero otherwise). In November-December 2020, 16.8% of the sample reported having worried that their household would run out of food in the past year. $\tilde{\beta}$ is a measure of the effect of job loss on anxiety, purged of any effects operating through changes in household wealth and food insecurity. To gauge the importance of the potential channels in explaining the total change in anxiety due to job loss, we compare the total effect (β in equation (1)) with the corresponding $\tilde{\beta}$ in equation (3). The difference

[27] We asked young people about the wealth ranking of their household in calls 2 and 5, but not call 3. For this analysis, we assume that the wealth of the household is not materially different between call 2 (August-October 2020) and call 3 (November-December 2020). Given that all participants were continuously employed over the short period between the two calls, and the low prevalence of COVID-19 at the time, we do not feel that this is an unrealistic assumption.

between the two measures ($\beta - \tilde{\beta}$) provides an estimate of the effect attributable to the two pecuniary mediators.

We present our estimates of equation (3) in Table 3. In line with existing literature, we find that changes in food insecurity and household wealth significantly predict changes in anxiety, as the coefficients on *Struggling* and *Food insecurity* are consistently positive and statistically significant.[28] Comparing the estimated coefficients of *Lost Job* in Table 3 ($\tilde{\beta}$) to those in Table 2 (β), we find that controlling for changes in food insecurity and household wealth reduces the effect of job loss on anxiety by 22.2% (GAD-7 score) and 18.6% (at least mild anxiety indicator). [29] However, the coefficient of interest remains statistically significant (at the 10% level) and economically meaningful. This suggests that, although financial strain may account for a non-trivial proportion of the increase in anxiety due to job loss, the majority of the increase in anxiety due to job loss remains unaccounted for. This is consistent with the fact that we find the strongest effect of job loss among those in the top earnings tercile.

TABLE 3. The effect of job loss on anxiety controlling for changes in household wealth and food insecurity

	GAD-7 score	**At least mild anxiety**
Lost work in 2021	0.452*	0.048*
	(0.233)	(0.028)
Mild food insecurity	0.375**	0.038*
	(0.168)	(0.022)
Struggling	1.152***	0.083**
	(0.304)	(0.033)
Controls	Yes	Yes
Observations	2,869	2,869

Note: All specifications control for household location (urban/rural), size, whether the household experienced new health expenses, inflation, natural disasters, illness and a fall in output prices, and individual and survey call fixed effects. Robust standard errors are reported in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

9. Conclusion

[28] As expected, we also find that job loss during 2021 significantly predicts decreases in perceived household wealth and increases in mild food insecurity. Regression results are presented in Appendix D.

[29] We also included an interaction term between *Struggling* and *Food insecurity*, and found that this does very little to alter the interpretation of the results.

Despite recurrent calls for investment into research and policies that target young adults during this critical stage of their lives (Bonnie et al., 2015; Stroud et al., 2015; Walker-Harding et al., 2017), there is a dearth of evidence on the consequences of job loss on the mental health of this group. In this paper, we analyse the effect of job loss during the fourth COVID-19 wave in Vietnam on levels of anxiety and depression among young adults. Our results indicate that experiencing job loss significantly increases the levels of anxiety, but not depression. Specifically, we find that employment loss during the fourth COVID-19 wave led to a 5.9 percentage point increase in the probability of experiencing symptoms consistent with either mild or severe anxiety (a 0.27 standard deviation increase). This effect is driven by individuals in the top earnings tercile who no longer live in their natal household - suggesting that the impact of job loss on anxiety is most acute among individuals who are likely primary earners in their household.

We also present evidence that a considerable proportion (up to 22%) of the effect of job loss on anxiety may be operating through changes in perceived household wealth and food insecurity. However, the existence of a large increase in anxiety levels, which cannot be attributed to either of these factors, suggests that there are channels beyond immediate financial strain that likely have a sizeable role in explaining the detrimental effects of job loss on anxiety. Aside from financial strain, the literature suggests that loss of employment may engender profound non-pecuniary changes in the lives of working individuals - such as loss of structured time, valued relationships, and perceived identity - which may have important detrimental effects on their mental health (Jahoda, 1979; Warr, 1987). Similarly, job loss may lead to a sense of loss of personal control over life outcomes, which may have adverse impacts on mental health (Price et al., 2002). Measures of such non-pecuniary considerations were not captured in the Young Lives phone surveys, which precludes us from including them in our formal regression analysis.

While the results presented here are, by definition, short-term, they may have important implications for public policy measures aimed at reducing mental health problems, which have high direct and indirect costs (Collins et al., 2011). This may be particularly true if the detrimental effects of job loss on anxiety persist and leave enduring scars that can be traced for many years, even after re-employment. These long-term scarring effects have been well-documented among individuals in high-income countries, particularly among young workers (e.g., Eberl et al., 2022; Clark et al., 2001; Lucas et al., 2004; Mousteri et al., 2018; Strandh et

al., 2014). The fact that a large portion of the effect of job loss on anxiety is not explained by measured financial strain implies that policymakers are unlikely to fully remediate the effects with cash/food transfer programmes. Providing mental health and psychosocial support for young people is therefore of critical importance, in addition to active policies aimed at helping young people re-enter the labour market and sustain employment.

In January 2022, the Prime Minister of Vietnam approved the 2022-25 National Plan for prevention and control of non-communicable diseases and mental health disorders. Among other things, the programme requires improving policies on the prevention and treatment of mental disorders in the country. Following the government's decision, in June 2022, the Ministry of Education and Training (MOET) promulgated a programme on mental health education to be taught in the MOET system, with the goal of improving mental health communication and education for administrators, staff, and students. Our results support expanding the programme to explicitly target young adults who are no longer in education. For example, introducing mental health training and counselling initiatives in the workplace may help young adults stay self-confident and motivated when they re-enter the labour market. Integrating mental health into existing services, such as primary health care, social services, and community-based services to train health professionals in basic counselling could also help deliver vital services to young adults - including those unemployed - in resource-constrained settings.

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Appendix

Appendix A

TABLE A.1. Young Lives sample attrition

	2016 Attrition		Phone survey attrition	
	Surveyed in 2016 (mean)	*Attrited (since 2002)* (mean)	*Participated in third phone survey* (mean)	*Attrited (since 2016)* (mean)
Female	0.50	0.40**	0.51	0.39***
Younger cohort	0.68	0.41***	0.68	0.71
Urban household	0.19	0.37***	0.27	0.36***
Bottom Wealth Tercile (2002)	0.33	0.34		
Middle Wealth Tercile (2002)	0.34	0.21***		
Top Wealth Tercile (2002)	0.32	0.45***		
Bottom Wealth Tercile (2016)			0.34	0.38
Middle Wealth Tercile (2016)			0.34	0.27***
Top Wealth Tercile (2016)			0.32	0.36*
Individuals	2,848	152	2,496	370
Total sample attrition %		5.1%		12.3%

FIGURE A.1. GAD-7 questionnaire in the Young Lives survey

SAY: I am going to read you some questions and I want you to tell me whether these situations have occurred to you or not in t weeks. If this has happened to you, I will also ask you how often this happened

			Q.4 How often the situation occurred in the last two weeks?
Q.3-Q.4	**FIELDWORKER:** read the table line by line. **Q.3. SAY:** In the last two weeks, have you been…? 00=No, not at all 01=Yes, even if a little bit **CAPI:** Enable Q.4, for those items where Q.3 =01. If the answer is 00=No, move to the next line **ENUMERATOR:** please make sure that the [YL Child] understand that No means never not even for a moment or a day in the past two week.		01= Less than half the days 02=More than half the days 03=Nearly everyday 77=NK 79=RTA 88=NA
01	Feeling nervous, anxious or on edge	O No, not at all O Yes, even if a little bit	[__]
02	Not being able to stop or control worrying	O No, not at all O Yes, even if a little bit	[__]
03	Worrying too much about different things	O No, not at all O Yes, even if a little bit	[__]
04	Trouble relaxing/ Can't relax	O No, not at all O Yes, even if a little bit	[__]
05	Being so restless that it's hard to sit still	O No, not at all O Yes, even if a little bit	[__]
06	Becoming easily annoyed or irritable	O No, not at all O Yes, even if a little bit	[__]
07	Feeling afraid as if something awful might happen	O No, not at all O Yes, even if a little bit	[__]

FIGURE A.2. PHQ-8 questionnaire in the Young Lives survey

PHQ-8
Say: I am going to read you some questions and I want you to tell me whether these situations have ocurred to you or not. If t happened to you, I also want to know how often have occurred in the last two weeks

			Q.6 How often the situation occurred in the last two weeks?
Q.5-Q.6	**FIELDWORKER:** read the table line by line. **Q.5. SAY:** In the last two weeks, have you been bothered by any of the following problems…? 00=No, not at all 01=Yes, even if a little bit **CAPI:** Enable Q.6, for those items where Q.5 is 01=Yes. If the answer is 00=No, move to the next line **ENUMERATOR**: please make sure that the [YL Child] understand that No means never not even for a moment or a day in the past two week.		01= Less than half the days 02=More than half the days 03=Nearly everyday 77=NK 79=RTA 88=NA
01	Little interest or pleasure in doing things	O No, not at all O Yes, even if a little bit	[__]
02	Feeling down, depressed or hopeless	O No, not at all O Yes, even if a little bit	[__]
03	Trouble falling or staying asleep, or sleeping too much	O No, not at all O Yes, even if a little bit	[__]
04	Feeling tired or having little energy	O No, not at all O Yes, even if a little bit	[__]
05	Poor appetite or overeating	O No, not at all O Yes, even if a little bit	[__]
06	Feeling bad about yourself - or that you are a failure or have let yourself or your family down	O No, not at all O Yes, even if a little bit	[__]
07	Trouble concentrating on things, such as reading the newspaper or watching television	O No, not at all O Yes, even if a little bit	[__]
08	Moving or speaking so slowly that other people could have noticed. Or the opposite - being so fidgety or restless that you have been moving around a lot more than usual.	O No, not at all O Yes, even if a little bit	[__]

TABLE A.1. Heterogenous effects of job loss on anxiety

	Gender	**Cohort**	**Earnings terciles**	**Presence of adult**
Lost work	0.080*	0.023	-0.002	0.019
	(0.043)	(0.034)	(0.039)	(0.032)
Lost work * Female	-0.038			
	(0.054)			
Lost work * Older cohort		0.086		
		(0.054)		
Lost work * Middle tercile			0.065	
			(0.055)	
Lost work * Top tercile			0.165**	
			(0.082)	
Lost work * Not in Natal Household				0.101*
				(0.055)
Controls	Yes	Yes	Yes	Yes
Lost work among Females	0.042			
	(0.036)			
Lost work among Older Cohort		0.109**		
		(0.045)		
Lost work among Middle tercile			0.062	
			(0.041)	
Lost work among Top tercile			0.162**	
			(0.073)	
Lost work among Not in Natal Household				0.120**
				(0.048)
Observations	2,871	2,871	2,743	2,871

Note: Dependent variable is a binary indicator for symptoms of at least mild anxiety. All specifications control for household location (urban/rural), size, whether the household experienced new health expenses, inflation, natural disasters, illness and a fall in output prices, and individual and survey call fixed effects. Estimates for non-base categories are calculated as a linear combination of coefficients in the regression analysis. Robust standard errors are reported in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

TABLE A.2. Effect of job loss on anxiety according to whether respondents are still in natal household, top earnings tercile only

	In Natal Household	**Not in Natal Household**
Lost work in 2021	0.070	0.168**
	(0.108)	(0.083)
Controls	Yes	Yes
Observations	450	457

Note: Dependent variable is a binary indicator for symptoms of at least mild anxiety. The sample is constrained to the highest call 2 earnings tercile only. All specifications control for household location (urban/rural), size, whether the household experienced new health expenses, inflation, natural disasters, illness and a fall in output prices, and individual and survey call fixed effects. Robust standard errors are reported in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Appendix B

TABLE B.1. The effect of job loss on anxiety, controlling for Google Trends information

	Anxiety		**Depression**	
	GAD-7 score	*At least mild anxiety*	*PHQ-8 score*	*At least mild depression*
Lost work in 2021	0.691***	0.073**	0.410	0.021
	(0.261)	(0.032)	(0.258)	(0.031)
COVID-19 testing	0.014***	0.001**	0.015***	0.002**
searches	(0.005)	(0.001)	(0.006)	(0.001)
Controls	Yes	Yes	Yes	Yes
Observations	2,698	2,698	2,696	2,696

Note: All specifications control for household location (urban/rural), size, whether the household experienced new health expenses, inflation, natural disasters, illness and a fall in output prices, and individual and survey call fixed effects. 'COVID-19 testing searches' refers to the prevalence of Google searches on the topic 'COVID-19 testing'. Robust standard errors are reported in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

TABLE B.2. Heterogeneous effects of job loss on anxiety by earnings and natal household, controlling for Google Trends information

	Earnings terciles	**Natal household**
Lost work	-0.004	0.034
	(0.042)	(0.034)
Lost work * Middle earnings	0.100	
tercile	(0.066)	
Lost work * Top earnings tercile	0.212**	
	(0.085)	
Lost work * Not in Natal		0.108*
Household		(0.065)
COVID-19 testing searches	0.001*	0.001**
	(0.001)	(0.001)
Controls	Yes	Yes
Observations	2,572	2,698

Note: All specifications control for household location (urban/rural), size, whether the household experienced new health expenses, inflation, natural disasters, illness and a fall in output prices, and individual and survey call fixed effects. 'COVID-19 testing searches' refers to the prevalence of Google searches on the topic 'COVID-19 testing'. Robust standard errors are reported in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

TABLE B.3. The effect of job loss on anxiety, controlling for perceived risk of COVID-19 infection

	GAD-7 score	**At least mild anxiety**
Lost work in 2021	0.583**	0.058**
	(0.236)	(0.028)
Low risk	0.223	-0.017
	(0.152)	(0.020)
Medium risk	0.437**	0.014
	(0.177)	(0.022)
High risk	0.272	0.014
	(0.211)	(0.031)
Controls	Yes	Yes
Observations	2,867	2,867

Note: All specifications control for household location (urban/rural), size, whether the household experienced new health expenses, inflation, natural disasters, illness and a fall in output prices, and individual and survey call fixed effects. Baseline category for risk of COVID-19 infection is 'No risk'. Robust standard errors are reported in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

TABLE B.4. Heterogeneous effects of job loss on anxiety by earnings and natal household, controlling for perceived risk of COVID-19 infection

	At least mild anxiety	**At least mild anxiety**
Lost work	-0.005	0.019
	(0.039)	(0.0342)
Lost work * Middle earnings	0.066	
tercile	(0.055)	
Lost work * Top earnings tercile	0.172**	
	(0.082)	
Lost work * Not in Natal		0.099*
Household		(0.055)
Low risk	-0.014	-0.017
	(0.020)	(0.020)
Medium risk	0.017	0.012
	(0.023)	(0.022)
High risk	0.016	0.014
	(0.031)	(0.031)
Controls	Yes	Yes
Observations	2,739	2,867

Note: All specifications control for household location (urban/rural), size, whether the household experienced new health expenses, inflation, natural disasters, illness and a fall in output prices, and individual and survey call fixed effects. Baseline category for risk of COVID-19 infection is 'no risk'. Robust standard errors are reported in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Appendix C

TABLE C.1. Comparison of analytical sample characteristics with census data

	Sample (mean)	*Census* (mean)
Female	46.2	47.7
Younger cohort	45.7	39.9
Urban household	36.7	25.1
Northern uplands	18.6	14.8
Red river delta	14.4	21.2
Mekong delta	15.1	20.0
Central coast	25.5	21.2
Other region	26.5	22.8
Individuals	1,266	781,183

Notes: Population statistics based on Vietnam 2009 Population and Housing Census. Sample used for census comparison is individuals aged 18, 19, 26 and 27 who are working and not enrolled in education. Individuals aged 18-19 are referred to as 'Younger cohort'. Population weights calculated by the General Statistics Office of Vietnam (GSO).

TABLE C.2. Effect of job loss on anxiety, weighted regressions

	Anxiety		**Depression**	
	GAD-7 score	*At least mild anxiety*	*PHQ-8 score*	*At least mild depression*
Lost work in 2021	0.587**	0.058*	0.402	0.035
	(0.233)	(0.031)	(0.244)	(0.029)
Controls	Yes	Yes	Yes	Yes
Observations	2,871	2,871	2,869	2,869

Note: Results are weighted using post-stratification weights derived from the Vietnam 2009 Population and Housing Census. Sample used for census comparison is individuals aged 18, 19, 26 and 27 who are working and not enrolled in education. Weights calculated using *ipfweight* Stata package. All specifications control for household location (urban/rural), size, whether the household experienced new health expenses, inflation, natural disasters, illness and a fall in output prices, and individual and survey call fixed effects. Robust standard errors are reported in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

TABLE C.3. Heterogeneous effects of job loss on anxiety, weighted regressions

	Gender	**Cohort**	**Earnings terciles**	**Natal Household**
Lost work	0.102**	0.030	0.001	0.031
	(0.046)	(0.035)	(0.045)	(0.035)
Lost work * Female	-0.075			
	(0.059)			
Lost work * Older cohort		0.061		
		(0.060)		
Lost work * Middle tercile			0.062	
			(0.062)	
Lost work * Top tercile			0.178**	
			(0.088)	
Lost work * Not in Natal Household				0.078
				(0.072)
Controls	Yes	Yes	Yes	Yes
Lost work among Females	0.027			
	(0.039)			
Lost work among Older Cohort		0.091*		
		(0.050)		
Lost work among Middle tercile			0.062	
			(0.045)	
Lost work among Top tercile			0.179**	
			(0.077)	
Lost work among Not in Natal Household				0.109**
				(0.055)
Observations	2,871	2,871	2,743	2,871

Note: Dependent variable is a binary indicator for symptoms of at least mild anxiety. Results are weighted using post-stratification weights derived from the Vietnam 2009 Population and Housing Census. Sample used for census comparison is individuals aged 18, 19, 26 and 27 who are working and not enrolled in education. Weights calculated using *ipfweight* Stata package. All specifications control for household location (urban/rural), size, whether the household experienced new health expenses, inflation, natural disasters, illness and a fall in output prices, and individual and survey call fixed effects. Estimates for non-base categories calculated as a linear combination of coefficients in regression analysis. Robust standard errors are reported in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Appendix D

To analyse the impact of job loss on household wealth and food insecurity, we estimate the following specification:

$$Y_{ht} = \alpha_i + \varphi_t + \beta Lost\ Job_{it} + \boldsymbol{\rho X_h} + \varepsilon_{iht}, \quad \text{(i)}$$

Where Y_{ht} represents the indicators of *Struggling* or *Food insecurity*. Table B1 reports the results.

TABLE D.1. The effect of job loss on subjective household wealth and food insecurity

	At least struggling	**Mild food insecurity**
Lost work in 2021	0.066**	0.137***
	(0.031)	(0.048)
Controls	Yes	Yes
Observations	2,872	2,870

Note: All specifications control for household location (urban/rural), size, whether the household experienced new health expenses, inflation, natural disasters, illness and a fall in output prices, and individual and survey call fixed effects. Robust standard errors are reported in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.