Minimum Wages, the Earned Income Tax Credit, and Mental Health Around Pregnancy

by

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Abstract:

This study estimates the effects on perinatal mental health of the state's minimum wage and earned income tax credit (EITC), while controlling for other relevant policies and state-level factors. Using data from the Pregnancy Risk Assessment Monitoring System for 2012-2018 births we find robust evidence that minimum wages and EITC levels reduce depression before the pregnancy and that minimum wages reduce postpartum depression. The magnitudes are meaningful; e.g., our estimates suggest that a one dollar increase in the minimum wage (the average change in the sample) reduces pre-pregnancy (postpartum) depression by roughly 10 (4) percent. These findings stand up to standard robustness and falsification tests, including event study analyses, a wide array of alternative specifications, and finding no effect for those unlikely to benefit (e.g., college-educated respondents). In a supplementary analysis using data from the Behavioral Risk Surveillance System, we find that state EITC levels may reduce mental distress during pregnancy. Investigating a broad set of outcomes suggests that reducing financial stress is a primary mechanism, which is plausible given the high rate of labor force participation we find for this group.

Keywords: Mental health, minimum wages, earned income tax credit, perinatal health

JEL: I18, I10, J08

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1. Introduction

Depression is a leading cause of disability worldwide and is associated with increased health care costs (World Health Organization, 2021; Friedrich, 2017; Jayawardana et. al., 2023). For pregnant people and those that have recently given birth in particular, depression can pose destabilizing threats during a susceptible period of time. Both young adults and women are shown to have considerably higher rates of depression than other subgroups (National Institute for Mental Health, 2023). Postpartum depression (PPD) has a prevalence rate of around 13 - 19 percent, depending on the specific measure used, and is even higher for low-income people, making it a common but serious mental illness (O'Hara and McCabe, 2013; Goyal et. al., 2010; Dearing et. al., 2004). Yet, little research exists on the role that anti-poverty policies play on perinatal mental health; this void is especially true for labor market policies despite the high labor force participation of this population. Our study aims to fill that gap.

Policy advocates have highlighted the severity of perinatal depression and called on further government intervention to address the issue (Vericker et. al., 2010; Chester, 2016). Several states have applied to extend public health insurance coverage one-year postpartum, with PPD cited as a major reason to do so (e.g., Boston Globe Editorial Board, 2021). Labor market policies also have the potential to affect access, both via employer-sponsored health insurance and income more generally. Moreover, financial stress may create or exacerbate existing feelings of depression. Research suggests the mental health of young women is particularly harmed during economic downturns (Black et. al., 2022) and that state minimum wages and EITC levels have beneficial mental health impacts, especially for women (Horn, Maclean, and Strain, 2017; Kuroki, 2021; Dow et. al., 2020; Gangopadhyaya et al., 2021). Depression prior to or during

pregnancy is a key risk factor for PPD, suggesting that a comprehensive investigation explores mental health during the entire perinatal period.

To our knowledge, this study provides the first empirical evidence of the effect of minimum wages on mental health during any part of the perinatal period. In addition, it is the first to provide comprehensive evidence of the perinatal effects of state EITC policies. While pregnancy and childbirth may reduce labor market participation, the potential effects of these labor market policies remain strong, both through their partners' work experience as well as their own. We also investigate the effects of two programs that likely target this group specifically, the Temporary Assistance for Needy Families (TANF) and the Medicaid expansions that occurred as part of the Affordable Care Act (ACA).

Using data from the Pregnancy Risk Monitoring System (PRAMS) during a period of widespread changes in these state policies (2012-18), we find robust evidence that state minimum wages improve mental health before and after pregnancy and suggestive evidence that EITCs have positive effects as well. Moreover, the estimated magnitudes are meaningful; e.g., a $1 increase in the minimum wage is estimated to reduce pre-pregnancy depression and PPD by 10 and 4 percentage points, respectively. Our exploration into possible mechanisms such as financial well-being, health insurance status, care utilization, and birth outcomes suggests these improvements are driven by reductions in financial stress. Our findings therefore suggest that labor market policies targeting low-income workers have potentially strong beneficial effects that have to date been overlooked.

The paper proceeds as follows: Section 2 outlines the policy background and relevant previous research. Section 3 details our conceptual framework, while section 4 explains the data and methods used. Results are discussed in section 5 with concluding remarks given in section 6.

2. Background and Previous Work

Depression rates are higher for reproductive age women than the general population (National Institute for Mental Health, 2023). Pregnancy and childbirth seem likely to exacerbate this tendency, both due to physiological changes as well as environmental factors and stress. While the symptoms of postpartum depression are similar to that of major depressive disorder – a persistent lack of hope, interest, energy, and joy for example – it can stem from different origins associated with birth (postpartumdepression.org). Hospitalizations from PPD increased 34 percent from 2005 to 2012, reaching 36.7 hospital visits per 10,000 births in 2012, highlighting the growing danger of the illness (Franca and McManus, 2018). Depression before and during pregnancy can be equally threatening, posing similar symptoms and leading to a higher risk of developing PPD. Evidence further suggests that prenatal depression may be associated with poor infant outcomes, such as preterm birth or low birth weight (Accortt et at., 2015; Conway and Kennedy, 2004).

Experiencing depression as a young adult has been linked to large adverse effects in later life labor market outcomes (Wang et. al. 2023). Postpartum mental illness can have substantial additional spillover effects, including lower quality childcare and child outcomes, a potentially large social cost (Field, 2009; O'Hara and McCabe, 2013; Menta et. el. 2023). Efforts to combat perinatal mental illnesses include psychotherapies and medication, both of which have shown promising results (O'Hara, 2009; American Psychological Association, 2012). While not the primary goal, anti-poverty policies may also combat perinatal depression inasmuch as they improve access to these treatments or reduce the risk factors and stressors. A small but growing literature finds promising mental health benefits of labor market policies, especially for women; however, the perinatal period has been mostly overlooked.

2.1 Minimum Wage and Mental Health

The bulk of economic studies on minimum wages focus primarily on labor market outcomes, finding mixed results for the general population but some evidence of adverse effects for teenagers and those with low education levels (see Neumark and Shirley, 2022 for full review). As we discuss further in Section 3, the effect of the minimum wage on an individual's labor supply and subsequent household income is ambiguous, making the spillover effects to other outcomes hard to predict. More recent work has started to examine the effects on other outcomes, including health (see Leigh, 2021 for full review). While the U.S. federal minimum wage has remained at $7.25 since 2009, the minimum wage imposed by individual states has increased and, in some cases, far exceeds the federal level, leading to ample variation (see Table 1). For example, in the last year of our sample (2018) state minimum wages ranged from the federal minimum wage of $7.25 to $11.50.

Focusing on those studies that consider mental health impacts, previous work suggests a beneficial relationship between minimum wages and mental well-being, especially for women. Horn, Maclean, and Strain (2017) find state minimum wages are associated with decreases in "not good" mental health days among women, but not men, using the Behavioral Risk Factor Surveillance System. Kuroki (2021) extends Horn et. al. (2017) and suggests state minimum wages reduce extreme mental distress, as measured by reporting all of the past 30 days were spent with "not good" mental health. Deaths by suicide have also been shown to decrease with increases in state minimum wages (Dow et al., 2020). Additionally, research has documented improvements in child health (Wehby et. al., 2022), with parental mental health offering a possible avenue for these effects. However, work looking specifically at young adults, 18-25

years old, finds no significant effect in mental health outcomes (Allegretto and Nadler, 2020). Research has also found a reduction in financial stress, such as trouble paying bills, following increases in sub-minimum wages for people who have recently given birth, a potential pathway for mental health improvements (Andrea et al., 2020).

Outside of the U.S., studies examining minimum wages in the U.K. also find a reduction in mental illness, citing stress relief and changes in health behaviors (Lehart, 2017; Reeves et al., 2017). However, a more recent paper found no impact on mental health status (Maxwell et. al., 2022).

2.2 Earned Income Tax Credit and Mental Health

The Earned Income Tax Credit (EITC) is a federal program that provides income subsidies to low-income households. The tax credit is refundable (i.e., tax liability can be negative) and is equal to a specific percentage of earnings that increases with the number of children in the household up to three children. The dollar amount of the credit therefore increases with earnings (the 'phase-in' range) until it reaches a maximum (the so-called 'plateau range'). Beyond a certain level of earnings, the credit is then reduced as earnings increase (the 'phase-out' range). The federal EITC is sizable and reaches a wide range of income levels; for example, in the last year of our analyses, 2018, a family with three children could receive a maximum of $6431 and would be eligible for some amount of credit as long as their household income was less than $54,884. The credit for those without children is substantially smaller than those with children; e.g., the 2018 maximum is $519 for childless households and reaches those with incomes below $20,950.

Many states have EITC programs (see Table 1), structured as an additional fraction of the federal EITC (the EITC multiplier) which in 2018 ranged from 0.03 to 0.37. An additional difference is that not all state EITCs are refundable. These programs therefore clearly target families and so it is likely first-time parents and existing parents are impacted differently. Received as a one-time payment upon filing taxes, the EITC's effects may be heavily concentrated in the spring. Our empirical analysis explores these nuances as well as whether or not the state EITC is refundable.

Many economic studies on the EITC focus primarily on employment related outcomes, with the theoretical effects on labor supply being ambiguous due to the three different ranges of the program. Single parents have been consistently shown to increase their labor supply in response to increases in EITC levels, resulting in a reduction in poverty rates, providing a potential pathway for mental health implications (See Hoynes, 2019 for full review).

A growing literature examines many other outcomes including education, fertility and, of particular interest here, mental health. Two studies show that the federal expansion of the EITC in the early 1990s resulted in improvements in mental health measures and subjective well-being for women (Evans and Garthwaite, 2014; Boyd-Swan et al., 2016). More recent work on state EITC payments confirms these effects and shows they are largely through income and employment effects, rather than changes in insurance status (Gangopadhyaya et al., 2021). State EITC levels are also found to reduce deaths by suicide (Dow et. al., 2020; Lenhart 2019). There is also evidence of long-term improvements to mental health resulting from EITC levels (Yoder 2022). In contrast, Jones et. al. (2022) does not find a statistically significant effect of long term EITC exposure on the mental health status of women at age 50. To our knowledge, the only work that considers the impact of state EITC levels on perinatal health is the limited evidence

provided by Morgan et al (2022), which find small and statistically insignificant reductions in PPD.

2.3 TANF, Medicaid, and Other Policies

Other safety-net policies may affect perinatal mental health as well, the most obvious being TANF and Medicaid. TANF has a direct route to impacting perinatal mental health as it is largely targeted at low-income people with children. While we are aware of no research that focuses on the effects of TANF -- specifically -- on mental health, studies have connected exogenous sources of income to improved mental health overall (Lindahl, 2005). Recent work by Schmidt et al. (2023) finds that higher safety-net levels, measured by a combination of EITC, TANF, and SNAP benefits, can reduce severe psychological distress for single mothers by 5.5 percent per $1,000 in combined benefits. Research has also suggested SNAP benefits alone can improve mental health outcomes for women (Munger, 2016), as can unemployment insurance benefits (Chen et. al., 2023). These studies have not focused on the perinatal period, however.

Medicaid has received attention in terms of perinatal mental health and it, like TANF, EITC and minimum wages, varies across the states. Guldi and Hamersma (2021) find that the 1990's Medicaid expansion for pregnant women improved maternal health outcomes including mental health after the birth. Two studies consider the effects of the ACA Medicaid expansions in the 2010s on perinatal depression and find some evidence of beneficial effects. Margerison et al. (2021) finds that the ACA's Medicaid expansions led to a decrease in depression in the months leading up to pregnancy, as well as an increase in mental well-being postpartum; however, they find no statistically significant relationship with PPD. Austin et. al. (2022) finds a negative but statistically insignificant on PPD as well. While not our main focus, we follow past

work on state minimum wages and EITCs by controlling for state TANF and Medicaid policies in all of our specifications.

2.4 Potential Effects of Labor Market Policies During Pregnancy

To our knowledge, our study is the first to investigate the effects of these two labor market policies on mental health around the time of pregnancy. However, for these policies to have a direct effect, either the person giving birth or a member of their household must be connected to the labor market in some way. Health impacts and additional time demands of pregnancy and childbirth may reduce labor supply and thus limit the possible impact on this group. Because our primary data source, the PRAMS, contains little information on labor market behavior, we turn to other data sources for evidence to explore the likely reach of these policies.

Using the Behavioral Risk Surveillance System (BRFSS) we find that during our sample period of 2012-2018, roughly 65 percent of pregnant people report being employed. Similarly, The American Community Survey (ACS) provides information on the employment of individuals who have given birth in the past year, yielding a measure of employment around the time of pregnancy and birth. Using this measure, we find 68 percent of those who gave birth in the past year were employed at some point in the past year, and 57 percent were employed at the time of interview. Additionally, 94 percent of spouses or partners with a child under one-year-old were employed at some point in the past year, and 90 percent were employed at the time of the interview[1].

[1] Both the BRFSS and ACS include observations from all states and contain sampling weights that we use to construct these statistics. The BRFSS asks 1) if the person is pregnant, and 2) their employment status. The BRFSS does not provide information on how far along the pregnancy is. The ACS contains information on employment in the 12 months prior to the interview and if the person has given birth in the past 12 months.

These statistics therefore suggest that the vast majority of households, including the individuals giving birth, are participating in the labor market in the time before, during or after pregnancy and childbirth. Moreover, to the extent that these policies affect labor market participation their potential impacts reach beyond those currently working. For example, if an increased minimum wage causes the person to become unemployed and thus be observed not working, the policy may still have impact on their mental health -- via their exit from the labor market. Additionally, households with more than one person, such as married couples, seem more likely to be impacted by these policies as they have two potential earners.

3. Conceptual Framework

Our conceptual framework follows the typical health production model (Grossman 1972), in which people maximize utility subject to their budget constraints with mental health as one input into their utility. Current mental health is a function of past mental health, investments in both mental health care and non-mental health care goods, and environmental factors that can impact mental well-being (such as work environment, home life, etc.). Our framework focuses on labor supply/time use and income effects as the two main avenues for the minimum wage and EITC to impact perinatal mental health. Acknowledging that other pathways are possible, including a change in health insurance status and thus a lower cost for health care goods, our empirical investigation into mechanisms explores the effects on health insurance coverage, health care access and other health outcomes, as well as financial well-being.

3.1 Time Usage and Labor Supply

The labor supply effects of these policies on perinatal depression are ambiguous not only because the policy effects on labor supply are ambiguous, as noted above, but also because the effects of labor supply on depression are ambiguous as well. In other words, the effect of EITC and minimum wage on mental health -- $\frac{\partial \text{Mental Health}}{\partial \text{Policy}}$ -- is the product of $\frac{\partial \text{Mental Health}}{\partial \text{Labor Supply}}$ and $\frac{\partial \text{Labor Supply}}{\partial \text{Policy}}$, both of which are theoretically ambiguous.

Beginning with the second term, $\frac{\partial \text{Labor Supply}}{\partial \text{Policy}}$, the EITC provides both incentives and disincentives to increase labor supply depending upon whether the household is in the phase-in, plateau or phase-out range of the credit. Similarly, increasing the minimum wage could lead to a decrease in employment if the individual is the marginal worker who gets laid off or has their hours reduced as a result. Conversely, to the extent that these individuals are now relatively more desirable workers (say, as compared to teenagers), their labor supply could remain constant or even increase. Empirical research suggests parental labor supply increases in response to higher minimum wages (Godøy et. al., 2021).

However, even if $\frac{\partial \text{Labor Supply}}{\partial \text{Policy}}$ was known, the subsequent effects of that change in labor supply – independent from effects of the income generated -- on perinatal depression is ambiguous ($\frac{\partial \text{Mental Health}}{\partial \text{Labor Supply}}$). Because one's home and work environment may affect mental health, working may either improve or degrade mental health depending on those environments. If a newly employed person enjoys the structure and social aspect of working, then we might expect improvements in measures of depression. However, stress from a workplace can also cause or exacerbate mental health issues. The movement to unemployment or reduced hours of work yields a similar story: with additional free time, people may engage in mental health

boosting activities like hobbies or time spent with loved ones (including their young children). Conversely, the stress, stigma, and other aspects associated with unemployment may increase depression (Zuelke et al., 2018). Thus, the impact of these policies on mental health through labor supply effects alone are unknown.

3.2 Income Effects

Applying the same logic, the income effects of these policies are the product of their effects on income, $\frac{\partial \text{Income}}{\partial \text{Policy}}$, and the effects that income have on mental health, $\frac{\partial \text{Mental Health}}{\partial \text{Income}}$. The effect that the minimum wage has on income is ambiguous for the same reasons that its labor supply effects are. In contrast, the EITC seems more likely to increase income ($\frac{\partial \text{Income}}{\partial \text{Policy}} > 0$), as supported by empirical evidence. It seems likely that the effect of income on mental health is also positive ($\frac{\partial \text{Mental Health}}{\partial \text{Income}} > 0$), assuming that mental health is a normal good. Increases in income may also reduce financial stress, which is a known risk factor for depression. Nonetheless, the empirical relationship between income and well-being is far from established, and not all types of observed expenditures are mental health enhancing. Additional money can be spent on goods that improve mental health (mental health care, food, housing), or goods that harm mental health (drugs, alcohol). We therefore conclude that while this second term seems likely positive, its effect ultimately depends on how the marginal dollar is spent.

4. Data and Methodology

We use data from the restricted access Pregnancy Risk Assessment Monitoring System (PRAMS) from 2012 to 2018 births, or phases 7 and 8. The PRAMS is a survey conducted by

the Center for Disease Control typically sent out to people who have given birth within 2 to 4 months, with the goal of collecting data on conception, pregnancy, and birth related health outcomes. The PRAMS is the ideal dataset for investigating the relationship between anti-poverty policies and mental health before and after pregnancy as it contains measures of perinatal depression not available in other datasets and has ample sample size[2]. We limit our sample to those ages 18 to 45 and drop those with extreme values[3]. In our primary analyses, we focus on respondents with less than a 4-year college education because they seem the most likely to be affected by these policies. In robustness checks, we estimate the effects for other groups, including a college-educated group and a less-than-high school group that we expect to be less/more affected.

As the PRAMS is conducted at the state level, some states do not have data in some years. The PRAMS requires a response rate threshold to be met, while others are missing because the state did not conduct the survey which together limits some state year combinations. We use the largest possible sample, which includes 33 states and 182 state-year combinations. We re-estimate our main models using a fully balanced sample with 16 states that include all 7 years of data and find qualitatively similar results[4]. The years and states of our PRAMS analyses are reported in the first two columns of Table 1.

4.1 Changes in the Safety Net

[2] Other options include datasets capturing the general public, not people who have recently given birth in particular, such as the National Institute on Health Survey.
[3] Specifically, those reporting more than ten dependents, or gestation periods less than six months or more than a year.
[4] These results and all other results discussed but not reported are available upon request.

Identifying and isolating the empirical effects of these policies requires substantial independent variation. Table 1 summarizes the years and states covered by the PRAMS data alongside the changes to these four policies and reveals considerable independent variation. Of the 33 states represented in the PRAMS, the minimum wage increased in 18 (often multiple times in a state), the state EITC multiplier increased in 9, and 25 expanded Medicaid eligibility at some point between 2012 and 2018. Figure 1 further depicts these changes and shows the geographic variation. Summary statistics, definitions and sources for the full set of state-level variables and individual characteristics are reported in Appendix Table 1.

4.2 Outcome Variables

The PRAMS provides two measures of depression that differ in timing and construction. The first is the respondent's self-reported depression in the three months prior to pregnancy. As reported in Table 2, pre-pregnancy depression has a prevalence rate of 14.1 percent for those without a 4-year college education. Depression prior to the pregnancy is an important outcome on its own as it measures mental health entering pregnancy. Additionally, it allows us to use a potentially key control when modeling postpartum depression.

The second is a measure of postpartum depression constructed from depressive-related symptoms reported at the time of the interview. Specifically, our PPD variable is captured with a binary measure based on a person's response to two depression-related screening questions, called a PHQ-2. In phase 7 and 8 of the PRAMS these two questions are “Since your new baby was born, how often have you felt down, depressed, or hopeless?” and “Since your new baby was born, how often have you had little interest or little pleasure in doing things you usually enjoyed?”. Each is presented with a five-point scale of answer choices containing: always, often,

sometimes, rarely, and never. The typical threshold to qualify for depression is answering often or always to at least one of these questions. This process is common for PHQ-2 questions aimed at measuring depression in general, aside from postpartum. A binary flag for PPD is provided by the PRAMS, using this same method. Again, prevalence rates for those without a 4-year college degree is around 14 percent. We can also generate a measure of mental well-being from the PHQ-2, a flag for those least likely to have depression, following Margerson et al. (2021). A measure of mental well-being allows us to model those at both ends of the mental health spectrum.

The wording of the PHQ-2 questions is different in phase 6 of the PRAMS[5], which requires us to limit our sample to phases 7 and 8, or 2012-2018 births. Our main two outcome measures are thus 1) self-reported depression in pre-pregnancy, and 2) a PHQ-2 constructed measure for PPD. We caution that these two measures are not directly comparable. This difference likely explains why the prevalence of depression does not appear to increase in the postpartum period and instead remains around 14 percent in both periods.

There is a strong cross prevalence rates showing a high correlation between the two measures of depression. The bottom of Figure 2 shows how strong this correlation is, as the rate of PPD is almost 20 percentage points higher for those reporting depression before the pregnancy. Figure 2 shows prevalence rates for both PRAMS measures of depression based off of different subgroups. Differences across race show potentially important trends. White non-Hispanic respondents are more likely to report pre-pregnancy depression than Black non-Hispanic or Hispanic respondents. However, when looking at PPD Black non-Hispanic respondents have a higher prevalence rate than other groups. This suggest that race may play a

[5] Births prior to 2012.

role for the onset of PPD. To account for this, we report later models stratified by race and ethnicity.

To fill in the gap between the three months prior to pregnancy and the postpartum period, we conduct a supplementary analysis using the BRFSS. While the BRFSS does not identify those who have recently given birth, or ask questions about mental health before the pregnancy, it does identify people who are currently pregnant. Using the BRFSS therefore allows us to fill in the gap between the before conception and time of interview (postpartum) measures available in the PRAMS. The BRFSS measure of mental health is substantially different from the PRAMS, which limits the comparability between the two. However, its common use in resent research on mental health more broadly (e.g. Horn et al., 2017) facilitates comparison with existing work. In a supplemental analysis, we consider impacts to mental health during pregnancy using the BRFSS. The BRFSS asks how many out of the past 30 days has the person had "not good" mental health. We use this question to generate three measures of mental health. Following Horn et. al. (2017), we first use the linear number of days reported. Next, to consider those most likely to have a mental illness or serious mental health issue, we create two binary measures with cut offs at those reporting at least 10 days and those reporting all 30 days, similar to Kuroki (2021). Table 2 shoes that these two cut-offs produce estimates that roughly match the percentage of Americans living with any mental illness and a serious mental illness respectively, which is estimated to be around 20 and 5 percent (National Alliance on Mental Health, 2023).

After investigating the effects of these policies on mental health around pregnancy, we explore possible mechanisms such as health insurance status, health outcomes and economic well-being. The bottom of Table 2 provides summary statistics and definitions for these possible mechanisms.

The PRAMS also contains several characteristics that could be related to depression and the other outcomes, such as respondent's age, marriage status, race and ethnicity, number of people dependent on household income, months between birth and interview, and education attainment. The BRFSS contains these same, or very similar, measures. Finally, we also control for the overall state environment by including the annual average state level unemployment rates, political party of the state governor, and per capita mental health care supply from County Business Patterns data. More information on control variables is reported in appendix table 1.

4.3 Identification Strategy

We estimate, via OLS[6], a generalized difference-in-differences model, shown in equation (1).

$$(1)\ Y_{ist} = \beta_1 MinWage_{st} + \beta_2 EITCMax_{ist} + \beta_3 TANF_{st} + \beta_4 MedExp_{st} + \psi X_{ist} + \theta A_{st} + \delta_s + \tau_t + \varepsilon_{ist}$$

Where Y_{ist} is the outcome considered in each model for individual i in state s in year t. $\beta_1 MinWage_{st}$ is the minimum wage in dollars in the state[7], while $EITCMax_{ist}$ is the EITC amount receivable in their state-year combination for their family size[8], in thousands of dollars. As reported shortly, we also explore alternative forms of these variables, such as using logged or lagged values, the EITC multiplier (instead of dollar value) and the minimum wage relative to

[6] Main results are robust to using probit rather than OLS.
[7] Unless the state's minimum wage is below the federal level, in which case we use the federal amount.
[8] Family size is determined using a measure of people dependent on household income at the time of the survey. We believe this is the best available measure, as the PRAMS does not consistently provide information on the number of children in the household.

the state-year median wage[9]. $TANF_{st}$ is defined similarly to the EITC and is the maximum amount a family of 3 is eligible for in state s and year t. $MedExp_{st}$ is a dummy variable for if state s expanded Medicaid under the ACA at least 9 months before the respondent gave birth.

State and year fixed effects are included with δ_s and τ_t, while state and individual level controls are shown with A_{st} and X_{ist}. State controls include the political party of the state's governor, the state's unemployment rate in year t, and a measure of mental health care supply from the County Business Patterns. Individual level controls include month of conception or interview fixed effects (in line with the outcome), race, ethnicity, age, age squared, marital status, education, and time between birth and interview. Standard errors are clustered at the state level (Bertrand et al., 2004).

We limit our main analysis to those without a 4-year college education, defined as less than 16 years of schooling, to focus on the group of people most likely to be impacted by these anti-poverty policies. We conduct several event study analyses to verify that these models satisfy the pre-trend assumption and also to investigate the dynamic effects -- i.e., whether the effects grow, diminish or are roughly constant as time passes. In addition to the complication of having multiple policies to investigate, these analyses must also be adapted because minimum wages and EITC 1) are continuous, and 2) change multiple times in some states during our sample period. To address these complications, we follow the empirical approach of Schmidheiny and Siegloch (2019) and conduct analyses both for each policy separately (controlling for the others) and then jointly[10].

[9] We further explore if the effect of EITC differs when it is refundable and find no evidence of any differences. Likewise, we test if the EITC impact varies by time of year in accordance with when EITC payments are received and find no evidence. These results, and all others discussed and not reported, are available upon request.

[10] The Schmidheiny and Siegloch (2019) event study distributes lags and leads values for changes in independent variables. For example, a $0.50 increase in the minimum wage in year t would be considered a value of 0.5 for time

5. Results

Both pre-pregnancy and postpartum depression results are summarized in the following sections. Next, we explore various robustness checks and conduct a supplemental analysis for mental health during pregnancy. We conclude the results section with a discussion of possible mechanisms.

5.1 Pre-pregnancy Depression

Table 3 reports pre-pregnancy depression results, using equation (1) and first including each policy separately and then including all at once. Our results suggest minimum wages and EITC levels are each associated with a reduction in depression before the pregnancy whether or not the other policies are controlled for. In contrast, neither TANF nor Medicaid expansion is found to have an effect. Medicaid expansions approach statistical significance when no other policies are considered, echoing the findings of Margerinson et. al. (2021), but those effects are completely eliminated in the full model[11].

These results suggest a one dollar increase in the minimum wage – about the average increase during our sample -- is associated with a 1.55 percentage point decrease in the likelihood of reporting being depressed in the months before the pregnancy. With an average prevalence of 14 percent in our sample, this reduction represents a more than 10 percent decrease

zero during year t, for t-1 in year t-1, t+1 during t+1 and so on. It also allowed for multiple changes within the sample period. See Schmidheiny and Siegloch 2019 for more details on the event study make up.

[11] Margerinson et al. (2021) does not control for EITC, minimum wage, or TANF levels. Our results therefore suggest that including labor market policies may prove important to estimating the impact of Medicaid expansion on mental health outcomes.

in pre-pregnancy depression. Similarly, a thousand dollar increase in the annual maximum EITC amount receivable is associated with a roughly 1.84 percentage point decrease in the likelihood of reporting being depressed in the months before the pregnancy. Back of the envelope comparisons suggest these two effects are similar in size for a part time minimum wage employee[12].

To verify the validity of these estimates, we perform event study analyses following Schmidheiny and Siegloch (2019) that are summarized for minimum wages and EITC levels in Figure 3a and 3b, respectively. For both policies, the pre-treatment estimates are centered around and not statistically different from zero, suggesting that the parallel pre-trends assumption is not violated. In unreported analyses, we find similar results from an event study that analyzes the pre-trends and dynamic effects of both policies at the same time. Besides satisfying the pre-trends assumption, these figures also reveal that the effects of each policy are fairly stable in the years following the change. That is, the estimated coefficients for policies occurring 1, 2 or 3+ years in the past are of similar magnitudes and not statistically different from one another. These findings lend support to our primary specification and suggests that concerns raised by Goodman-Bacon (2019) and others are less of an issue here.

We also conduct a traditional event study for the Medicaid expansion policy to explore if our (lack of) findings are due to a violation of the pre-trends assumptions or dynamic effects. That analysis suggests a downward trend in the effect even before the expansion and so violates the parallel pre-trends assumption. However, such a downward trend should bias our results

[12] Specifically, the estimated effects of the increased income from an additional $1000 in EITC is roughly equivalent to that of a one dollar increase in the hourly wage for those working (1.84/1.55)*1000 = 1200 hours. Put differently, the 1.55 refers to the effect of a $1 increase in the hourly wage, suggesting that the resulting $1000 increase in wage income from someone working 1000 hours is a little less than the 1.84 effect of the $1000 increase in maximum EITC received.

towards finding a negative (beneficial) impact of Medicaid on pre-pregnancy depression and so therefore does not seem likely responsible for the lack of effect we find.

Next, we subject our findings to several robustness checks and additional exercises, summarized in Table 4. We report the results for only the minimum wage and EITC coefficients because the Medicaid and TANF coefficients continue to be statistically insignificant and are not the focal point of this study. The first column in the top panel repeats the results for our main model (column 4 in table 3) for comparison. Our first exercise addresses the concern that by including the unemployment rate as a control we are potentially shutting down a possible avenue for these policies to have an effect. For example, an increase in the minimum wage may lead to increased unemployment, but this effect would instead be captured by the state unemployment variable. However, the second column in the first panel shows that dropping the unemployment rate from the model has a negligible impact on the estimated effects.

The rest of this panel reports the estimated effects for different education groups, including those more and less likely to be affected. Those with less than a high school education have substantially larger effects, while those with a college education show no effect. These findings therefore lend support to a causal interpretation. Additionally, married households have at least two potential earners and thus may be expected to be more strongly affected by labor market policies than unmarried households. While the point estimates are fairly similar, the lower incidence of pre-pregnancy depression among this group suggests a substantially larger proportional impact of the EITC while the minimum wage's effect is similar[13].

[13] As shown in Figure 1.2, the incidence of pre-pregnancy depression is 11.4 percent for married people compared to 14.1 percent for the entire main sample. The estimated 2.1 percentage point decline due to the EITC is thus a 2.1/11.4 = 18.4 percent decrease compared to a 13 percent decrease for the entire main sample.

The second panel explores stratifying the sample by parity and race/ethnicity. EITC payments are much larger for households with a child, which our specification takes account of by including the maximum amount for that specific household. However, it is important to confirm that first time parents are not driving our results, as their pre-birth EITC payments are substantially lower than those with previous children. While our estimated impact of EITC levels on pre-pregnancy depression for those with a previous birth is not precise, it is a similar magnitude to the impact of the main sample. Additionally, estimates for those without previous children are close to zero[14].

The rest of the second panel shows that while the estimated effects of these policies are negative for all racial/ethnic groups, minimum wages have the strongest effects for White non-Hispanic and Hispanic respondents and EITC has the strongest effects for Black non-Hispanic and Hispanic respondents. The lower incidence of pre-pregnancy depression among Hispanic respondents (as shown in Figure 2) suggests that these labor market policies may have an especially powerful effect for this group.

The last panel in Table 4 explores alternative measures of both policies that are frequently used in past work. We first limit our sample to respondents ages 18 to 25, as previous work has argued this is the age group most likely to be impacted by the minimum wage. Our findings for both policies remain when examining this age group, which has a slightly larger prevalence rate. We next try using lagged and then logged measures of both minimum wages and EITC levels. Several EITC studies use the state EITC multiplier instead of the dollar amount (which we can tailor to the household's composition), and so we try using it instead. Finally, wage levels vary a great deal across the states and so the potential workers affected by a $10

[14] Likewise, in unreported results with the ETIC multiplier the estimated impact is roughly nine times larger for those with a previous birth than those without.

minimum wage, for example, may differ. We therefore also try redefining the minimum wage to be relative to the state's median wage in that year to capture these differences. All of these exercises yield negative and statistically significant effects of similar magnitudes[15], suggesting results are robust to policy specifications.

5.2 Postpartum Depression

We follow a similar approach and use the same model, with variables adjusted for the different timing of the outcome, in our empirical investigation of postpartum depression. Given the much higher prevalence of PPD for those with pre-pregnancy depression, our main estimates may be capturing the indirect effects on pre-pregnancy depression as well, a possibility we explore shortly. Table 5 follows Table 3's format of considering each policy separately and then when all are included.

The estimates of minimum wages and EITC are again similar in magnitude but are diminished in size compared to pre-pregnancy; in addition, only the minimum wage has a statistically significant effect. Our main sample results suggest a one dollar increase in the minimum wage is associated with a 0.6 percentage point decline in postpartum depression, about 40 percent of the effect of depression before the pregnancy. This smaller magnitude makes intuitive sense as postpartum depression is associated with more biological changes that may be less influenced by income. Surprisingly, the estimate for TANF is both positive and statistically significant when all policies are included. While this result is puzzling, removing TANF as a control does not change our main results for minimum wages and EITC levels. Additionally, modeling TANF as the maximum amount a family can receive given their number of

[15] The EITC multiplier and relative minimum wage specifications are proportional values and therefore would be expected to yield much larger values of a similar size to the log specification.

dependents, as we do for EITC, removes this surprising finding and instead yields a null effect. The effect is also sensitive to the robustness checks performed and reported in Table 6.

As we did with pre-pregnancy depression, we next conduct event studies to explore the parallel pre-trends assumption and possible dynamic effects, reported in Figures 4a and 4b. We once again find no evidence that the parallel pre-trends assumption is violated; i.e., the effects prior to the policy are close to zero and statistically insignificant. For the minimum wage, we find the point estimates are strikingly similar in the years following the increase despite their imprecision, which again supports our primary specification. In line with the weak effects found for the EITC in Table 5, the estimated dynamic effects show much less stability. In the unreported event studies for Medicaid expansion, no coefficients are statistically different than zero, suggesting the pre-trends requirement is satisfied and we do not find evidence for dynamic effects.

Table 6 similarly reports results for different samples and model specifications. In panel one, we again drop the state unemployment rate as a control and then consider those with different levels of education[16]. Dropping the state unemployment rate once again has a negligible effect, alleviating any concern that our main model shuts down possible adverse effects of minimum wage increases. Likewise, estimating the effects for different education groups once again shows the strongest impact for the least educated, as expected. The effects of minimum wages now seem appear stronger for married respondents, especially in terms of proportional impact since the incidence of PPD is substantially lower for married people (Figure 2). It makes sense that minimum wages exert an even stronger effect on married people in the postpartum

[16] While we do not report TANF results in table 1.6, we note that the estimate is positive and statistically significant for the main sample, White non-Hispanic respondents, when controlling for pre-pregnancy depression, and conditioning on not having pre-pregnancy depression.

period given the decreased labor force participation of those who recently gave birth. That is, the effects via the partner's labor supply grows in importance. In the second panel, impacts by family parity and race/ethnicity are explored. Results suggest those with a previous birth are driving the minimum wage impacts. In contrast to pre-pregnancy results, the stronger effects previously found for Hispanic respondents are completely eliminated here. In unreported results, we also again verify that these results are not sensitive to how minimum wages and EITC are measured.

The bottom panel explores alternative specifications. The first column of the bottom panel reports results for respondents age 18-25, as in table 4. While the magnitude of the effect for minimum wage is larger for this subsample, it fails to reach statistical significance. Because the sample is reduced by nearly two thirds with this exercise, there is less statistical power expected.

Next, we explore alternative specifications that control for pre-pregnancy depression. Pre-pregnancy depression is likely endogenous and so these models that include or stratify by it should be viewed with caution. (Recall that PPD is measured differently, which precludes modeling the change in depression status.) Including pre-pregnancy depression as a control diminishes but does not eliminate the statistically significant effect of the minimum wage, suggesting that reduced pre-pregnancy depression is not the primary mechanism. Splitting the sample into those who do versus do not report pre-pregnancy depression suggests that the results are driven by those without prior depression. However, the much smaller sample size for those reporting depression, along with the aforementioned endogeneity, cautions against drawing a conclusion.

Lastly, we consider a different measure of postpartum mental health. Rather than model the probability of an observation showing strong signs of postpartum depression, we consider

those without any sign. To examine the other end of the depression spectrum, we follow Margerison et al. (2021) by creating a dummy variable for those that answer “never” or “rarely” to both questions of the PHQ-2. Put differently, the PPD measure flags those most likely to have postpartum depression while the well-being measure flags the least likely. The last column of the third panel of table 1.6 shows results for postpartum well-being. Much like postpartum depression, we find higher minimum wages lead to improved mental well-being in the postpartum period. The postpartum depression and well-being results together imply that the minimum wage appears to help decrease depression for those showing the strongest signs as well as increase the likelihood of someone showing minimal signs. However, preliminary further investigations suggest the findings for postpartum wellness may not hold up to robust examination[17].

5.3 Supplemental Analysis of Mental Health During Pregnancy

Our main analysis investigates depression before pregnancy and after birth using the PRAMS. To fill the gap in between the two -- mental health during pregnancy -- we use a measure of mental health during pregnancy from the BRFSS. We investigate the number of days a person reports having "not good" mental health out of the past 30 days, and as discussed in section 4.2, the likelihood of reporting 10 or more days or all 30 days. We use 2012-18 data from all available states for respondents reporting they are pregnant at the time of the survey. We attempt to match our PRAMS models as closely as possible, including the same state policy and control variables, the same individual characteristics and year, state and month fixed effects.

[17] Event study models for postpartum wellness suggest the parallel pre-trends assumption may be violated. Additional investigation into these findings is needed but beyond the scope of this study.

Results using these three measures are summarized in Table 7 for two sets of models -- 1) including each policy individually, and 2) including all policies -- similar to Tables 3 and 5. For each of the three measures we model, the EITC maximum amount reduces the frequency of not good mental health days. While the BRFSS mental health measure is different from the PRAMS measures, the marginal impact of an additional 1,000 dollars in maximum EITC payments has a comparable effect relative to the mean compared to pre-pregnancy depression results[18]. However, none of the other policies, including the minimum wage, have a consistently statistically significant effect. The diminished effect of minimum wages seems likely due to the different time period (during pregnancy), the different mental health measure used or the vastly smaller sample size. Nonetheless, these supplementary analyses lend additional evidence for the potential effects of labor market policies on perinatal mental health.

5.4 Mechanisms

We now turn our attention to possible mechanisms through which the minimum wage and EITC can improve mental health during the time around pregnancy. We focus on four different possible pathways: financial stress, insurance status, health care received, and birth outcomes (recall Table 2).

For financial stress we make use of "stressors" questions asked by the PRAMS and utilized by previous research on minimum wages (Andrea et al., 2020). The first is if the respondent "had problems paying the rent, mortgage, or other bills" in the 12 months leading up to birth. The second asks if the respondent or their partner lost their job or had a cut in hours or

[18] Pre-pregnancy results suggest a 1,000 dollar increase in the maximum EITC payments is associated with a 13 percent decline in depression as where during pregnancy results suggest a 16 percent decline in reporting not good mental health all of the past 30 days.

pay in the same time period. In conjunction with one another, these two measures give us insight into the financial stability and stressors in the past year, a potential key mechanism in reducing depression.

Results for these outcomes, stratified by different education levels, are reported in Table 8. We find some evidence that minimum wages reduced problems paying bills in the 12 months before the birth for those with the lowest level of education. As a falsification test, it is reassuring to find no effect on those with a college education. No other policy, including the EITC, has a significant impact although Medicaid is suggestive for the lowest educated. Moreover, the fact that none of these policies, especially the minimum wage, is associated with job loss or reduced pay/hours reinforces our earlier analyses that suggest the adverse employment effects were small (i.e., dropping the state unemployment rate had no effect). More generally, finding either a null or negative effect is consistent with reduced financial distress, since an increased minimum wage or EITC payment combined with no reduction in work or pay translates into increased household income. These results are suggestive of decreased financial stress or improved financial situations possibly playing a role in the decline in depression we find in previous models.

Ideally, we would have measures for mental health treatment received, as this may be a strong possible pathway. However, no measures exist in the PRAMS that is asked in a wide number of states, which precludes such an analysis. Instead, we investigate available but less direct measures, such as health insurance and other health care utilization. It is also possible that perinatal depression, especially PPD, could be affected by birth outcomes -- which in turn could be affected by safety net policies. We also investigate possible impacts on pregnancy intention

because the decision to become or remain pregnant is another possible avenue for these policies to affect perinatal mental health.

Table 9 summarizes the results for these other mechanisms. The first column reveals that the EITC is associated with a reduced likelihood of the pregnancy being planned. This finding is consistent with at least two possible scenarios: 1) a generous EITC discourages planned fertility, perhaps in part because of the greater returns to working (especially among those already with children), and/or 2) people are more likely to proceed with an unplanned pregnancy. In either case, a higher EITC suggests a greater proportion of unintended pregnancies -- which seems likely to lead to poorer mental health postpartum. The extent to which the policy changes the composition of pregnancies observed therefore works against finding a beneficial effect of EITC on postpartum mental health and could explain the weaker results we find there.

The estimated effects of EITC on health insurance before, during and after pregnancy also hint at some negative selection as it is associated with a higher likelihood of being uninsured, especially before pregnancy. The effect of the minimum wage on being uninsured is either negative or statistically insignificant, lending weak support, at best, to health insurance as a mechanism. It is reassuring to see the negative and often statistically significant effects of the Medicaid expansions, with the largest effects before the pregnancy -- the time when the income limits increased. This finding is in line with past work that consistently finds that the ACA Medicaid expansions did indeed expand health insurance coverage. The bottom panel revealed that neither Medicaid nor the other policies considered have a beneficial effect on health care access likely to affect PPD. However, we do find EITC levels to have a beneficial effect on birth weight, a result also found by Hoynes et al. 2015.

6. Discussion

This research offers new evidence on the effects of a range of labor market and safety-net policies on mental health during a particularly impactful time -- before, during and after pregnancy. While a growing body of research suggests that minimum wages and the EITC have beneficial mental health effects on the broader population, our study is the first to our knowledge to focus on the period around pregnancy. We also consider more commonly studied policies targeting this group, namely the ACA Medicaid expansions and TANF.

Our primary analyses using the PRAMS provide robust evidence that minimum wages substantially reduce depression both before pregnancy and during the postpartum period. Our baseline estimates imply that a one dollar increase in the minimum wage led to 10 and 4 percent reductions in pre-pregnancy and postpartum depression, respectively, for those without a 4-year college education. These estimates are within the general range suggested by past research for different interventions and samples (Schmidt et al., 2023, Horn et al., 2017). Some segments of the population experience even larger effects, such as less educated groups, married households, and Hispanic respondents. The main mechanism appears to be through the reduction of financial stress.

The evidence for the EITC is less clear, but still promising. Its estimated effects on pre-pregnancy depression are similar to the minimum wage in its size, statistical significance and robustness. Supplementary evidence from the BRFSS suggests the EITC also improves mental health during pregnancy. However, while it again mirrors the minimum wage in the postpartum period, it fails to rise to statistical significance. The story is also less clear when it comes to possible mechanisms.

Our study therefore suggests that labor market policies are a promising approach to improving mental health before, during and after pregnancy, but several questions remain. Future research is needed to understand how these policies affect the labor market and overall experience of these vulnerable households. Why these policies appear to affect different racial/ethnic groups and whether and how minimum wages and the EITC might work in tandem is not known. Finally, the Covid-19 pandemic has likely changed the mental health landscape and the labor market environment, which suggest research in this area should be updated and extended as post-Covid data become available.

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Figures and Tables

Figure 1. Changes in State Minimum Wages and EITC Multiplier, 2012-2018

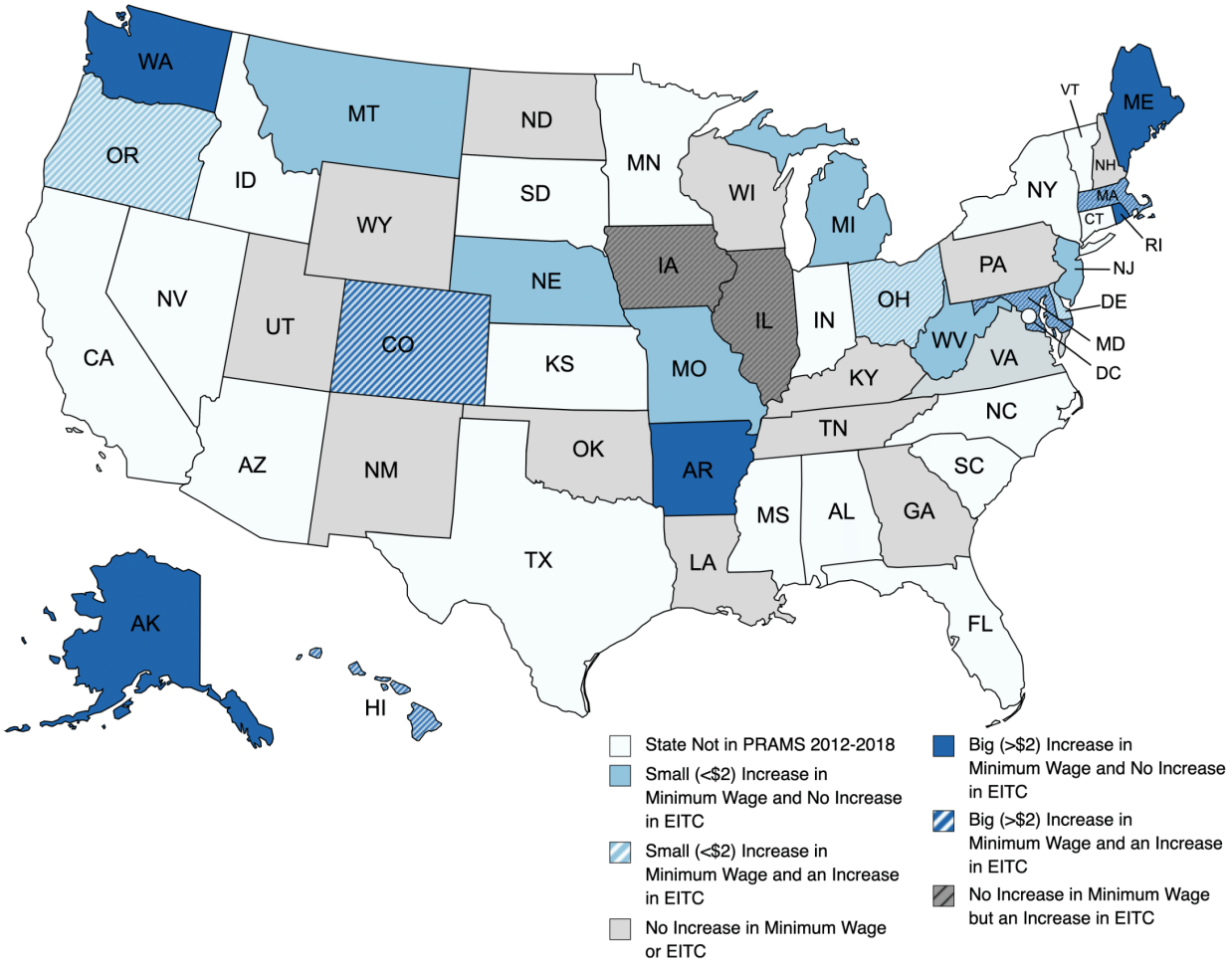
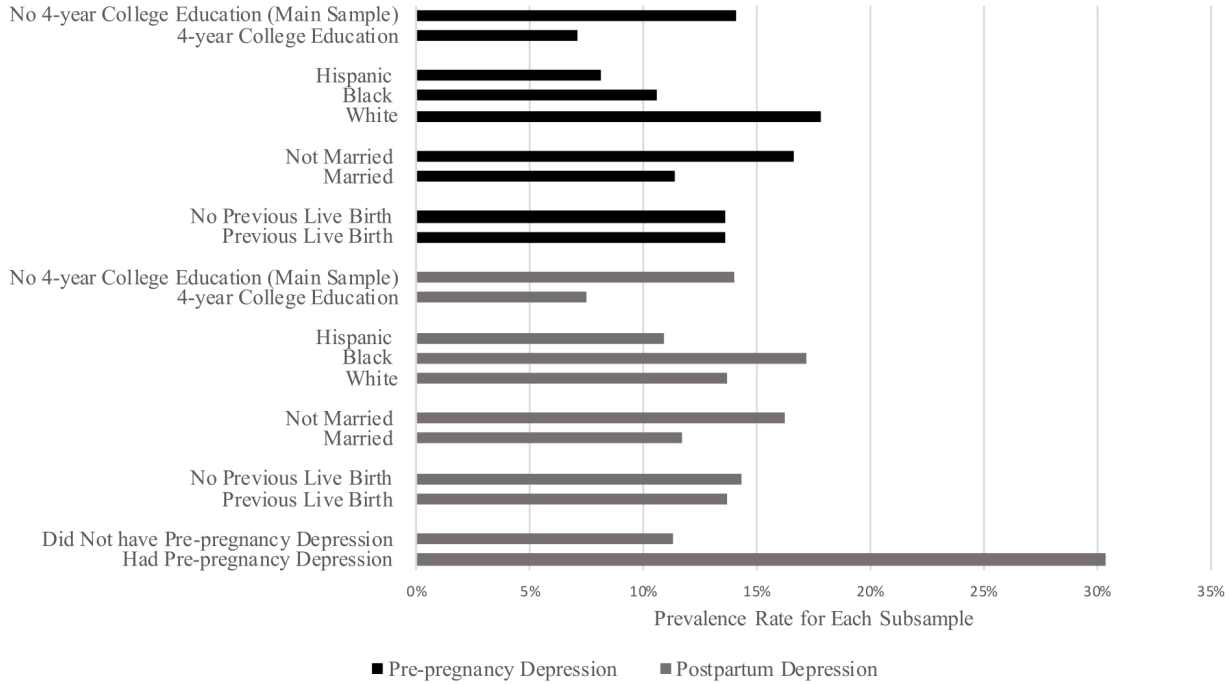
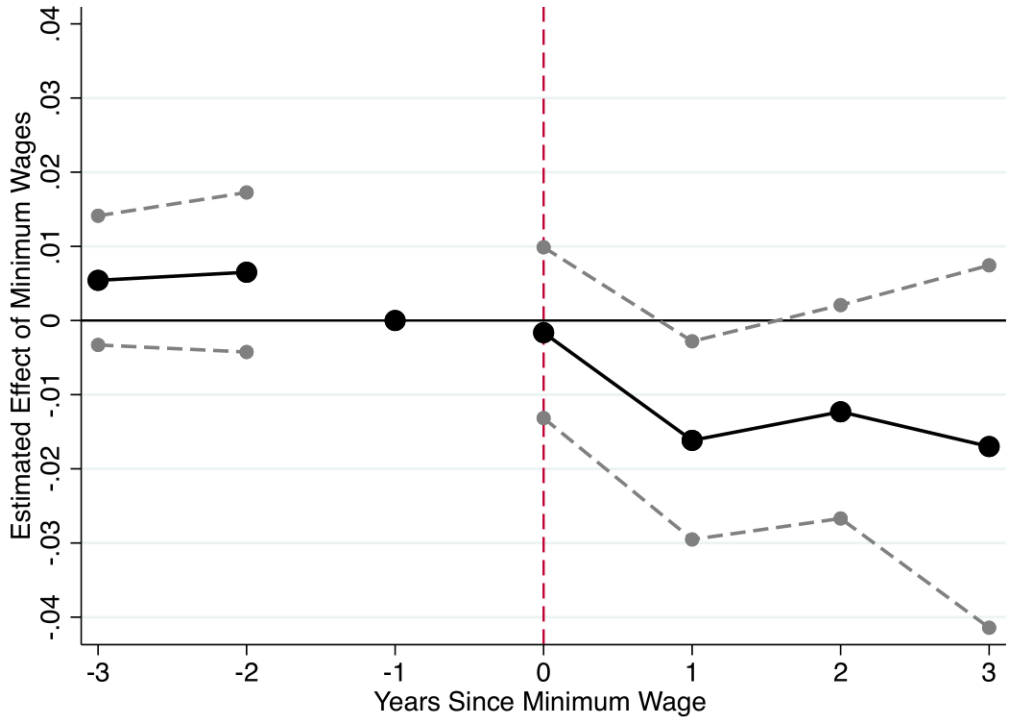


Figure 2. Prevalence Rates for Measures of Pre-pregnancy and Postpartum Depression by Subgroup



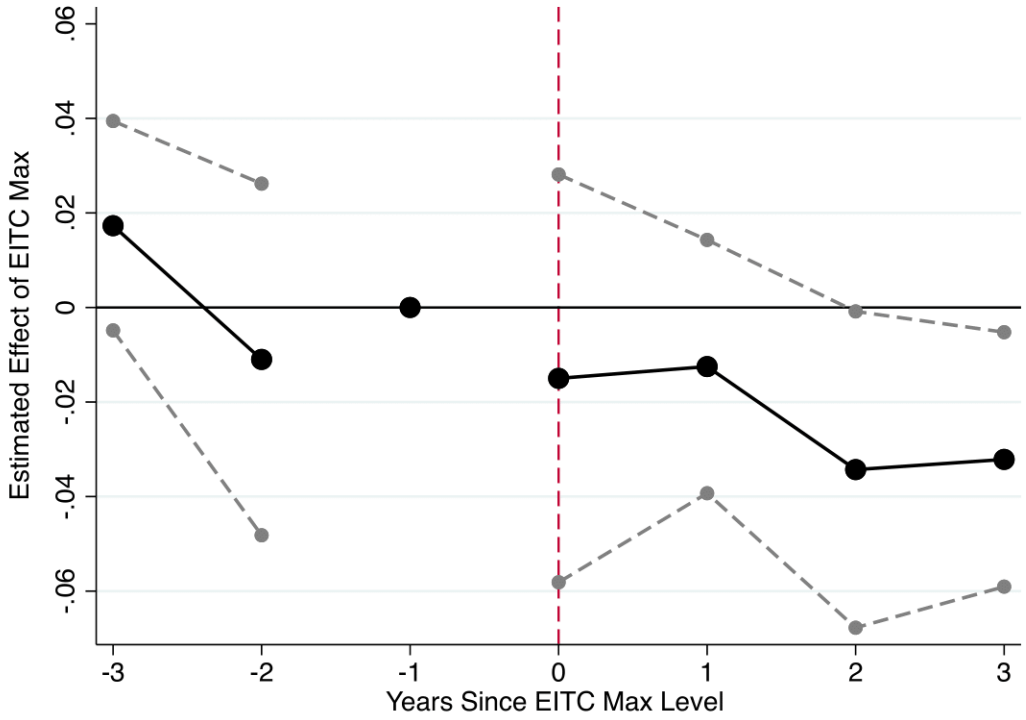
All rates are weighted using sampling weights using the PRAMS with 2012-2018 births. All subgroups are for respondents without a 4-year college education unless otherwise stated. Pre-pregnancy depression is self-reported while postpartum depression is via a PHQ-2. See table 2 for more details on measures.

Figure 3a. Event Study for Changes in Minimum Wages on Pre-pregnancy Depression for Main Sample Using PRAMS Data for 2012-2018 Births



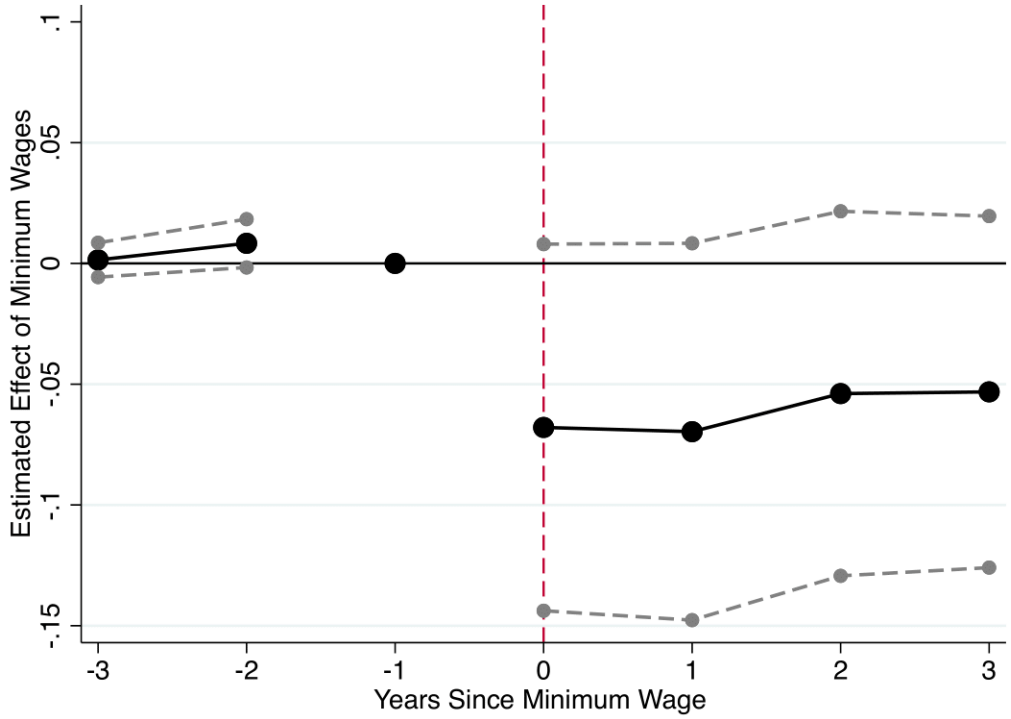
Event study model follows Schmidheiny and Siegloch 2019 for minimum wages while controlling for EITC Max levels, state and year fixed effects, month of conception fixed effects, survey phase, respondent's race, ethnicity, age, education, marital status, time between birth and interview, state mental health care supply, state unemployment rate, and political party of state governor. The gray dashed lines are the 95 percent confidence intervals. All observations are weighted using sample weights and standard errors are clustered at the state level using data from the PRAMS with 2012-2018 births. Policy variables are for year of conception.

Figure 3b. Event Study for Changes in EITC Max on Pre-pregnancy Depression for Main Sample Using PRAMS Data for 2012-2018 Births



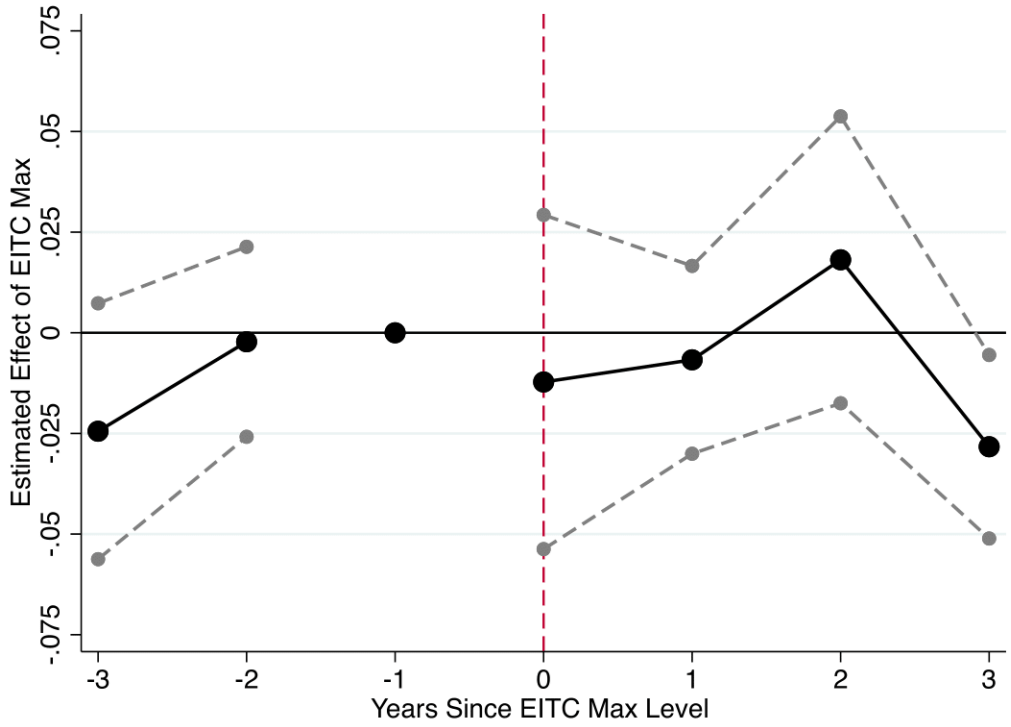
Event study model follows Schmidheiny and Siegloch 2019 for EITC Max levels while controlling for minimum wages, state and year fixed effects, month of conception fixed effects, survey phase, respondent's race, ethnicity, age, education, marital status, time between birth and interview, state mental health care supply, state unemployment rate, and political party of state governor. The gray dashed lines are the 95 percent confidence intervals. All observations are weighted using sample weights and standard errors are clustered at the state level using data from the PRAMS with 2012-2018 births. Policy variables are for year of conception.

Figure 4a. Event Study for Changes in Minimum Wages on Postpartum Depression for Main Sample Using PRAMS Data for 2012-2018 Births



Event study model follows Schmidheiny and Siegloch 2019 for minimum wages while controlling for EITC Max levels, state and year fixed effects, month of interview fixed effects, respondent's race, ethnicity, age, education, marital status, time between birth and interview, state mental health care supply, state unemployment rate, and political party of state governor. The gray dashed lines are the 95 percent confidence intervals and follow the corresponding point estimate in black solid lines. All observations are weighted using sample weights and standard errors are clustered at the state level. Policy variables are for year of birth.

Figure 4b. Event Study for Changes in EITC Max on Postpartum Depression for Main Sample Using PRAMS Data for 2012-2018 Births



Event study model follows Schmidheiny and Siegloch 2019 for EITC Max levels while controlling for minimum wages, state and year fixed effects, month of interview fixed effects, respondent's race, ethnicity, age, education, marital status, time between birth and interview, state mental health care supply, state unemployment rate, and political party of state governor. The gray dashed lines are the 95 percent confidence intervals and follow the corresponding point estimate in black solid lines. All observations are weighted using sample weights and standard errors are clustered at the state level. Policy variables are for year of birth.

Table 1. Summary of State Availability and Policy Variation

States	Years in PRAMS	Change in Min Wage	Change in EITC Multiplier
AK	2012-2018	$2.09	
AR	2012-13, 2015-16	$2.25	
CO	2012-13, 2015-18	$2.56	0.10
DE	2012-2018	$1.00	a
GA	2012-13, 2017-18		
HI	2012-2016	$2.85	0.20
IL	2012-2018		0.13
IA	2012-2017		0.08
KY	2017-2018		
LA	2015-2018		a
ME	2012-2018	$2.50	a
MD	2012-2017	$2.85	0.03
MA	2012-2018	$3.00	0.08
MI	2012-13, 2015-18	$1.85	a
MO	2012-2018	$0.60	
MT	2017	$0.65	
NE	2012-2018	$1.75	a
NH	2013-2017		
NJ	2012-2018	$1.35	0.17
NM	2012-2018		a
ND	2017-2018		
OH	2012, 2014-15	$0.60	0.1
OK	2012-2017		
OR	2012-13, 2015	$1.95	0.02
PA	2012-2018		
RI	2012-2018	$2.70	a
TN	2012-2015		
UT	2012-2018		
VA	2015-2018		a
WA	2012-2018	$2.46	
WV	2012-2018	$1.50	
WI	2012-2018		a
WY	2012-2018		
Average Change		$1.05	0.03
Average in 2018		$8.50	0.08

Max in 2018	$11.50	0.37

States with a minimum wage below the federal level are considered to have the federal level of $7.25. Superscript a denotes states with an EITC multiplier but did not change the multiplier level during our sample period.

Table 2. Summary Statistics of Respondents Without a 4-year College Education

	Mean (std.)	Definition
PRAMS Mental Health Measures		
Pre-pregnancy Depression	0.141	Equal to one if respondent checked "Depression" to "During the 3 months before you got pregnant with your new baby, did you have any of the following health conditions?" for phase 8 or "Before you got pregnant with your new baby, did a doctor, nurse, or any other health care worker tell you that you had any of the following health conditions" for phase 7.
	(0.348)	
Postpartum Depression	0.140	Equal to one if respondent answered "Always" or "Often" to either of "Since your new baby was born, how often have you felt down, depressed, or hopeless?" and "Since your new baby was born, how often have you had little interest or little pleasure in doing things you usually enjoyed?
	(0.347)	
Postpartum Well-being	0.599	Equal to one if respondent answered "Never" or "Rarely" for both of "Since your new baby was born, how often have you felt down, depressed, or hopeless?" and "Since your new baby was born, how often have you had little interest or little pleasure in doing things you usually enjoyed?"
	(0.490)	
BRFSS Mental Health Measure During Pregnancy		
Number of Days with "Not Good" Mental Health	4.976	Persons response to "Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?"
	(11.80)	
10 or More "Not Good" Mental Health Day	0.163	Equal to one if number of days with "Not Good" mental health out of past 30 days is 10 or more.
	(0.370)	
All 30 "Not Good" Mental Health Day	0.059	Equal to one if number of days with "Not Good" mental health out of past 30 days is 30.
	(0.235)	
PRAMS Possible Mechanisms		
Problems Paying Bills	0.236	Equal to one if respondent answered "Yes" to this happening in the past 12 months: "You had problems paying the rent, mortgage, or other bills."
	(0.425)	
Lost Job, Hours, or Pay	0.321	Equal to one if respondent answered "Yes" to any of the following happening in the past 12 months: "My husband or partner lost his job", "I lost my job even though I wanted to go on working", and "My husband, partner, or I had a cut in work hours or pay" as questions.
	(0.467)	
Uninsurance	0.212	Equal to one if respondent answered, "I did not have any health insurance during the month before I got pregnant" to "During the month before you got pregnant with your new baby, what kind of health insurance did you have?". Similar questions exist for during the pregnancy and at the date of interview.
	(0.409)	
Planned Pregnancy	0.436	Equal to one if respondent answered "Yes" to "When you got pregnant with your new baby, were you trying to get pregnant?"
	(0.496)	
Preterm Birth	0.108	Equal to one if respondent reported a gestation period of less than 259 days.
	(0.311)	
Low Birth Weight	0.072	Equal to one if baby was born at less than 2375 grams (necessitated by measure being in 250-gram brackets).

	(0.259)	
Postpartum Checkup	0.879	Equal to one if respondent answered "yes"" to "Since your new baby was born, have you had a postpartum checkup for yourself?"
	(0.326)	
Talked to HCW about PPD	0.760	Equal to one if respondent answered "Yes" to "Postpartum Depression" when asked "Since your new baby was born, did a doctor, nurse, or other health care worker talk with you about any of the things listed below?:"
	(0.427)	

Table 3. Marginal Effects of Safety-Net Policies on Pre-pregnancy Depression

	Min Wage Only	EITC Only	TANF Only	Med Exp Only	All Included
Min Wage	-0.0166***				-0.0155***
	(0.0052)				(0.0049)
EITC Max		-0.0200***			-0.0184**
		(0.0070)			(0.0070)
TANF			-0.0975		-0.0602
			(0.1170)		(0.1044)
Med Exp				-0.0095	0.0002
				(0.0066)	(0.0058)
N	101,045	101,045	101,045	101,045	101,045
Sample Mean	0.141	0.141	0.141	0.141	0.141

All models control for state and year fixed effects, month of conception fixed effects, respondent's race, ethnicity, age, education, marital status, time between birth and interview, survey phase, state mental health care supply, state unemployment rate, and political party of state governor. All observations are weighted using sample weights and standard errors clustered at the state level are in parenthesis. Policy variables are for year of conception. EITC Max and TANF are in thousands of dollars. All models are for observations without a 4-year college education using PRAMS data for 2012-2018 births. *** p<$0.01, ** p<$0.05, * p<$0.1.

Table 4. Alternative Samples and Specifications for Pre-pregnancy Depression

	Main Sample	Drop Unemp Rate	College Plus	Less than HS	Married
Min Wage	-0.0155***	-0.0154***	-0.0000	-0.0223**	-0.0111***
	(0.0049)	(0.0049)	(0.0032)	(0.0085)	(0.0050)
EITC Max	-0.0184**	-0.0184***	0.0081	-0.0443*	-0.0210**
	(0.0070)	(0.066)	(0.0064)	(0.0259)	(0.0079)
N	108,260	108,260	55,615	19,273	48,962
Sample Mean	0.141	0.141	0.071	0.153	0.114
	Previous Birth	No Previous Birth	White Non-Hisp	Black Non-Hisp	Hispanic
Min Wage	-0.0270***	-0.0312***	-0.0164*	-0.0020	-0.0166**
	(0.0061)	(0.0068)	(0.0086)	(0.0091)	(0.0067)
EITC Max	-0.0168	-0.0003	-0.0111	-0.0176**	-0.0266**
	(0.0162)	(0.0097)	(0.0113)	(0.0077)	(0.0111)
N	50,910	40,819	50,102	22,158	19,965
Sample Mean	0.136	0.143	0.163	0.105	0.081
	18-25 Year-olds	Lagged Measures	Logged Measures	EITC Multiplier	Relative Min Wage
Min Wage	-0.0194**	-0.0119***	-0.1283***	-0.0167***	-0.2046**
	(0.0083)	(0.0041)	(0.0425)	(0.0044)	(0.0853)
EITC Max	-0.0226*	-0.0184**	-0.1646**	-0.1453***	-0.0192**
	(0.0113)	(0.0091)	(0.0647)	(0.0524)	(0.0071)
N	39,901	108,260	108,260	108,260	108,260
Sample Mean	0.154	0.141	0.141	0.141	0.141

All models control for state and year fixed effects, month of conception fixed effects, respondent's race, ethnicity, age, education, marital status, time between birth and interview, survey phase, state mental health care supply, state unemployment rate, political party of state governor, Medicaid expansion, and TANF levels. All observations are weighted using sample weights and standard errors clustered at the state level are in parenthesis. Policy variables are for year of conception. EITC Max is in thousands of dollars. All models are for main sample, observations without a 4-year college education, unless otherwise stated, and using PRAMS data for 2012-2018 births. *** p<$0.01, ** p<$0.05, * p<$0.1.

Table 5. Marginal Effects of Safety-Net Policies on Postpartum Depression

	Min Wage Only	EITC Only	TANF Only	Med Exp Only	All Included
Min Wage	-0.0059*				-0.0060**
	(0.0031)				(0.0025)
EITC Max		-0.0059			-0.0053
		(0.0080)			(0.0075)
TANF			0.0889		0.1524**
			(0.0675)		(0.0563)
Med Exp				-0.0064	-0.0042
				(0.0058)	(0.0054)
N	109,845	109,845	109,845	109,845	109,845
Sample Mean	0.140	0.140	0.140	0.140	0.140

All models control for state and year fixed effects, month of interview fixed effects, respondent's race, ethnicity, age, education, time between birth and interview, state mental health care supply, state unemployment rate, time between birth and interview and political party of state governor. All observations are weighted using sample weights and standard errors clustered at the state level are in parenthesis. Policy variables are for year of conception. EITC Max and TANF are in thousands of dollars. All models are for observations without a 4-year college education, using PRAMS data for 2012-2018 births. *** p<$0.01, ** p<$0.05, * p<$0.1.

Table 6. Alternative Samples and Specifications for Postpartum Depression

	Main Sample	Drop Unemp Rate	College Plus	Less than HS	Married
Min Wage	-0.0060**	-0.0060**	-0.0030	-0.0169**	-0.0069*
	(0.0025)	(0.0027)	(0.0023)	(0.0073)	(0.0032)
EITC Max	-0.0053	-0.0030	-0.0006	-0.0159	0.0044
	(0.0075)	(0.0072)	(0.0064)	(0.0192)	(0.0090)
N	109,845	109,845	56,150	19,674	52,395
Sample Mean	0.140	0.140	0.075	0.156	0.093
	Previous Birth	No Previous Birth	White Non-Hisp	Black Non-Hisp	Hispanic
Min Wage	-0.0111***	-0.0039	-0.0090***	-0.0015	-0.0000
	(0.0040)	(0.0098)	(0.0029)	(0.0084)	(0.0032)
EITC Max	0.0027	-0.0084	-0.0120	-0.0115	0.0065
	(0.0153)	(0.0107)	(0.0159)	(0.0100)	(0.0074)
N	51,745	40,897	50,648	22,484	20,348
Sample Mean	0.137	0.142	0.137	0.172	0.109
	18-25 Year-olds	Controlling for DB	Had DB	Did Not Have DB	Postpartum Well-being
Min Wage	-0.0096	-0.0042*	0.0032	-0.0050*	0.0960*
	(0.0070)	(0.0024)	(0.0122)	(0.0028)	(0.0051)
EITC Max	0.0004	-0.0031	-0.0346	0.0018	0.0029
	(0.0103)	(0.0073)	(0.0350)	(0.0053)	(0.0111)
N	40,416	108,250	16,236	92,024	109,845
Sample Mean	0.168	0.140	0.304	0.113	0.599

All models control for state and year fixed effects, month of conception fixed effects, respondent's race, ethnicity, age, education, time between birth and interview, state mental health care supply, state unemployment rate, Medicaid expansion, TANF levels, and political party of state governor. All observations are weighted using sample weights and standard errors clustered at the state level are in parenthesis. Policy variables are for year of birth. EITC Max in is thousands of dollars. All models are for main sample, observations without a 4-year college education, unless otherwise stated, using PRAMS data for 2012-2018 births. *** p<$0.01, ** p<$0.05, * p<$0.1.

Table 7. Marginal Effects of Safety-Net Policies on BRFSS "Not Good" Mental Health Days During Pregnancy

	Number of Days		10+ Days		All 30 Days	
	Included Separately	All included	Included Separately	All included	Included Separately	All included
Min Wage	0.0330	0.2146	-0.0181*	-0.0056	-0.0081	-0.0013
	(0.2800)	(0.2808)	(0.0106)	(0.0102)	(0.0059)	(0.0069)
EITC Max	-0.5912***	-0.6360***	-0.0237***	-0.0220***	-0.0103***	-0.0094***
	(0.1543)	(0.1676)	(0.0058)	(0.0061)	(0.0031)	(0.0033)
TANF	-5.9710	-1.986	-0.3217	-0.0172	-0.1766	-0.0387
	(7.5933)	(6.6951)	(0.2287)	(0.1831)	(0.1699)	(0.1571)
Med Exp	0.4229	0.4614	-0.0276	-0.0154	-0.0169	-0.0122
	(0.8305)	(0.8348)	(0.0247)	(0.0268)	(0.0131)	(0.0147)
N	10,293	10,452	10,452	10,452	10,452	10,452
Sample Mean	4.948	4.948	0.163	0.163	0.059	0.059

All models control for state and year fixed effects, month of interview fixed effects, respondent's race, ethnicity, age, education, time between birth and interview, state mental health care supply, state unemployment rate, and political party of state governor. All observations are weighted using sample weights and standard errors clustered at the state level are in parenthesis. Policy variables are for year of interview. EITC Max in is thousands of dollars. All models are for pregnant observations without a 4-year college education, using BRFSS data for 2012-2018 data. *** p<$0.01, ** p<$0.05, * p<$0.1.

Table 8. Marginal Effects of Safety-Net Policies on Financial Stress Outcomes

	Problems Paying Bills			Lost Job, Pay, or Hours		
	Main Sample	Less than HS	College Plus	Main Sample	Less than HS	College Plus
Min Wage	-0.0053	-0.0183**	-0.0012	-0.0196**	0.0059	-0.0007
	(0.0051)	(0.0087)	(0.0026)	(0.0074)	(0.0136)	(0.0044)
EITC Max	-0.0045	0.0144	-0.0079	-0.0136	-0.0438	0.0082
	(0.0138)	(0.0240)	(0.0128)	(0.0099)	(0.0338)	(0.0101)
TANF	0.0366	-0.0224	0.0866	-0.1323	0.0734	0.1402
	(0.1032)	(0.2068)	(0.1567)	(0.2805)	(0.4596)	(0.1348)
Med Exp	-0.0155	-0.0277	0.0111	-0.0214	-0.0765**	-0.0018
	(0.0117)	(0.0315)	(0.0089)	(0.0181)	(0.0306)	(0.0173)
N	97,086	17,239	48,544	94,862	16,672	47,962
Sample Mean	0.236	0.221	0.080	0.321	0.321	0.156

All models control for state and year fixed effects, month of conception fixed effects, respondent's race, ethnicity, age, education, time between birth and interview, state mental health care supply, state unemployment rate, Medicaid expansion, TANF levels, and political party of state governor. All observations are weighted using sample weights and standard errors clustered at the state level are in parenthesis. EITC Max is in thousands of dollars. Policy variables are for year of conception. All models use PRAMS data for 2012-2018 births *** p<$0.01, ** p<$0.05, * p<$0.1.

Table 9. Marginal Effects of Safety-Net Policies on Uninsurance Status, Pregnancy Intention, Utilization, and Birth Outcomes

1. Intention and Uninsurance

	Pregnancy Intention		Uninsurance	
	Planned Pregnancy	Before Pregnancy	During Pregnancy	Date of Interview
Min Wage	0.0065	0.0099	-0.0046**	-0.0018
	(0.0065)	(0.0089)	(0.0018)	(0.0087)
EITC Max	-0.0261**	0.0424***	0.0010	0.0183
	(0.0119)	(0.0129)	(0.0091)	(0.0124)
TANF	0.0000	0.0534	-0.0318	0.1670
	(0.0001)	(0.1179)	(0.0403)	(0.1419)
Med Exp	-0.0014	-0.0496***	-0.0128***	-0.0130
	(0.0055)	(0.0151)	(0.0041)	(0.0204)
N	109,764	109,736	95,584	109,670
Sample Mean	0.436	0.212	0.042	0.159

2. Care and Outcomes

	Care Utilization		Birth Outcomes	
	Postpartum Checkup	Talked to a HCW about PPD	Low Birth Weight	Preterm Birth
Min Wage	0.0023	-0.0079	-0.0024	0.0021
	(0.0029)	(0.0130)	(0.0020)	(0.0025)
EITC Max	0.0056	0.0101	-0.0108**	-0.0020
	(0.0061)	(0.0115)	0.0050	(0.0048)
TANF	0.0896	-0.1307	0.0648	-0.0925
	(0.0649)	(0.4036)	(0.0438)	(0.0552)
Med Exp	-0.0050	-0.0165*	0.0038	-0.0005
	(0.0071)	(0.0091)	(0.0044)	(0.0068)
N	109,459	71,781	102,573	109,845
Sample Mean	0.879	0.760	0.072	0.101

All models control for state and year fixed effects, month of conception fixed effects, demographics, time between birth and interview, mental health care supply, unemployment rate, and political party of state governor. All observations are weighted using sample weights and standard errors clustered at the state level are in parenthesis. EITC Max is in thousands of dollars. Policy variables are for year of birth. All observations are birth givers without a 4-year college education. *** p<$0.01, ** p<$0.05, * p<$0.1.