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IZA DP No. 15150

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ABSTRACT

The Effects of Medicaid Expansion on Job Loss Induced Mental Distress during the COVID-19 Pandemic in the US*

The COVID-19 pandemic led to an unprecedented level of job losses in the U.S., where a job loss is also associated with the loss of health insurance. This paper uses data from the 2020 Household Pulse Survey (HPS) and difference-in-difference (DD) regressions to estimate the effect of the Medicaid expansion on anxiety and depression associated with job loss. Estimates show that the respondents who live in expansion states are 96.6% (36.3%) *more* likely to have Medicaid coverage, and correspondingly, 14.2% (7.6%) *less* likely to have moderate to severe mental distress following their job loss (a family member's job loss) compared to those living in non-expansion states. Further explorations suggest that the economic security provided by Medicaid is as important (if not more) as the access or utilization to healthcare. The difference-in-difference-in-difference (DDD) estimates using just above and below the Medicare eligibility age (65) confirm these results.

JEL Classification: I12, I18, J6

Keywords: job loss, depression, anxiety, mental health, COVID-19, Medicaid

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1. Introduction

The COVID-19 pandemic led to unprecedented job destruction and a historic increase in mental distress around the world. Symptoms of anxiety or depression almost quadrupled (from 11% to 42%) between 2019 and 2020 (Abbott, 2021) in the U.S. One reason may be the unprecedented level of job destruction during the pandemic. The number of new weekly unemployment claims peaked at around 6.5 million in the first week of April 2020, and more than 36 million American workers filed for unemployment insurance in just the first eight weeks of the pandemic[2]. The unemployment rate peaked at 14.8% in April 2020 and was at 6.1% in April 2021[3].

Job losses can be traumatic for individuals and families. A recent survey indicates that 70% of unemployed workers report being more stressed than usual, and 56% reported having more mental health issues than usual[4]. Research has shown that job losses not only adversely affect economic and social outcomes (Charles & Stephens Jr., 2004) but also hurt physical and mental health (Winkelmann & Winkelmann, 1998; Cygan-Rehm et al., 2017; Clark et al., 2001; Schaller & Stevens, 2015) and even mortality (Eliason & Storrie 2009; Sullivan and Von Wachter, 2009; Browning & Heinesen, 2012; Bloemen Hochguertel & Zweerink, 2018). In a recent paper, Johnston, Shields, & Suziedelyte (2020) found that even job insecurity has a significant negative impact on the mental health of employees.

In the U.S., a job loss can be particularly stressful because it is also associated with loss of health insurance. In the U.S., most nonelderly adults are covered by Employer-Sponsored Insurance (ESI). Estimates suggest that 7.7 million workers (and 6.9 million dependents) lost ESI in just the first three months of the pandemic (Fronstin & Woodbury, 2020). Loss of health insurance can be stressful at any time, but it can be particularly stressful in the middle of a pandemic.

Before the Affordable Care Act (ACA), those who lost ESI had limited options to acquire health insurance. However, after the ACA, those who lose ESI may be eligible for a subsidy to buy insurance from the Health Insurance Exchanges (HIX) in all states. Furthermore, they may enroll in Medicaid, especially if they live in a state that expanded the Medicaid program (36

[2] Unemployment Insurance Weekly Claims, Department of Labor, May 14, 2020. https://www.dol.gov/ui/data.pdf
[3] https://www.bls.gov/news.release/pdf/empsit.pdf
[4] https://www.pewresearch.org/fact-tank/2021/02/10/unemployed-americans-are-feeling-the-emotional-strain-of-job-loss-most-have-considered-changing-occupations/

states and Washington DC as of 2020)[5], and their income is below 138 percent of the federal poverty limit (FPL). Recent evidence suggests that the ACA has reduced the likelihood of being uninsured by six percentage points after losing a job (Agarwal & Sommers, 2020). About 60% of the reduction is due to the expansion of Medicaid, and the rest is driven by HIX (Agarwal & Sommers, 2020).

This paper uses data from the 2020 Household Pulse Survey (HPS), a nationally representative rapid response survey, and a difference-in-difference (DD) structure to show that Medicaid expansion mitigated job loss's adverse effects on mental health this pandemic. We use 27 rounds of the HPS covering the period from April 2020 to March 2021. We do not use data after March 2021 because the American Rescue Plan Act (ARPA) was passed in March 2021. The ARPA changed both Medicaid and HIX subsidies in important ways that would make combining the before ARPA and after ARPA period problematic.

The HPS administered the Patient Health Questionnaire-4 (PHQ-4) to assess respondents' mental health status. We use responses to these questions to compare the mental health outcomes of individuals who experienced a job loss (either their job or that of a family member) during the COVID-19 pandemic to those who did not in the expansion and non-expansion states. In the HPS data, we can distinguish between these two types of job losses: individuals who lost their jobs (first group or G1) and those who did not lose their job but have a family member who lost a job during the pandemic (second group or G2). These two groups are more likely to be affected by Medicaid expansion. On the other hand, individuals who neither lost their job nor have a family member who lost a job (third group or G3) are less likely to be affected by Medicaid expansion since they are (most likely) covered by Employer-Sponsored Insurance (ESI). Therefore, comparing the mental distress of G1 (or G2) with G3 in expansion and non-expansion states may allow us to estimate the effect of Medicaid expansion on job-loss-induced mental distress. Previous research has shown that access to Medicaid can improve mental health outcomes (Baicker et al., 2013) in the general population, but this paper aims to explore whether Medicaid mitigated a job loss's mental health consequences during the COVID-19 pandemic and

[5] The ACA mandated Medicaid expansion for all states. A Supreme Court ruling made the expansion optional for states. A total of 37 states (and Washington DC) expanded Medicaid before 1/1/2020. Nebraska started enrolling residents under the Medicaid expansion on 08/01/2020. We classify Nebraska as an expansion state. The results of this paper remain unchanged if we drop Nebraska.

the mechanisms behind it. This is an important question because one of the goals of social safety net programs is to work as a shock absorber in times of crisis. Therefore, how the ACA in general, and Medicaid expansion in particular, fared in that respect is an important question.

Next, we explore mechanisms. Medicaid may mitigate the adverse effects of job loss on mental health through two primary mechanisms. First, individuals may be able to access/utilize mental health services and prescription medications, reducing mental distress. An alternative explanation is that lower costs (and expected costs) associated with Medicaid may lower financial stress and food insecurity. Previous research has also shown that financial hardship (Butterworth et al., 2009) and especially food insecurity (Seifert et al., 2004; Weaver et al., 2021; Jones, 2017; Lund et al., 2010; Tribble et al., 2020;) is associated with poor mental health. The relationship between food insecurity and poor mental health outcomes persists even after controlling for socioeconomic status (Elgar et al., 2021; Sorsdahl et al., 2010). The exact mechanism behind this relationship remains unclear. A recent paper suggests that the psychological effects of not having enough or desired food and the uncertainty associated with future meals are more likely to explain the relationship between food insecurity and poor mental health than nutritional deficiency (Weaver et al., 2021). Therefore, we explore mechanisms through which Medicaid expansion affects the mental health of Americans.

We present our results in two steps. First, we show that individuals in expansion states are more likely to be covered by Medicaid following a job loss. Our estimates show that the respondents who live in expansion states are 96.6% (36.3%) more likely to have Medicaid coverage following their (family member's) job loss. Next, show that individuals in expansion states are 14.2% (7.6%) less likely to have moderate to severe mental distress following their job loss (job loss of a family member) than those living in non-expansion states.

Further analysis shows that individuals living in expansion states are about 9.2% less likely to be in financial distress and 13.6% less likely to be food insecure than their counterparts in non-expansion states. Therefore, economic security is a critical mechanism through which Medicaid reduces mental distress. We find limited evidence in favor of increased healthcare utilization in expansion states.

One potential problem with the above approach is that there may be differences in access to other social safety programs across states that affect unemployed people in expansion and

non-expansion states differently. Then the DD would be biased. To account for that, we compare the effect of Medicaid expansion on respondents just below the age of 65 (63-64) and just above 65 (66-67) and estimate a Difference-in-Difference-in-Difference (DDD) model. While we expect Medicaid expansion to affect 63-64-year-old respondents, there will be little or no effect among 66-67-year-old individuals since they are eligible for Medicare. Furthermore, most social safety programs (such as worker protection or food assistance) are not age-restricted. In addition, these individuals are of similar age, and therefore, we would expect their financial and health profiles to be similar. Now, any difference in state-level variation in safety programs will be differenced out. We show that our DDD estimates are similar to our DD estimates.

The rest of the paper is structured as follows. Section 2 explains some background materials, Section 3 describes the data, Section 4 discusses the results, and Section 5 concludes.

2. Background

The ACA created HIX in all states, but only some states (36 states and Washington DC as of 2020) expanded Medicaid coverage. Therefore, the central premise of this paper depends on Medicaid being more beneficial for mental health than health insurance brought through HIX. There may be several reasons; some are general, and some are specific to the COVID-19 pandemic.

First, Medicaid eligibility is based on current income. Therefore, even individuals who had a relatively high income in 2019 may become eligible for Medicaid if they lose their job and income falls below the cutoff level since the ACA removed the asset test for Medicaid eligibility. On the other hand, the HIX subsidy is determined by annual income. Therefore, even a few months of high income (for example, in the first three months of 2020, before the COVID-19 became a pandemic in the U.S.) may substantially reduce the subsidy.

Second, the Coronavirus Aid, Relief, and Economic Security (CARES) Act of 2020 stipulated that the COVID-19 specific additional unemployment benefits ($600 per week until July 31 of 2020, $300 per week as of March of 2021) do not count as income to determine

Medicaid eligibility, but that benefit counts as income to determine HIX subsidy[6]. This puts HIX consumers at a disadvantage compared to the Medicaid population.

Furthermore, Medicaid has very little or no cost-sharing requirements (Brooks et al., 2019) in most states, which may mean that the out-of-pocket cost of Medicaid beneficiaries may be lower than those with HIX plans, even after accounting for the COVID-19 related expansion of Annual Premium Tax Credit (APTC) and Cost Sharing Reduction (CSR) subsidies associated with HIX plans. These Out-of-pocket costs are a big concern, even for individuals and families with health insurance. More than 40% of all nonelderly adults in the U.S. report financial distress induced by medical expenditure (Doty et al., 2008). A majority (61%) of these individuals experienced medical expenditure induced financial hardship despite having health insurance. This suggests that just having health insurance is not enough. It has to be affordable.

Moreover, 29% of all nonelderly adults reported not paying for basic needs such as food or rent because medical expenditure induced financial hardship (Doty et al., 2008). Over the past few years, research has shown that Medicaid expansion has reduced out-of-pocket expenditures (Golberstein et al., 2015), reduced unpaid medical bills (Hu et al., 2016), improved credit scores, and reduced bankruptcy (Miller et al., 2008). Other researchers have reported that Medicaid expansion may reduce food insecurity (Himmelstein 2019).

Third, The CARES Act increased the federal medical assistance percentage (FMAP) by 6.2 percentage points. However, this increase was not applicable to the population that is covered under the ACA Medicaid expansion. Therefore, this would have affected expansion and non-expansion states symmetrically. However, the CARES Act of 2020 also stipulated that to be eligible for the 6.2 percentage point increase in FMAP, states must provide continuous eligibility to all Medicaid recipients who become eligible for Medicaid on or after March 18, 2020, as long as the COVID-19 public health emergency (PHE) is in effect. The PHE was in effect for our entire sample period. This continuous eligibility meant that individuals, once in Medicaid, could remain in Medicaid irrespective of any changes in their circumstances. Please note that while the increased FMAP did not apply to the ACA population, the continuous coverage mandate did.

[6] This rule was changed in the American Rescue Plan Act (ARPA) in March of 2021. However, our data does not include the period after ARPA.

3. Data

We use data from the 2020 Household Pulse Survey (HPS), a nationally representative rapid response survey conducted by the U.S. Census Bureau and designed to measure the effects of the COVID-19 in the U.S. It was conducted weekly from April to July 2020 and then bi-weekly. We use 27 rounds of the HPS covering the period from April 2020 to March 2021. As we mentioned before, we do not use data after March 2021 because the American Rescue Plan Act (ARPA) was passed in March 2021.

The HPS contains information on the respondents' mental health and a plethora of demographic and socioeconomic information on responding households. Our primary focus is on nonelderly adults (age<65) since individuals above 65 are eligible for Medicare and are unlikely to be affected by Medicaid expansion.

Our data consists of 1,724,069 person-round observations. Among them, 1,507,313 respondents have valid (non-missing) observations for all four questions about mental distress (PHQ-4). We exclude individuals who are retired and disabled or lost jobs before the COVID-19 pandemic (207,811 observations). We exclude individuals who lost jobs before the COVID-19 pandemic because these job losses may be tied to individual-specific causes. On the other hand, most job losses during the COVID-19 pandemic were mass layoffs. Finally, a further 427,074 observations are excluded because of missing control variables, leaving us with a final sample size of 872,428.

Several studies on the effects of the Medicaid expansion (using the expansion of Medicaid under the ACA) on various outcomes focus on individuals with high school or less education because they are more likely to be eligible for Medicaid. However, the massive job destruction during the COVID-19 pandemic meant that a wider array of people became eligible for Medicaid. For example, less than half of the respondents on Medicaid had high school (or less) education in our data. Therefore, in our baseline analysis, we included all respondents. We report estimates for respondents with high school or less education as a robustness check. The results are similar to the full sample.

The HPS administered the PHQ-4 questionnaire to assess respondents' mental health status. There are four questions in this questionnaire, and each question is answered on a zero to three scale. The first two questions asked the respondents how anxious and worried they were,

and the last two questions asked how often they felt depressed or uninterested during the two weeks before an interview. A combined score of three or more from the first two questions suggests moderate or severe anxiety, and a combined score of three or more from the last two questions suggests moderate or severe depression. Finally, a combined score of six or more from all four questions suggests moderate to severe mental distress. We use these three variables as our outcome variables to explore how Medicaid expansion mitigated the effects of job loss on mental distress.

4. Results

4.1. Empirical Strategy

We use DD regressions to estimate the effect of Medicaid expansion after controlling for several control variables and state-level fixed effects.

We estimate the following regression

$$O_i = \delta X_i + S_i + \alpha Expan_i + \beta_1 G_{1i} + \beta_2 G_{2i} + \gamma_1 G_{1i} * Expan_i + \gamma_2 G_{2i} * Expan_i + \epsilon_i \qquad (1)$$

In regressions, O_i is the outcome variable. We control for several demographic, socioeconomic variables, and round fixed effects (X_i). We also include state of residence (S_i) fixed effects. In addition to individual and household characteristics, we also control for local COVID-19 conditions by using Johns Hopkins University (JHU) data on COVID-19 activity. Since the state dummies are included in the regressions, the parameters are identified from within state variations; therefore α is not identified. However, this reduces the probability that unobserved state-level characteristics are driving the results. Our primary parameters of interest are γ_1 and γ_2, which are the DD estimates of the effect of Medicaid expansion on job-loss-induced mental distress. Since most of our outcome variables are categorical, we use Logit or Ordered Logit models and report the estimated odds ratios. All standard errors are clustered at the state level.

We begin with the prevalence of mental distress in expansion and non-expansion states and the corresponding mean DD estimates for all three groups. Next, we show that individuals in expansion states are more likely to be covered by Medicaid following a job loss than those in non-expansion states. If access to Medicaid is the reason behind the difference in outcomes across these two types of states, we should see increased Medicaid coverage among individuals

in expansion states following a job loss. Then we estimate the effect of Medicaid expansion on job-loss-induced mental distress. Next, we explore the mechanisms through which Medicaid may affect job-loss-induced mental distress.

Finally, we explore whether our DD results have a causal interpretation. DD estimates are causal if the trends in the treatment and control groups would have been the same without the intervention (parallel trends assumption). Testing this assumption is never feasible. Instead, if researchers have multiple periods of pre-intervention data for both the groups, they can test whether the trends in treatment and control groups had similar trends before the treatment or intervention. We do not have a before-after structure. Therefore, the traditional way of checking for parallel trends is not feasible in our context. Therefore, we rely on placebo testing. We do this in multiple ways:

1. We show that the prevalence of COVID-19 and its impact on the economy (as proxied by the rate of job loss or program participation such as the Supplemental Nutrition Assistance Program or SNAP) was similar in expansion and non-expansion states
2. We show that there is no treatment effect on variables where we would not expect any treatment effect (such as demographic characteristics such as race, gender etc.).
3. This still leaves the possibility of unobserved state-level differences, such as the availability of other social safety net programs. If these differences affect employed and unemployed similarly, state fixed effects will account for that. However, if there may be differences in other social safety programs across states that affect unemployed people in expansion and non-expansion states differently, the DD estimates may be biased. To account for that, we compare the effect of Medicaid expansion on respondents below the age of 65 (63-64) and above 65 (66-67) and estimate a Difference-in-Difference-in-Difference (DDD) model. We picked these age windows to exploit the fact that an individual becomes eligible for Social Security at age 62, though at a reduced benefit (for example for an individual for in 1958 would receive 28% less benefit compared to if they retired at 66 years and eight months, which is the full-benefit retirement age for that cohort). In addition, since we only know the birth year and not the birth month, we do not know their exact age (i.e., accurate at the month level). Therefore, we exclude the boundary ages (age 62 for social security eligibility and 65 for Medicare eligibility) to

avoid misclassifying people. While we expect Medicaid expansion to affect 63-64-year-old respondents, there will be little or no effect among 66-67-year-old individuals since they are eligible for Medicare. Furthermore, most other social safety programs (such as worker protection or food assistance) are not age-restricted. In addition, these individuals are of similar age, and therefore we would expect their financial and health profiles to be similar. Now, any difference in state-level variation in safety programs will be differenced out.

We should note that if a family member lost a job, the HPS did not ask who that family member was or what the family member's age was. Since Medicare eligibility is based on the age of the relevant family member (not the respondent), this analysis is meaningful only when the respondent himself or herself lost a job. We show that our DDD estimates are similar to our DD estimates.

4.2 Mean DD

4.2.1 Outcome variables

Panel A of Figure 1 shows the prevalence of mental distress in expansion and non-expansion states in three groups. As we defined earlier, G1 consists of individuals who lost their jobs, and G2 consists of individuals who did not lose their job but a family member lost a job during the pandemic. Individuals from households without any job loss are in the third or the control group (G3). The prevalence of moderate or severe mental distress in G3 (last two bars of Panel A) is higher in the expansion states (21.0%) than in the non-expansion states (20.1%). However, moderate or severe mental distress is less prevalent in G1 in the expansion states (44.3%) than in the non-expansion states (46.2%).

Therefore, the mean DD estimate (Panel B) suggests that respondents in expansion states are 2.8 percentage points (p-value<0.001) less likely to suffer from moderate or severe mental distress following own job loss (G1), and 1.4 percentage points (p-value<0.001) less likely to suffer from moderate or severe mental distress following the job loss of a family member (G2). Finally, panel C presents the mean DD estimates using the odds ratios, which suggests that the estimated effect is about 13% (p-value<0.001) for G1 and about 7.6% (p-value<0.001) for G2.

4.2.2 Control variables

We present the summary statistics for all the control variables in Appendix Table A1. We present the summary stats separately for each group and by whether they live in an expansion state or not. The first two columns show the statistics for those who lost their job (G1), the next two for those who have a family member lost a job (G2), and the final two columns are for those who did not experience any job loss during the pandemic (G3). The summary statistics show some differences across groups (for example, in expansion states, 40% of G1 in has a college degree or more vs. 68% of G3). However, this is less of a concern in this study because our primary goal is not to identify how job losses affect mental health. In addition, most of the job losses were mass layoffs in nature, which means individuals lost their jobs because of economic shocks brought on by the pandemic and not because of performances or characteristics.

Since parallel trend assumption or its variants cannot be tested in the current context, we check 1) if the prevalence of COVID-19 and its impact on the economy were different in expansion and non-expansion states, or 2) if there is a significant difference-in-difference (DD) in the demographics of the individuals who lost their jobs and those who did not in expansion and non-expansion states.

In our data, there are no differences in job loss rates (p-value 0.99), SNAP participation rates (p-value 0.53), and COVID-19 death rates per million resident (p-value 0.29) among expansion and non-expansion states. It is important to note that our sample period (from April 2020 to March 2021) is mostly before vaccines became widely available in the U.S. The death rates may have differed after vaccines became widely available.

Second, there is little difference within a group across expansion and non-expansion states (for example, among G1, 40% of G1 has a college degree or more in expansion states vs. 36% in non-expansion states; column1 vs. column2). In other words, the summary statistics suggest that the type of individuals who lost jobs (G1) in expansion and non-expansion states are similar (column 1 vs. column 2). In the same vein, individuals who did not have a job loss (G3) in expansion and non-expansion states are similar (column 5 vs. column 6). Therefore, the differences between the groups are also similar in expansion and non-expansion states.

To test this, we report the mean DD for each of the control variables. We create binary variables for non-binary variables (such as age, education, household income, number of children) by dividing the sample into two segments: below and above the median. The median respondent in the sample is 44 years old, has less than a college education, household income between $75,000 and $100,000, and does not have a child.

Figure 2 shows the mean DD estimates for all the control variables. We estimate equation (1) for each control variable (as outcome) but without any additional control variables. Therefore, the coefficient of the interaction term represents the mean DD. We do not find any difference in race, ethnicity, gender, marital status, education, or income. Even though the DD estimates are statistically significant for the age variable for G1 and G2 and the proportion of respondents with children for G1, these differences are minor from a pragmatic perspective. These results suggest that the difference between the respondents who lost jobs and those who did not are similar (with minor exceptions) in expansion states and non-expansion states.

In addition to individual characteristics, we also control for local COVID-19 conditions by using data from Johns Hopkins University (JHU) on COVID-19 activity. The JHU publishes the cumulative number of cases and deaths for each state at a daily frequency. We assign the numbers associated with the middle day of any round to that round. For example, if a round was from the first to the 15th of a month, we take the 8th day and assign the COVID-19 activity data from that day to that round of the HPS. We use these two measures of COVID-19 activity: number of cases per day and number of deaths per day. We normalize these numbers to the average number of cases and deaths per million residents for each state. In our data, the average number of cases per million residents is about 200, and the average number of deaths per million residents is about four.

4.3 Medicaid expansion and insurance coverage

Next, we explore whether individuals in expansion states are more likely to be covered by Medicaid following a job loss. To that effect, we estimate equation (1). We use logistic regression with insurance status as the outcome variable. The estimated odds ratios for all variables (including the control variables) are shown in the Appendix Table A2. The left panel of Figure 3 shows that respondents in expansion states are 21.7% (p-value 0.024) more likely to have insurance coverage following their job loss (G1). The increased insurance coverage is

driven by a 96.6% (p-value <0.001) increase in Medicaid coverage. There are no significant differences in ESI rates or insurances brought through HIX.

We do not find any effect of Medicaid expansion on overall insurance coverage following the job loss of a family member. However, our estimates show that those who live in expansion states are 36.3% (p-value <0.001) more likely to have Medicaid coupled with a 5.7% (p-value 0.054) decline in ESI coverage following a job loss of a family member than those living in non-expansion states.

4.4 Medicaid expansion and mental distress

Next, we address our primary question: the effect of Medicaid expansion on mental distress. Before discussing the parameters of primary interest, we briefly discuss the estimates for control variables. Table A3 in the Appendix presents the odds ratios from Logit models. The first column is for moderate or severe distress, and the following two columns are for the two components: anxiety and depression. The first column shows that older respondents, female respondents are likely to report mental distress. Married respondents, respondents with children, and non-white respondents are less likely to report mental distress. Education is not significantly associated with distress, but income is. Respondents from higher-income families are less likely to report mental distress.

Panel A of Figure 4 presents the results for the outcome variables are: moderate or severe distress, anxiety, and depression. The left panel shows the odds ratios for G1, and the right panel presents the odds ratios for G2. The left panel shows that the odds ratio for mental distress of G1 (own job loss) is 0.858 (p-value <0.001), or in other words, respondents who live in expansion states are about 14.2% less likely to have moderate to severe mental distress after a job loss compared to those who live in non-expansion states. This estimate is similar to the mean DD estimate reported in Section 4.2. The results for the two components of mental distress (anxiety and depression) are similar to the results for overall mental distress. The odds ratio for anxiety is 0.857 (p-value<0.001) and 0.861 (p-value<0.001) for depression. These results suggest that the Medicaid expansion reduced both anxiety and depression associated with job loss.

Panel A's right panel shows that the respondents who live in expansion states are about 7.6% (p-value <0.001) less likely to have moderate to severe mental distress following the job

loss of a family member (G2) than those who live in non-expansion states. The results for the two components of mental distress (anxiety and depression) are similar to the overall mental distress for G2.

We also estimated an Ordered Logit model where the outcome variable may take the values one (no mental distress; PHQ score<=2), two (low mental distress; 3<=PHQ score<=5), three (moderate mental distress; 6<=PHQ score<=8), or four (severe mental distress; PHQ score>=9). The estimated odds ratios from the Ordered Logit model are presented in Panel B of Figure 4. The results are similar to the results presented in Panel A.

In Panel C, we explore the heterogeneity in the effect of Medicaid expansion across racial and ethnic groups. The estimates suggest that the protective effect of Medicaid expansion is benefiting all racial and ethnic groups. Medicaid expansion reduced moderate to severe distress by 16.5% (p-value <0.001) among whites, by 7.3% (p-value: 0.074) among blacks and 13.3% among Hispanics (p-value: 0.004). The relatively large effect on white respondents is somewhat surprising but most likely represents that the job loss was across the board and not restricted to a few occupations.

4.5 Why? Exploring mechanisms

Next, we explore how Medicaid expansion reduces mental distress. In the Introduction, we discussed two primary mechanisms: more healthcare utilization and reduced food insecurity or financial stress. We first check whether individuals in expansion states use more mental health services than those in non-expansion states. In the HPS, respondents were asked whether they had used any mental health services (such as therapy or counseling) in the four weeks preceding an interview. They were also asked about mental-health-related prescription drug use in the two weeks preceding an interview. We use these two outcome variables to assess the effect of Medicaid expansion on access. Previous research has shown that Medicaid expansion has increased diagnosis of chronic conditions (which implies increased access and utilization of healthcare services) and prescription drug use among eligible population including substance abuse disorder patients (Maclean & Saloner, 2019; Ghosh Simon & Sommers, 2019; Miller & Wherry, 2019). The odds ratios are presented in Panel A of Figure 5. The results suggest no difference in either mental health-related visits or prescription drug use between groups in expansion and non-expansion states. In Panel B, we present the odds ratios among those who

report moderate or severe mental distress. Even in this case, mental health services usage has no effect, but the individuals in the expansion states are 9.2% (p-value 0.043) more likely to use a prescription drug following a job loss than their counterparts in non-expansion states. We do not find any effect of Medicaid expansion on mental health care usage.

Next, we explore whether Medicaid expansion improved financial security among those who lost jobs during the pandemic. In the HPS data, the respondents were asked about general financial wellbeing and food security. The financial wellbeing question asked whether they had difficulty paying for usual household expenses (such as food, rent, bills) in the seven days preceding an interview. The possible answers are no, little, some, or extreme difficulty. We use an Ordered Logit model to estimate the effect of Medicaid expansion on financial stress. The results are presented in Panel C of Figure 5. The estimates suggest that individuals living in expansion states are about 9.2% (p-value 0.003) less likely to be in financial distress following a job loss than their counterparts in non-expansion states. There is no significant effect of Medicaid expansion on financial stress following the job loss of a family member.

The HPS also asked a specific question about food insecurity. As discussed earlier, food insecurity (Seifert et al., 2004; Weaver et al., 2021; Jones, 2017; Lund et al., 2010; Tribble et al., 2020;) is associated with poor mental health. The estimated odds ratios from food security regression suggest that the respondents in the expansion states are about 13.5% (p-value <0.001) less likely to have moderate or severe food insecurity following a job loss than their counterparts in non-expansion states. In addition, the respondents in the expansion states are about 8.6% (p-value<0.001) less likely to have food insecurity following the job loss of a family member than their counterparts in non-expansion states. As we discussed earlier, financial stress and food insecurity can contribute to mental distress. These results suggest that Medicaid can reduce mental distress by providing more economic security.

One concern with this result may be that the expansion states also have other social safety programs. First, we should note that there are no differences in job loss rates (p-value 0.99), SNAP participation rates (p-value 0.53) across expansion and non-expansion states. However, since we cannot check for all programs, we use a DDD structure to rule out such possibilities. We discuss that in Section 4.6.2.

4.6 Robustness checks

4.6.1 Restricting the sample to respondents with High school or less education.

As we discussed in the Data section, in our baseline analysis, we included all respondents. One concern with that may be the potential for increased unobserved heterogeneity. Therefore, in this section, we restrict our sample to respondents with high school or less education to evaluate the effect of Medicaid expansion. For this part, we focus only on G1 (own job loss). The estimated odds ratios, presented in Figure A1 in the Appendix, show that the Medicaid expansion increased Medicaid coverage increased by 40.1% and correspondingly reduced moderate to severe mental distress by 17.5% in the expansion states following a job loss.

4.6.2 Using Medicare eligibility as a placebo test.

To ensure that our results are not driven by unobserved state-level differences (such as social safety programs that may asymmetrically affect the employed and unemployed), we compare the effect of Medicaid expansion on respondents just below 65 (63-64) and above 65 (66-67). While we expect Medicaid expansion to affect 63–64-year-old respondents, there will be little or no effect among 66-67-year-old individuals since they are eligible for Medicare. The advantage with DDD is that even in the presence of differences in social safety programs across expansion and non-expansion states, the DDD estimates will still be consistent, as long as those programs are also not age-restricted.

It is important to note that a substantial number (7.2 million[7]) of low-income above 65 individuals are eligible for both Medicaid and Medicare (dual eligible). While there is substantial inter-state variation in the dual-eligibility criteria (Musumeci Chidambaram & Watts, 2019), most states restrict dual eligibility to low-income, low-asset, and disabled seniors (such as seniors on Supplemental Security Income or SSI, which only allows assets up to $2000 for

[7] https://www.medicaid.gov/medicaid/eligibility/seniors-medicare-and-medicaid-enrollees/index.html#:~:text=In%20total%2C%2012%20million%20people,both%20optional%20and%20mandatory%20categories. , Accessed on 05/09/2021.

individuals and $3000 for couples). Therefore, we expect the impact of Medicaid expansion to be limited to none among seniors.

Figure 6 presents the results. As we argue in Section 4.1, this analysis is meaningful only when the respondent lost a job. The odds ratios from the DDD regression on insurance status (top panel) show that the Medicaid expansion increased the probability of Medicaid coverage by 115% among those who lost their jobs in expansion states. However, there is no statistically significant change in coverage through employers (ESI) or marketplace (HIX). Consequently, Medicaid expansion reduced moderate to severe mental distress by 28% (bottom panel). Again consistent with previous results, we find that Medicaid expansion reduces mental distress through reduced food insecurity. Given that the DDD estimates are similar to DD results, we conclude that our estimated effect is indeed the effect of Medicaid expansion.

5. Conclusion

One of the goals of social safety programs is to work as a shock absorber in times of crisis. The COVID-19 pandemic was a once-in-a-century health crisis. We show that the Medicaid expansion mitigated the adverse effects of job loss on mental health during the COVID-19 pandemic. Moreover, we show that the economic security provided by Medicaid is as important (if not more) as access to healthcare. While the access to healthcare aspect of health insurance in general and Medicaid, in particular, has been widely discussed, the economic security aspect of Medicaid has received less attention. This paper shows that Medicaid worked as a significant shock absorber in a time of great health crisis, not just by providing more access to healthcare but also by providing economic security during the COVID-19 pandemic.

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Figure 1: Prevalence of Anxiety, Depression, and Distress

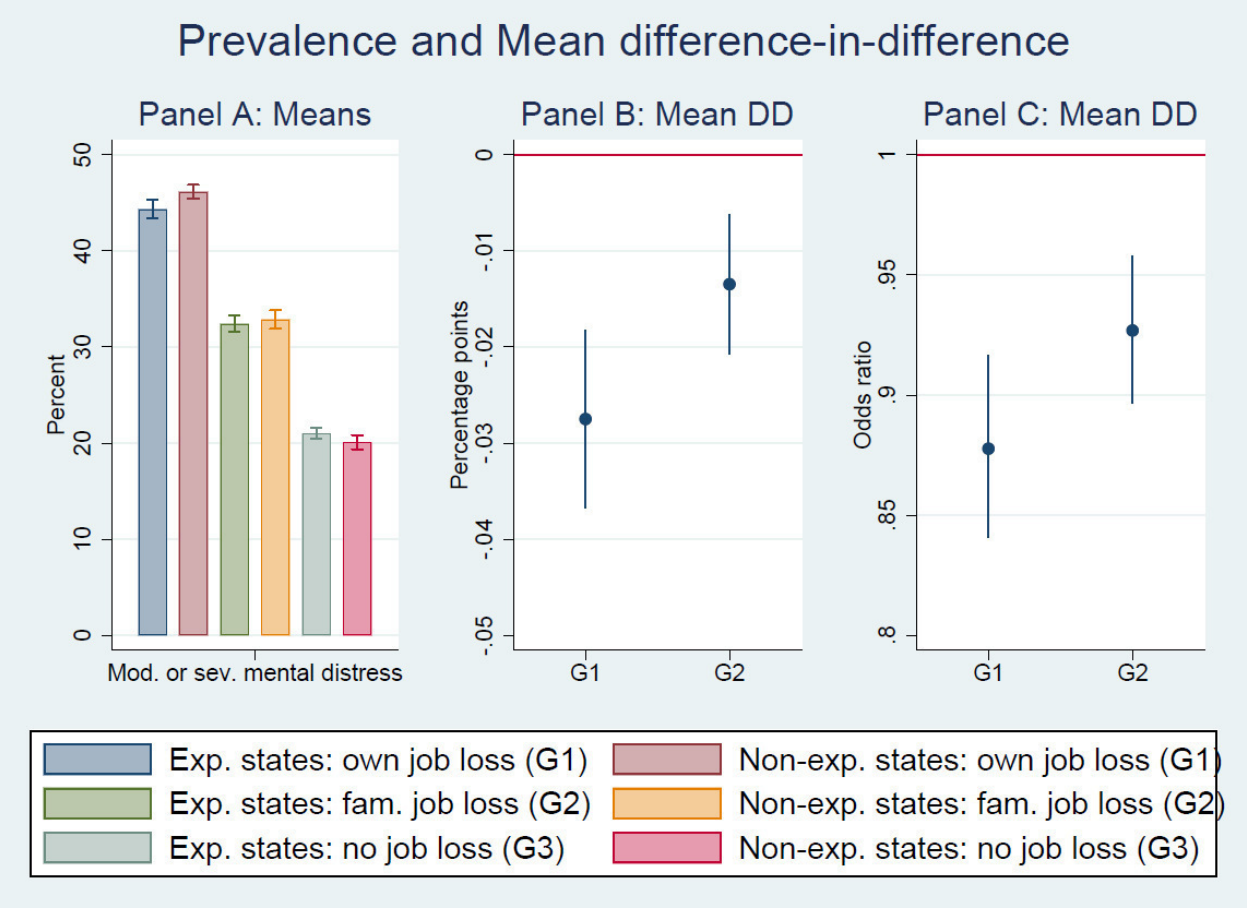
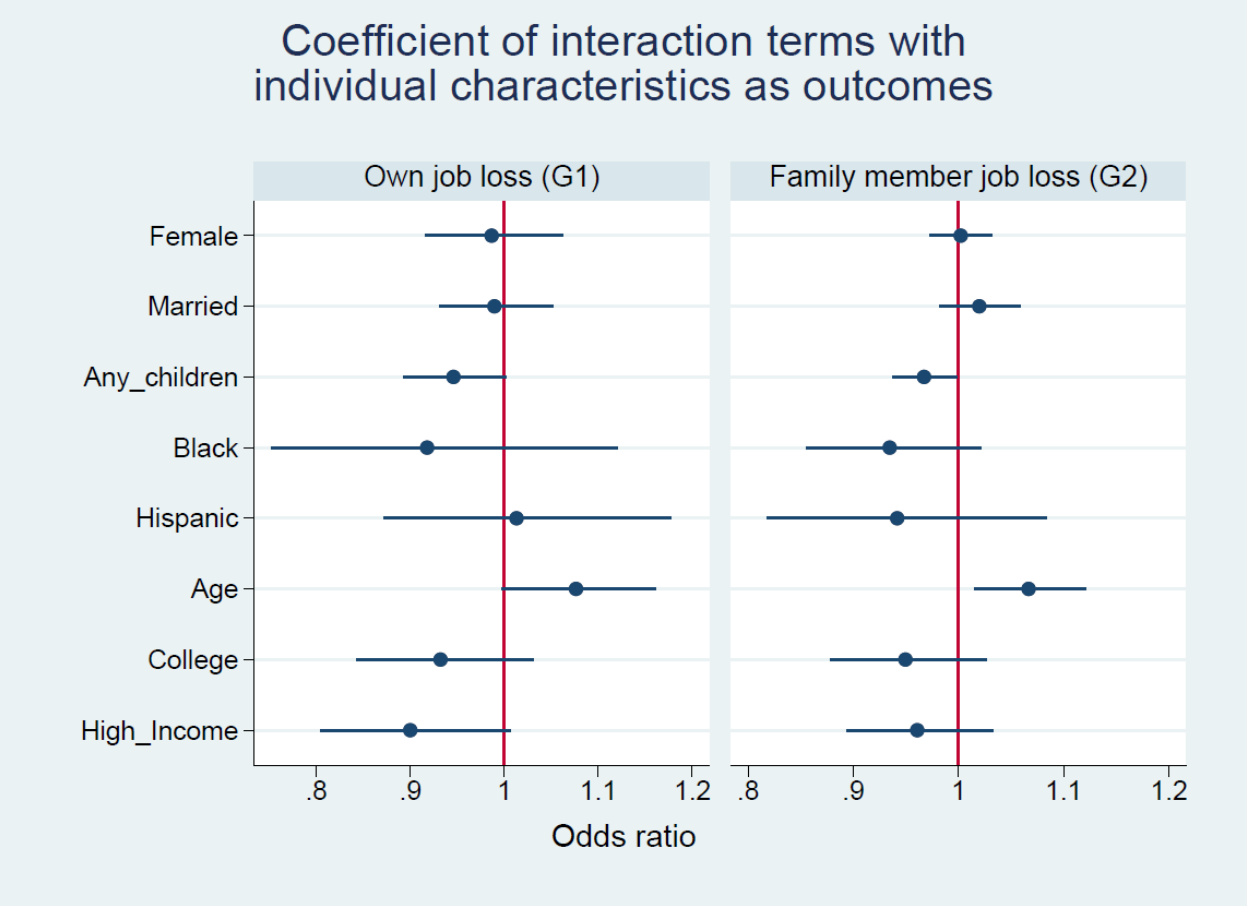


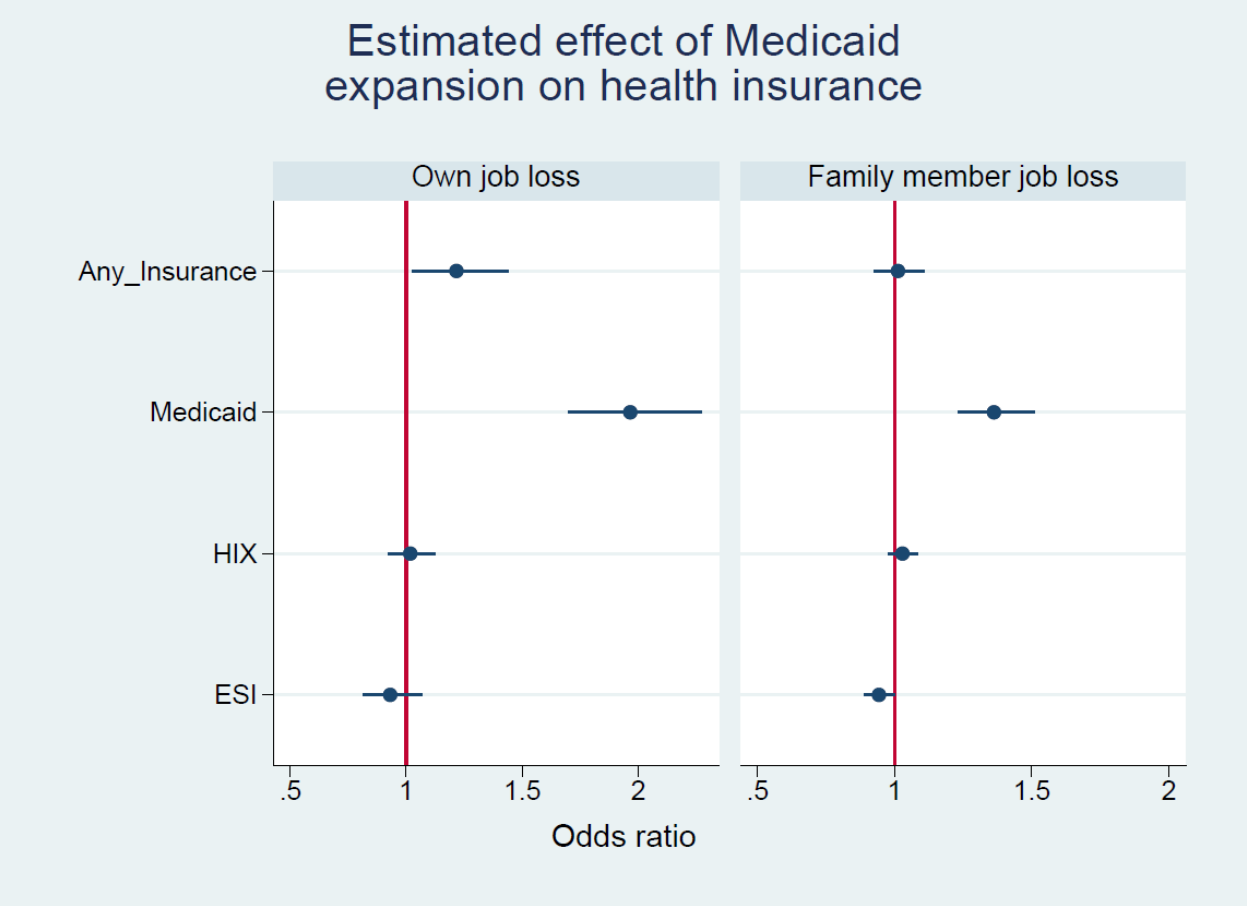
Figure 2: Mean D.D. for controls



Note1: The period covered spans from April 2020 to March 2021. For each control variable, we estimate a Logistic regression (as in eq. (1)) with group status (G1 and G2), expansion status and the corresponding interaction terms as independent variables (without any control variables). The figure above presents the estimated odds ratios corresponding to the interaction terms.

Note2: 95% confidence intervals are based on standard errors clustered at the state level.

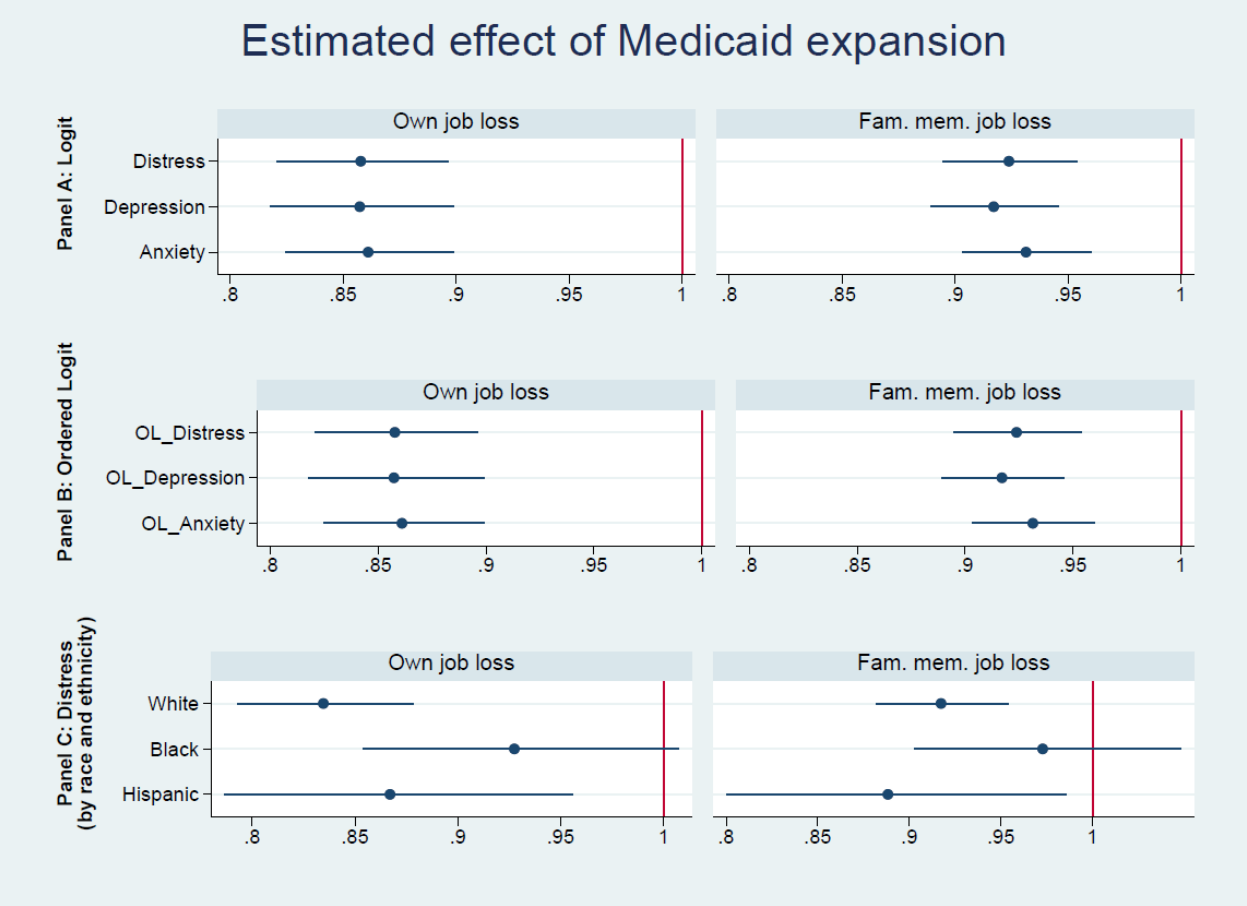
Figure 3: Effect of Medicaid expansion on health insurance coverage



Note1: The period covered spans from April 2020 to March 2021. Estimated odds ratios are for interaction terms from Logistic regressions. Controls include gender, marital status, age, age squared, number of children, educational categories, income categories, state-level COVID-19 cases per day, state-level COVID-19 deaths per day, and state fixed effects.

Note2: 95% confidence intervals are based on standard errors clustered at the state level.

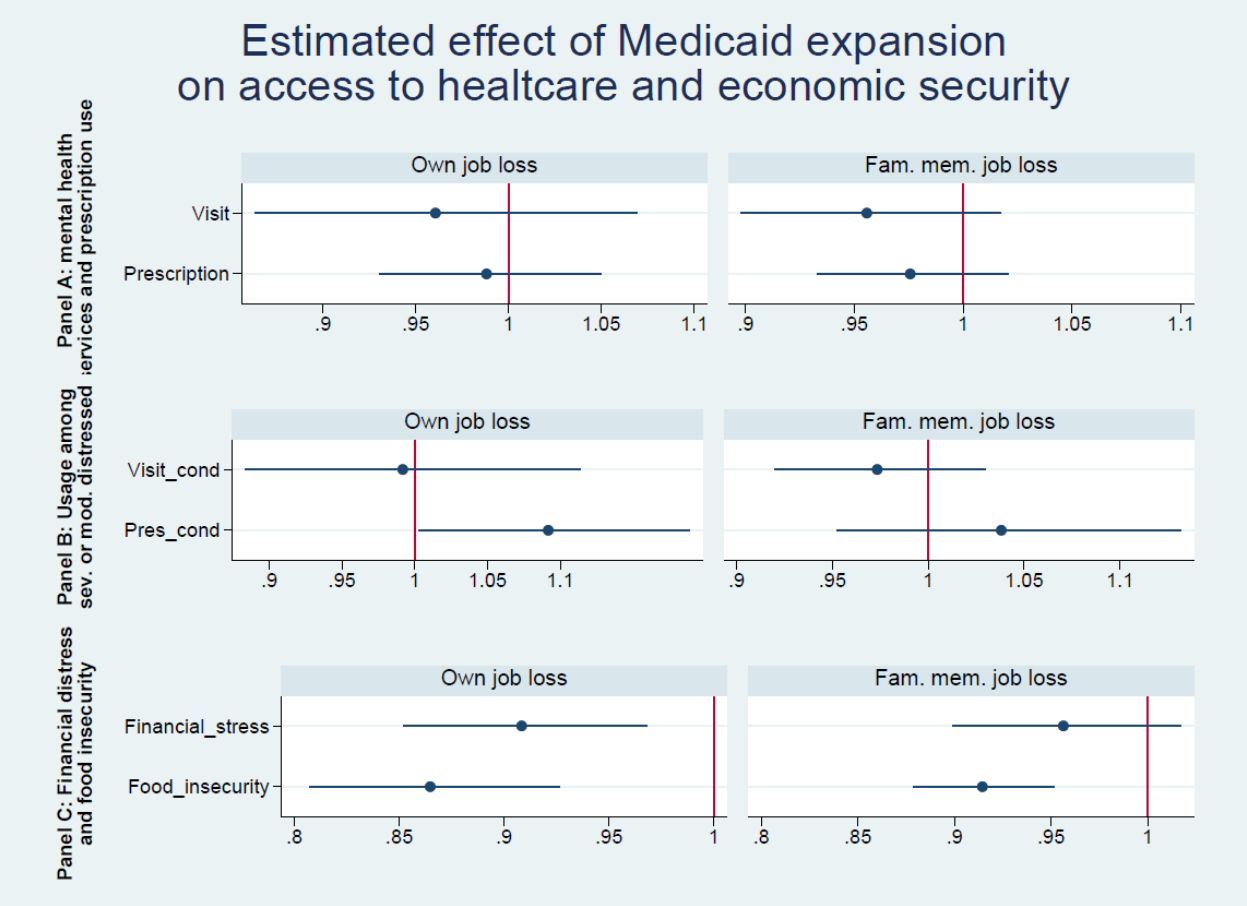
Figure 4: Effect of Medicaid expansion on mental distress



Note1: The period covered spans from April 2020 to March 2021. Estimated odds ratios are for interaction terms from Logistic regressions. Controls include gender, marital status, age, age squared, number of children, educational categories, income categories, state-level COVID-19 cases per day, state-level COVID-19 deaths per day, and state fixed effects.

Note2: 95% confidence intervals are based on standard errors clustered at the state level.

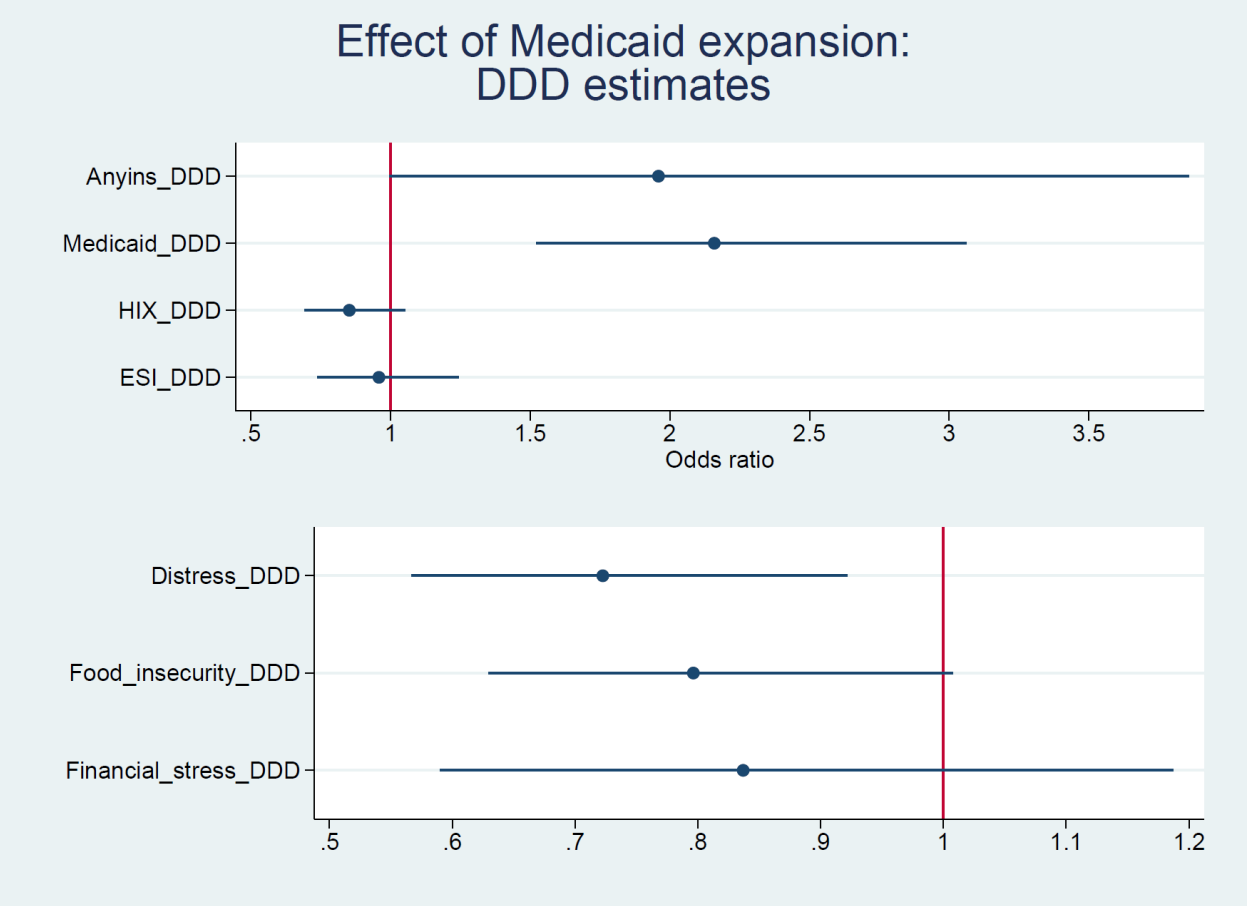
Figure 5: Effect of Medicaid expansion on access to healthcare and economic security



Note1: The period covered spans from April 2020 to March 2021. Estimated odds ratios are for interaction terms from Logistic regressions. Controls include gender, marital status, age, age squared, number of children, educational categories, income categories, state-level COVID-19 cases per day, state-level COVID-19 deaths per day, and state fixed effects.

Note2: 95% confidence intervals are based on standard errors clustered at the state level.

Figure 6: DDD estimates from 63-67 year old respondents

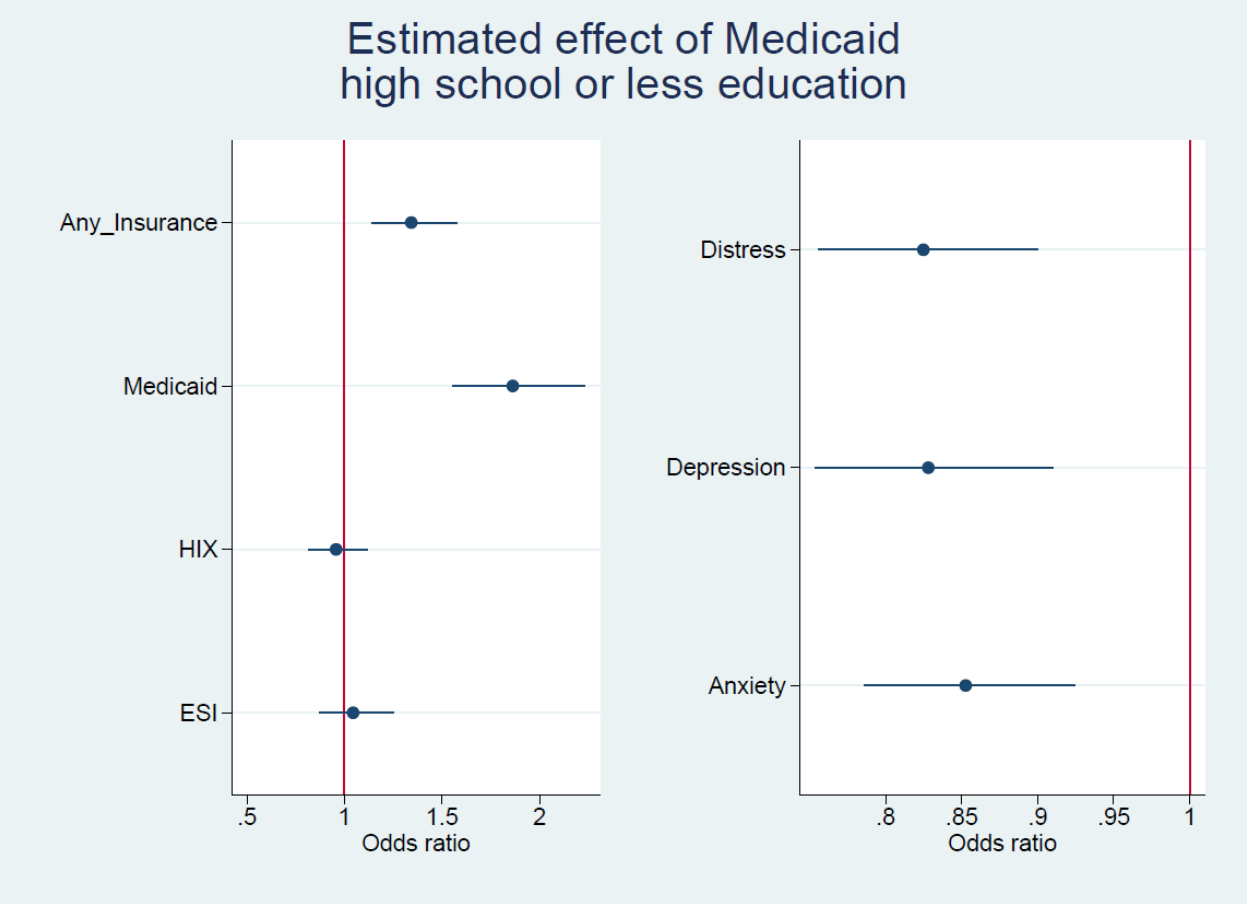


Note1: The period covered spans from April 2020 to March 2021. Estimated odds ratios are for interaction terms from Logistic regressions. Controls include gender, marital status, age, age squared, number of children, educational categories, income categories, state-level COVID-19 cases per day, state-level COVID-19 deaths per day, and state fixed effects.

Note2: 95% confidence intervals are based on standard errors clustered at the state level.

Appendix

Figure A1: Effect of Medicaid expansion on respondents with high school or less education



Note1: The period covered spans from April 2020 to March 2021. Estimated odds ratios are for interaction terms from Logistic regressions. Controls include gender, marital status, age, age squared, number of children, educational categories, income categories, state-level COVID-19 cases per day, state-level COVID-19 deaths per day, and state fixed effects.

Note2: 95% confidence intervals are based on standard errors clustered at the state level.

Table A1: Summary statistics: by group and by expansion status

	Lost their jobs		A family member lost their job		No loss of jobs	
	Expansion	Not	Expansion	Not	Expansion	Not
Age	44.00	43.93	43.94	43.93	43.78	44.16
	(11.88)	(11.81)	(11.31)	(11.21)	(10.95)	(11.13)
Female	0.65	0.66	0.60	0.61	0.58	0.58
	(0.477)	(0.474)	(0.490)	(0.488)	(0.494)	(0.493)
Married	0.47	0.48	0.59	0.60	0.60	0.61
	(0.499)	(0.500)	(0.491)	(0.490)	(0.491)	(0.489)
# Children	0.88	0.95	0.85	0.90	0.82	0.83
	(1.192)	(1.224)	(1.134)	(1.152)	(1.109)	(1.111)
Race						
White	0.75	0.72	0.82	0.79	0.83	0.82
	(0.431)	(0.450)	(0.384)	(0.406)	(0.372)	(0.384)
Black	0.10	0.19	0.06	0.12	0.06	0.10
	(0.300)	(0.390)	(0.246)	(0.329)	(0.232)	(0.305)
Asian	0.06	0.03	0.05	0.03	0.06	0.04
	(0.242)	(0.170)	(0.226)	(0.171)	(0.245)	(0.187)
Other	0.08	0.06	0.06	0.05	0.05	0.04
	(0.276)	(0.246)	(0.240)	(0.227)	(0.207)	(0.196)
Education						
Less than HS	0.01	0.01	0.00	0.01	0.00	0.00
	(0.100)	(0.100)	(0.0647)	(0.0741)	(0.0455)	(0.0513)
Some HS	0.02	0.03	0.01	0.01	0.01	0.01
	(0.155)	(0.169)	(0.102)	(0.117)	(0.0733)	(0.0857)
HS degree	0.16	0.17	0.10	0.12	0.07	0.09
	(0.366)	(0.379)	(0.305)	(0.320)	(0.261)	(0.280)
Some college	0.29	0.29	0.22	0.24	0.16	0.18
	(0.452)	(0.454)	(0.415)	(0.426)	(0.363)	(0.385)
Assoc. degree	0.12	0.14	0.11	0.13	0.09	0.10
	(0.329)	(0.345)	(0.319)	(0.331)	(0.284)	(0.303)
College deg.	0.27	0.24	0.31	0.29	0.35	0.34
	(0.442)	(0.427)	(0.463)	(0.455)	(0.475)	(0.474)
Graduate deg.	0.13	0.12	0.24	0.21	0.33	0.28
	(0.338)	(0.324)	(0.424)	(0.407)	(0.470)	(0.449)
Income						
<25K	0.21	0.25	0.08	0.10	0.04	0.05
	(0.409)	(0.431)	(0.269)	(0.306)	(0.192)	(0.228)
$25K - $35K	0.13	0.14	0.08	0.10	0.05	0.07
	(0.338)	(0.350)	(0.274)	(0.303)	(0.217)	(0.248)
$35K - $50K	0.13	0.14	0.11	0.12	0.08	0.10
	(0.342)	(0.349)	(0.311)	(0.329)	(0.268)	(0.298)

$50K - $75K	0.17	0.17	0.18	0.19	0.15	0.18
	(0.380)	(0.380)	(0.384)	(0.395)	(0.361)	(0.385)
$75K - $100K	0.12	0.11	0.16	0.16	0.15	0.16
	(0.330)	(0.316)	(0.364)	(0.362)	(0.360)	(0.368)
$100K - $150K	0.13	0.11	0.20	0.18	0.23	0.22
	(0.332)	(0.307)	(0.402)	(0.382)	(0.422)	(0.414)
$150K - $200K	0.05	0.04	0.10	0.07	0.13	0.11
	(0.218)	(0.198)	(0.295)	(0.259)	(0.335)	(0.307)
>$200,000K	0.05	0.03	0.10	0.07	0.17	0.11
	(0.209)	(0.184)	(0.295)	(0.259)	(0.372)	(0.318)
Hispanic	-0.11	-0.13	-0.09	-0.11	-0.06	-0.08
	(0.317)	(0.337)	(0.283)	(0.312)	(0.245)	(0.265)
tcovrate	146.01	181.14	163.81	201.48	159.43	192.46
	(189.5)	(179.5)	(210.8)	(203.7)	(203.6)	(199.8)
drate	3.18	2.58	2.92	2.72	3.02	2.64
	(3.941)	(2.036)	(3.540)	(2.353)	(3.685)	(2.384)
N	115369	43750	195536	73187	323078	121508

Note: S.D. in parentheses

Table A2: Estimated odds ratios for health insurance coverage

	(1)	(2)	(3)	(4)
VARIABLES	Any insurance	Medicaid	HIX	ESI
Age	0.924***	1.077***	0.942***	0.974***
	(0.00429)	(0.00734)	(0.00301)	(0.00378)
Age squared	1.001***	0.999***	1.001***	1.000***
	(5.23e-05)	(7.82e-05)	(3.44e-05)	(4.32e-05)
Female	1.504***	1.481***	0.943***	1.195***
	(0.0252)	(0.0287)	(0.00906)	(0.0125)
Married	1.461***	0.757***	1.084***	1.436***
	(0.0243)	(0.0153)	(0.0143)	(0.0250)
Black	1.109***	1.334***	1.269***	1.370***
	(0.0330)	(0.0377)	(0.0274)	(0.0443)
Asian	0.979	1.220***	1.615***	1.202***
	(0.0452)	(0.0491)	(0.0461)	(0.0401)
Other	1.102	1.188***	1.055**	0.939*
	(0.0741)	(0.0231)	(0.0221)	(0.0323)
Hispanic	0.759***	0.958*	1.122***	1.037
	(0.0347)	(0.0225)	(0.0395)	(0.0248)
Education (less than H.S. is base)				
Some HS	1.283***	1.268***	0.987	1.085
	(0.0485)	(0.0648)	(0.0432)	(0.0571)
HS degree	1.595***	1.195***	1.052	1.488***
	(0.0626)	(0.0702)	(0.0470)	(0.0762)
Some college	2.044***	1.185***	1.014	1.563***
	(0.0819)	(0.0697)	(0.0450)	(0.0811)
Assoc. degree	2.297***	1.084	1.030	1.730***
	(0.0902)	(0.0666)	(0.0484)	(0.0903)
College deg.	3.171***	0.841***	0.982	1.941***
	(0.133)	(0.0552)	(0.0495)	(0.119)
Graduate deg.	4.034***	0.709***	0.899*	2.075***
	(0.156)	(0.0433)	(0.0494)	(0.128)
Income (<25K is base)				
$25K - $35K	0.939	0.462***	1.404***	1.919***
	(0.0408)	(0.0153)	(0.0361)	(0.0507)
$35K - $50K	1.108*	0.259***	1.433***	3.179***
	(0.0604)	(0.0107)	(0.0585)	(0.102)
$50K - $75K	1.514***	0.134***	1.345***	5.370***
	(0.0977)	(0.00703)	(0.0623)	(0.182)
$75K - $100K	2.191***	0.0697***	1.202***	8.325***
	(0.152)	(0.00396)	(0.0607)	(0.332)

$100K - $150K	3.497***	0.0387***	1.063	12.47***
	(0.233)	(0.00250)	(0.0535)	(0.504)
$150K - $200K	4.979***	0.0259***	1.015	14.97***
	(0.322)	(0.00181)	(0.0478)	(0.607)
>$200,000K	7.213***	0.0165***	1.030	15.07***
	(0.574)	(0.00141)	(0.0454)	(0.846)
# of children (0 is base)				
One	1.276***	2.208***	1.052***	0.990
	(0.0272)	(0.0975)	(0.0104)	(0.00854)
Two	1.446***	3.164***	1.054***	0.920***
	(0.0481)	(0.149)	(0.0122)	(0.0125)
Three	1.424***	4.464***	1.062***	0.768***
	(0.0453)	(0.232)	(0.0174)	(0.0148)
Four	1.491***	6.215***	1.060*	0.636***
	(0.0773)	(0.398)	(0.0359)	(0.0224)
Five	1.300***	8.860***	0.972	0.490***
	(0.0685)	(0.683)	(0.0422)	(0.0180)
Daily # of cases	1.000	1.000	1.000	1.000**
	(5.24e-05)	(4.90e-05)	(2.57e-05)	(3.58e-05)
Daily # of deaths	1.004*	1.002	1.002**	1.000
	(0.00230)	(0.00228)	(0.000970)	(0.00132)
Own job loss (G1)	0.181***	1.797***	1.265***	0.165***
	(0.0130)	(0.121)	(0.0445)	(0.0106)
Family member job loss (G2)	0.420***	1.358***	1.233***	0.475***
	(0.0141)	(0.0658)	(0.0237)	(0.0114)
Expansion*G1	1.217**	1.966***	1.018	0.931
	(0.106)	(0.146)	(0.0513)	(0.0644)
Expansion*G2	1.013	1.363***	1.029	0.943*
	(0.0459)	(0.0712)	(0.0275)	(0.0285)
Constant	15.45***	0.0204***	0.398***	1.285**
	(2.094)	(0.00277)	(0.0395)	(0.137)
Observations	872,428	872,428	872,428	872,428

Note: Estimated odds ratios, standard errors in parentheses; clustered at the state level.
Variables included but not shown, state dummies and round dummies.
*** p<0.01, ** p<0.05, * p<0.1

Table A3: Estimated odds ratios for Mental health outcomes

	(1)	(2)	(3)
VARIABLES	Distress	Anxiety	Depression
Age	1.023***	1.015***	1.023***
	(0.00209)	(0.00197)	(0.00216)
Age squared	1.000***	1.000***	1.000***
	(2.57e-05)	(2.40e-05)	(2.61e-05)
Female	1.333***	1.117***	1.461***
	(0.00919)	(0.00863)	(0.0106)
Married	0.801***	0.756***	0.851***
	(0.00622)	(0.00594)	(0.00596)
Black	0.792***	0.872***	0.757***
	(0.0127)	(0.0136)	(0.0135)
Asian	0.764***	0.882***	0.664***
	(0.0127)	(0.0159)	(0.0107)
Other	1.091***	1.118***	1.070***
	(0.0138)	(0.0136)	(0.0159)
Hispanic	0.919***	0.936***	0.917***
	(0.0199)	(0.0175)	(0.0175)
Education (less than H.S. is base)			
Some HS	0.994	0.998	1.019
	(0.0383)	(0.0338)	(0.0455)
HS degree	0.952	0.945	0.984
	(0.0460)	(0.0427)	(0.0514)
Some college	1.061	1.020	1.122**
	(0.0544)	(0.0485)	(0.0638)
Assoc. degree	0.967	0.922	1.040
	(0.0526)	(0.0467)	(0.0615)
College deg.	0.930	0.826***	1.055
	(0.0518)	(0.0430)	(0.0646)
Graduate deg.	0.942	0.791***	1.125**
	(0.0486)	(0.0381)	(0.0630)
Income (<25K is base)			
$25K - $35K	0.895***	0.898***	0.900***
	(0.0103)	(0.0105)	(0.0108)
$35K - $50K	0.840***	0.833***	0.846***
	(0.0122)	(0.0121)	(0.0134)
$50K - $75K	0.748***	0.733***	0.764***
	(0.0126)	(0.0123)	(0.0137)
$75K - $100K	0.642***	0.622***	0.673***
	(0.0127)	(0.0115)	(0.0132)
$100K - $150K	0.557***	0.533***	0.600***
	(0.0140)	(0.0122)	(0.0141)

$150K - $200K	0.498***	0.466***	0.546***
	(0.0134)	(0.0123)	(0.0144)
>$200,000K	0.428***	0.387***	0.480***
	(0.0118)	(0.0105)	(0.0132)
# of children (0 is base)			
One	0.926***	0.886***	0.980***
	(0.00733)	(0.00897)	(0.00776)
Two	0.869***	0.804***	0.955***
	(0.00861)	(0.00824)	(0.00937)
Three	0.822***	0.762***	0.894***
	(0.0126)	(0.0109)	(0.0142)
Four	0.789***	0.758***	0.844***
	(0.0224)	(0.0201)	(0.0215)
Five	0.788***	0.760***	0.834***
	(0.0282)	(0.0285)	(0.0267)
Daily # of cases	1.000***	1.000***	1.000***
	(4.23e-05)	(4.31e-05)	(4.33e-05)
Daily # of deaths	1.003	1.004***	1.002
	(0.00187)	(0.00155)	(0.00189)
Own job loss (G1)	2.852***	2.816***	2.718***
	(0.0440)	(0.0476)	(0.0358)
Family member job loss (G2)	1.806***	1.755***	1.804***
	(0.0215)	(0.0194)	(0.0190)
Expansion*G1	0.858***	0.857***	0.861***
	(0.0193)	(0.0208)	(0.0190)
Expansion*G2	0.924***	0.917***	0.931***
	(0.0151)	(0.0145)	(0.0145)
Constant	0.350***	0.439***	0.367***
	(0.0269)	(0.0309)	(0.0334)
Observations	872,428	872,428	872,428

Note: Estimated odds ratios, standard errors in parentheses; clustered at the state level. Variables included but not shown, state dummies and round dummies.

*** p<0.01, ** p<0.05, * p<0.1