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Family Economic Security Policies and Child and Family Health

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Abstract

In this review we examine the effects of family economic security policies (i.e., minimum wage, Earned Income Tax Credit, unemployment insurance, Temporary Assistance to Needy Families) on child and family health outcomes, summarize policy generosity across states in the U.S., and discuss directions and possibilities for future research. This manuscript is an update to a review article that was published in 2014. Millions of Americans are affected by family economic security policies each year, many of whom are the most vulnerable in society. There is increasing evidence that these policies impact health outcomes and behaviors of adults and children. Further, research indicates that, overall, policies which are more restrictive are associated with poorer health behaviors and outcomes; however, the strength of the evidence differs across each of the four policies. There is significant diversity in state-level policies and it is plausible that these policy variations are contributing to health disparities across and within states. Despite increasing evidence of the relationship between economic policies and health, there continues to be limited attention to this issue. State policy variations offer a valuable opportunity for scientists to conduct natural experiments and contribute to evidence linking social policy effects to family and child wellbeing. The mounting evidence will help to guide future research and policy making for evolving toward a more nurturing society for family and child health and wellbeing.

Keywords

social determinants; economic security; policy; health; family; child

Introduction

Poverty and financial stress are important contributors to poor health (Lantz, House, Mero, & Williams, 2005; Wilkinson & Marmot, 2003) and, in the United States, there is significant evidence that wealthier individuals have better objective measures of health compared to individuals of lower socioeconomic status (Chetty et al., 2016). Disparities in health status by income differ by locality (Chetty et al., 2016) and one plausible contributor to this outcome is the diversity in safety net or economic security policies across the United States.

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There is mounting evidence that, while not explicitly designed to, economic security policies impact the health of individuals (Osypuk, Joshi, Geronimo, & Acevedo-Garcia, 2014) and families (Gassman-Pines & Hill, 2013). The impact of economic security policies may be especially important for infants and children for whom early life disruption has long-term physical and mental health implications (Shonkoff, Boyce, & McEwen, 2009). The mounting evidence, summarized in this paper, will help to guide future research and policy making for evolving toward a more nurturing society that protects and promotes family and child health and wellbeing.

Economic Security Policies

Several policies at the federal and state-level have been implemented to protect low wage workers, promote work, reduce poverty, and provide a safety net for families experiencing job loss. The current paper provides an overview of four main policies: minimum wage, earned income tax credit (EITC), unemployment insurance, and Temporary Assistance for Needy Families (TANF). For all four policies, states have significant power to control eligibility requirements, generosity of financial benefits, and length of time participants are eligible for the programs' benefits.

Minimum Wage

The minimum wage is a statutory wage floor that was designed to protect vulnerable populations from wage exploitation (Grossman, 1978) and minimum wage laws have been established at the Federal level (\$7.25/hour) and by many state and local governments. In 2014, approximately 3 million individuals in the United States worked at jobs that paid at or below the Federal minimum wage, approximately 63% were women and 54% were individuals with a high school education or less (U.S. Bureau of Labor Statistics, 2015).

Earned Income Tax Credit

The Earned Income Tax Credit (EITC) is a tax credit for which working individuals and couples can apply via their federal or state taxes. Currently, the federal government, 26 state governments, and the District of Columbia offer EITCs to residents with the overall goals of promoting employment and reducing poverty among low- to moderate-income individuals (CBPP, 2016c). Individuals must have earned income to apply for the EITC and the amount of EITC benefit is dependent on the recipient's filing status (e.g., married, single), income, and number of children. Approximately 27 million families and individuals received the federal-level EITC, which lifted 6.2 million families out of poverty (CBPP, 2016b). The number of households affected by the state-level EITC differs significantly across the 26 states and the District of Columbia. There is currently no consolidated database detailing the number of state-level EITC recipients; however, we provide one example of the potential impact of the EITC here. In recent years approximately 430,000 tax filers received the Massachusetts EITC benefit alone (Massachusetts Budget and Policy Center, 2015).

Unemployment Insurance

Established in 1935, unemployment insurance was designed to provide economic support to individuals who became unemployed at no fault of their own and are seeking work

opportunities (U.S. Social Security Administration, 2015). In 2015, on average, 277,000 individuals made initial claims for unemployment insurance each week (United States Department of Labor, 2016).

Temporary Assistance for Needy Families

In 1996, the Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) established a block grant from the federal government to states known as Temporary Assistance for Needy Families (TANF). TANF is intended to be a short-term economic support for low-income individuals and families that also has social goals including a reduction in out-of-wedlock pregnancies (Social Security Administration, 1996). In fiscal year 2015, approximately 1.3 million families received TANF and, of these families, almost half were one-parent households (Administration for Children & Families, 2016).

Influence of Economic Security Policies on Health

Increasingly, research demonstrates that economic security policies influence a wide range of health and health-behaviors of individuals (Osypuk et al., 2014) and families (Gassman-Pines & Hill, 2013). Economic security policies likely influence health outcomes via numerous mechanisms such as changing the broad social conditions that ultimately affect individual- and community-level susceptibility, experiences, and responses to poor economic conditions (Kelli A Komro et al., 2014). The conceptual model presented in Figure 1 (Kelli A Komro et al., 2014) highlights two key pathways in which family economic security policies potentially affect social determinants of child and family health. First, family economic security policies might alter social conditions in ways that reduce disparities in exposures to toxic and health-compromising environments and increase protective environments. Second, social conditions and environments can facilitate healthy behaviors and impede unhealthy behaviors among parents and their children. Disparities in economic conditions fundamentally affect the social conditions in which people live, and social conditions influence behaviors and environments that ultimately affect population health outcomes and health disparities across the life-course.

Despite the broad reach that these policies have on the American public and the potential for these policies to impact a wide-range of health behaviors, few studies have been conducted to examine how the policies affect health and health behaviors. This current paper updates previous reviews related to four critical, state-level economic security policies: minimum wage, EITC, unemployment insurance and TANF. We elaborate on variations in these policies across states, examine the literature examining economic security policies and health, and propose directions for future research related to these policies.

State Level Variations in Economic Security Policies

Increasing state-level control of several family economic security programs has enhanced state governments' opportunities to impact the economic security of millions of individuals and families. However, a negative side effect of increased state-level control has been large policy differences across the states, resulting in significant disparities in the social safety net depending on where you live.

Minimum Wage

While the federal minimum wage has been fixed at \$7.25 per hour since 2010, there is significant variation in minimum wages across and within individual states. Twenty-nine states and the District of Columbia have set minimum wages above the federal rate, with California and Massachusetts having the highest wages at a minimum of \$10.00 per hour (DOL, 2016). In addition, 14 states have a minimum wage equal to the federal rate, two states have minimum wages below the federal rate and five have no minimum wage requirements (Figure 2). In the two latter groups, the federal minimum wage still applies to any business with at least \$500,000 in annual sales, any business engaged in interstate commerce, as well as all hospitals, schools, and government employees (DOL, 2016). Further, 30 localities have additionally adopted laws that set the minimum wage to a level above their state minimum wage leading to significant local variation in minimum wage within states as well as between them (The Economic Policy Institute, 2016).

Fig 2 Minimum Wage laws in the United States. Image provided by the U.S. Department of Labor

Earned Income Tax Credit (EITC)

Twenty-six states and the District of Columbia have enacted EITCs (Figure 3). State EITCs are typically set as a percentage of the federal credit and, in 2015, total values range from 3.5 percent or a maximum benefit of \$218 for a family with 3+ children in Louisiana to 40 percent or a maximum benefit of \$2497 for a family with 3+ children in the District of Columbia (Williams, 2016b). The amount of EITC rewarded is also affected by a recipient's income, marital status and number of children (CBPP, 2016b) and in 23 states the EITC is refundable (i.e., participants may receive an EITC refund check, even if they do not owe income taxes) (CBPP, 2016b). For example, in 2012 in Louisiana, a working family without qualifying children would receive a maximum state credit of \$16, \$110 with one child, \$183 with two children, and \$206 with three children (Spire, 2012).

Fig 3 States with refundable and non-refundable EITCs. Image used with permission from the Center of Budget Policies and Priorities, cbpp.org

Unemployment Insurance

Individual states have the ability to set their own eligibility criteria and benefit levels for unemployment insurance benefits (compensation). Forty-one state unemployment insurance benefit programs provide benefits for 26 weeks (Figure 4), up to a maximum cash benefit amount (CBPP, 2015). For example, an individual who lost his or her job in 2016 would be eligible for 30 weeks of benefits in Massachusetts, but only thirteen weeks in North Carolina (CBPP, 2016a). In addition to the regular unemployment insurance program, the Extended Benefits (EB) program provides an additional 13 or 20 weeks of compensation in states with severe unemployment. Normally, the federal government and the states divide the cost of EB, however, between 2008–2013 the federal government assumed full funding of EB and created the Emergency unemployment compensation program, to provide additional benefits to the unemployed (CBPP, 2015).

Fig 4 Maximum duration of unemployment insurance in the United States. Image used with permission from the Center of Budget Policies and Priorities, cbpp.org

Temporary Assistance for Needy Families (TANF)

Of the four policies examined in this paper, TANF has the greatest potential to vary across states. State governments have significant control of aspects of TANF including, for example, work requirements, work waivers for survivors of domestic violence, eligibility criteria, and time limits (Bloom, Loprest, & Zedlewski, 2011; Huber, Cohen, Briggs, & Kassabian, 2015). There is variation even within states; Colorado and California allow policies to vary between counties.

Variations in state-level TANF policies affect the percentage of TANF-eligible families who qualify for and receive TANF benefits as well as the services available to TANF recipients. In 2014, only 23 of every 100 U.S. families with children in poverty received cash benefits from TANF (Floyd, Pavetti, & Schott, 2015). This ratio ranged from 4 in 100 Louisiana families in poverty, to a high of 78 in 100 Vermont families in poverty (Figure 5). The percentage of families at or below the federal poverty line who are receiving TANF benefits dropped precipitously in 2013, largely due to policies which have shortened or otherwise changed their time limits, or created more stringent application requirements (Floyd et al., 2015). For example, in May 2012, Maine enacted a 60-month time limit that was applied retroactively to enrollees, contributing to a 53% reduction in caseloads between 2006 and 2014. To the same effect, Indiana reduced its TANF caseload by 77% in the same amount of time by changing its work requirement policies, including requiring applicants to complete 20 days of job searching before receiving benefits (Floyd et al., 2015). In addition to eligibility requirements, the support available to TANF recipients also varies within and across states. For a family of three, the maximum cash benefit ranges from \$204 in Arkansas to \$1628 in Virginia (Huber et al., 2015). TANF recipients, especially those considered “hard to employ,” (e.g., individuals with disabilities, criminal backgrounds, limited education, or experience with domestic violence) also have varying access to employment, case management, and training programs depending on their location (Bloom et al., 2011).

Fig 5 TANF-Poverty Ratios in the United States. Image used with permission from the Center of Budget Policies and Priorities, cbpp.org

In sum, there is significant variation in economic policies across states. State policy variations offer a valuable opportunity for scientists to conduct natural experiments and contribute to evidence linking social policy effects to family and child wellbeing. Scientific evidence regarding health effects can then be disseminated to policymakers to inform their decisions.

Effects of Economic Security Policies on Health

The following section updates prior reviews of the literature examining the relationship between minimum wage, EITC, unemployment insurance and TANF policies and health. We conducted a comprehensive search of the published literature using 4 databases: Tomson Reuters ISI Web of Knowledge (2011–2016); PubMed (2011–2016); Cochrane Library

(2011–2016); and Campbell Collaboration Library (2011–2016). We also searched the National Bureau of Economic Research, a private, non-profit, non-partisan organization that focused on economic research and research dissemination as well as the Urban Institute, a non-partisan research organization founded in 1948 that has a specific focus on TANF policies, for publications related to these policies and health. The literature reviewed in the current manuscript are summarized in Table 1.

Search terms for each database were as follows: [(EITC OR earned income tax credit OR “minimum wage” OR TANF OR “unemployment insurance”) AND (health)]. Any record with any search term in the title, keywords, subject heading, descriptors, or abstract field was identified. In addition, we located other relevant studies in the reference lists of the selected articles. We obtained each article and reviewed it for relevance and content. Studies were not retained if they were: 1) duplicate publications of a single study; 2) a commentary with no supporting data; 3) did not focus exclusively on the US population; or 4) not written in English.

Our search included perceived or objectively measured mental or physical health as the main outcome measure. We also included manuscripts that examined mediators of health (i.e., smoking) or factors that could plausibly contribute to health status (i.e., unmet medical need and educational attainment of children) as the main outcome measure. We maintained a broad range of potential health topics due to the potential for economic policies to impact a wide range of health and health-related behaviors (see discussion above). Further we included examinations of both federal and state-level family economic security programs based on the belief that both types of policies would have the same hypothesized pathways to health. The only manuscripts that we excluded from this review included those that only examined access to health insurance because of the significant change in access to health insurance due to the enactment of the Affordable Care Act (2010).

The content of our search also revealed a wide-range of methods used to analyze the impact of policy on health including the difference-in-difference approach (O. Ashenfelter, 1978; O. C. Ashenfelter & Card, 1984). Because the difference-in-difference approach was one of the more commonly used methods in our studies and a relatively new approach, we describe it here. The difference-in-difference approach is frequently used in econometrics to and relies on observational data collected for two groups over two periods of time. The approach models treatment effects by “computing the difference of the mean outcomes of treated and controls after the treatment and subtract the outcome difference that had been there already before the treatment had any effect.”(Lechner, 2011) Using this approach strengthens causal inference by reducing potential selection bias and addresses any potential differences in observed or unobserved variables between the treatment and control groups (Imbens & Wooldridge, 2009).

Minimum Wage

Recent reviews have identified a significant gap in knowledge related to the impact of minimum wage policy on health (Kelli A Komro et al., 2014; Osypuk et al., 2014). Previous studies have examined the relationship between minimum wage changes and obesity as well

as access to healthcare, and these studies have produced mixed results. We review here five recent original research articles that examine the impact of minimum wage on health.

Lenhart (2016) examined the effect of generosity of minimum wages across the 24 OECD countries on life expectancy at birth, overall mortality rate, and mortality rate due to diabetes, diseases of the circulatory system, diseases of the digestive system, stroke, heart attack, and external factors, as well as potential mediating pathways. Minimum wage generosity was quantified with the Kaitz index, which measures “the ratio between a country’s minimum wage and the mean wages of full-time workers, multiplied by the percent of workers covered by the minimum wage in the country in a given year” (Lehart, 2016). Data were included for 24 OECD countries over 30 years (1980–2010). The regression analysis examined the effects of within-country variation in the minimum wage on the health outcomes, controlling for potential within-country covariates (e.g., population over 65, real GDP per capita). Increases in the generosity of minimum wages was associated with decreased mortality rates, overall and for each of the causes). A 10% point increase in the Kaitz index reduced death rates per 100,000 individuals due to all causes by nearly 22 and life expectancy at birth increased by 0.44 years. Increases in minimum wage generosity was also significantly associated with 4 (poverty, unmet medical needs, doctor consultations per capita, tobacco consumption) of the 6 potential mechanism examined.

Tsao and colleagues used the New York City Department of Health and Mental Hygiene Vital Statistics data to perform multiple simulations of how an increase in the minimum wage to \$15/hour would impact premature deaths among adults younger than age 65 living in New York City for the period of 2008 to 2012 (Tsao et al.). Prior to conducting the simulations, the authors estimated the crude early mortality rates across 59 community districts in New York City and examined the association between premature mortality and the proportion of low income residents within each community district. The authors found a significant association between the proportion of low-income individuals and crude premature death, specifically “a 1% increase in the low-income population was associated with almost 3 additional premature deaths per 100 000 community district residents.” The authors then performed three simulations to examine the expected decrease in proportion of low-income individuals based on an increase in the minimum wage. Specifically, authors examined three scenarios for non-self-employed workers who earned between \$7.15/hour and \$15/hour: scenario 1) the rise in minimum wage to \$15/hour would not have spillover or employment effects; scenario 2) the rise in minimum wage would have spillover but no employment effects; and scenario 3) the rise in minimum wage would decrease employment of individuals making between \$7.15/hour and \$15/hour and would have no spillover effects. The authors found that the proportion of low-income residents decreases under all three scenarios, although to a much more modest extent in the most “pessimistic scenario” (scenario 3). The authors then estimated the crude rates of premature death based on the proportion of low-income individuals under each of the three simulated scenarios. Ultimately, the authors conclude that a rise in the minimum wage to \$15 per hour could reduce premature death by between 8 and 15 per 100,000 individuals. This translates to 2800 fewer premature deaths in the most pessimistic and 5500 fewer premature deaths in the most optimistic scenario.

Komro and colleagues investigated the effects of state minimum wage laws on low birth weight and infant mortality using state-level minimum wage legal data and infant health data from the National Vital Statistics System (K.A. Komro, Livingston, Markowitz, & Wagenaar, 2016). They evaluated the effects of 206 legal changes in state minimum wages from 1980 to 2011. Over this time period, they calculated the difference between state-level minimum wage and the federal minimum wage in each state and month. The analysis accounted for any changes over time in infant outcomes common across states and time-invariant differences between states. The research design efficiently controls for a host of other factors affecting birth outcomes, both measured and unmeasured. Results showed a consistent pattern over time of health improvement associated with a higher state minimum wage. Across all models analyzed, a dollar increase in the minimum wage above the federal level was associated with a significant 1 to 2 percent decrease in low weight births (crude %change -1.9, CI -3.1, -0.7; adjusted %change -1.1, CI -2.1, -0.1) and a 4 percent decrease in postneonatal mortality (crude %change -4.9, CI -7.3, -2.5; adjusted %change -4.0, CI -6.4, -1.6). Results indicate that if all states in 2014 had increased their minimum wage by \$1, there would likely have been 2,790 fewer babies born with lower birth weights and 518 fewer post-neonatal deaths.

In a similar study, Wehby and colleagues use a difference-in-differences approach to examine the impact of state-level effective minimum wage laws on the birth outcomes of mothers who have a high school degree or less and are between the ages of 18 to 39 years old at time of pregnancy (Wehby, Dave, & Kaestner, 2016). Specifically, the authors examine the impact of effective state minimum wages on infant health (birth weight and gestation) as well as potential mechanisms affecting birth outcomes (prenatal smoking, number of prenatal visits, and number of months that elapsed before prenatal care was sought). Wehby and colleagues find that, for mothers without a high school diploma, a 10% increase in the minimum wage relative to the median wage is associated with a 10-gram increase in birth weight; a 0.2 percentage point decrease in low birth weight; and a 0.2 gram increase in fetal growth. Further, the authors find evidence that a reduction in smoking during pregnancy and increase in prenatal care were linked to an increase in minimum wage and may be contributing to positive infant health outcomes. However, findings regarding these mechanisms should be interpreted with caution due to large confidence intervals and small effect sizes.

Hoke and Cotti explored a potential detrimental effect of increased minimum wages on teenagers (Hoke & Cotti, 2015). They hypothesized that an increased minimum wage leads to increased disposable income among teenagers, which leads to increased financial access to alcohol. They applied a fixed effects regression model to Youth Risk Behavior Survey (YRBS) data and minimum wage data from the Bureau of Labor Statistics for the period of 1991 to 2011 to examine the relationship between underage binge drinking (5+ drinks in one sitting) and the effective state minimum wage. Controlling for state and time fixed effects, demographic characteristics, risky behaviors, and beer tax rates, the authors conclude that a \$1 increase in minimum wage is associated with a 9% increase in binge drinking among teenagers (IRR: 1.09) and that this effect is especially prominent for males (IRR: 1.12). They conclude that policymakers need to consider possible unexpected effects and “consider parallel policies to help mitigate potential negative consequences” (Hoke & Cotti, 2015).

The impact of minimum wage on health remains understudied; however, there is increasing evidence that increases in minimum wage are associated with reduced mortality and improved birth outcomes. The relationship between the minimum wage and adult health remains mixed, however, with increased minimum wages leading to greater access to alcohol among teenagers, although this detrimental effect could be countered with alcohol control policies to protect underage youth. On the positive side, increases in minimum wages potentially improve health outcomes through the reduction of poverty, improved access to health care, and tobacco use. Further investigation into the amount of increase in minimum wage necessary to improve health in various populations upon which the policy is most likely to have influence (i.e., adult individuals with less than a college degree, young adults, and the children of minimum wage earners) is warranted.

Earned Income Tax Credit

There have been several reviews of the EITC-health literature published in recent years including Pega et al. (Pega, Carter, Blakely, & Lucas, 2013), Komro and colleagues (Kelli A Komro et al., 2014) and Gassman-Pines and Hill (Gassman-Pines & Hill, 2013). In general, the reviewers have found that, while the evidence for the direct impact of EITC receipt on health is limited, there is substantial evidence that EITC positively impacts income and increasing evidence that EITC receipt and generosity (i.e., the amount of EITC provided) is associated with improved health behaviors (Gassman-Pines & Hill, 2013; Kelli A Komro et al., 2014; Pega et al., 2013). Because the reviews by Gassman-Pines and Hill as well as Komro and colleagues included studies that examined factors that more broadly link to health, including employment, health insurance, and child development, they concluded that the EITC likely has a positive influence on family and child health, specifically birth outcomes and educational outcomes. Potential mechanisms that connect EITC receipt to health include health behaviors (i.e., maternal smoking), healthcare utilization during pregnancy, and by reducing stress. We review six recent original research articles that study the impact of EITC on varying measures of health and health behaviors and that were not included in prior reviews.

Utilizing data from the Child and Young Adult Supplement to the 1979 National Longitudinal Survey of Youth, Baughman and Duchovny explored how variations in state-level EITCs impact children's health (Baughman & Duchovny, 2016). They found that an increase in the amount of the EITC, as represented by a simulated benefit variable that equals the median state EITC value in the sample for each state-year combination, was associated with improvements in the mother-rated health status of children ages 6–14 years old. Specifically, “a \$100 increase in the median simulated value of the state EITC is associated with a 1.2 percentage point decrease in the probability that a mother reports her child to be in fair or poor health status, translating to 35 percent decrease relative to the group mean. There is also a 3.4 percentage point, or 5 percent, increase in the probability that a mother reports her child to be in excellent health.” No association was found for children 5 years old or younger. Further, the authors identified an increase in the use of private health insurance (increase of 6 percent relative to the group mean) and a corresponding decrease in public health insurance which resulted in no net impact to overall percentage insured for children ages 6–14 years old.

Hamad and Rehkopf used data from the US National Longitudinal Survey of Youth from 1986–2000 to examine the impact of higher income and federal EITC receipt on children's problem behaviors and home environments (Hamad & Rehkopf, 2016). Overall, they found that higher incomes (per \$1,000, $\beta = -0.47$) and EITC benefits (per \$1,000, $\beta = -0.57$) are associated with a small but significant improvement in short-term measures of children's problem behaviors. Using the same dataset, Hamad and Rehkopf concluded that EITC payment size for which the mother was eligible in the prior year marginally associated with subsequent year indicators of perinatal health including increased birthweight ($\beta = 65.1$ grams per \$1,000), likelihood of breastfeeding ($\beta = 0.042$ per \$1,000), and likelihood of going to term ($\beta = 0.032$ per \$1,000) (Hamad & Rehkopf, 2015).

Bruckner et al evaluated data from the California Birth File and examined whether exposure to the EITC credit during gestation would reduce the odds of very low birth weight (weight < 1500 grams) among infants born to low-income African American women (Bruckner, Rehkopf, & Catalano, 2013). Infants were considered as having been exposed to the EITC credit if they were in gestation during the months of February and March—the months during which most EITC credits are received—during the period of 1991 through 1997. The comparison group was infants born in 1989 and 1997 when many low-income families did not file for the EITC due to the complexity of the tax code and infants who were not in gestation in February and March during the period of 1991 through 1997. The authors hypothesized that, compared to the unexposed, there would be a reduced likelihood of very low birth weight among exposed infants. The authors findings were contrary to their hypothesis: the occurrence of very low-weight birth among the exposed was greater than the expected risk two-months after receipt of the EITC. Specifically, two months after EITC disbursement, there was a 37% increase in the odds of very low birth weight among infants born to low-income African American women above mean levels (i.e., .0091/.0245). The authors suggest that receipt of a relatively large cash transfer might have created additional stress on the pregnant women which contributed to the poorer than expected health outcomes.

Hoynes and colleagues leveraged tax-reform induced variation in the federal EITC to explore the impact of the EITC credit on birth weight and low birth weight (weight <2,500 grams) (Hoynes, Miller, & Simon, 2015). The authors examined US Vital Statistics data for the period of 1984 through 1999, a time frame during which the federal EITC was expanded twice (1986 and 1993). The authors concluded that EITC expansion was associated with a decrease in the incidence of low birth weight and increases in mean birth weight. Specifically, a \$1,000 treatment-on-the-treated leads to a 2 to 3 percent decline in low birth weight. Compared to whites, greater effects were found for African American mothers. The authors explore several mechanisms by which the EITC might be related to improved infant health and find a plausible relationship between EITC generosity and reduced maternal smoking and increased prenatal care.

Using a difference-in-differences approach, Boyd-Swan examined the federal expansion of the EITC in 1990 on measures of depression and subjective well-being of female adults using data from the National Survey of Families and Households conducted in 1987–88 and 1992–94 (Boyd-Swan, Herbst, Ifcher, & Zarghamee, 2016). The authors conclude that,

compared to women without children, married mothers report a significant 4.4% increase in measures of happiness, 10.1% increase in measures of self-esteem, and a 15.7% decrease in measures of depression after the EITC expansion. The effects for unmarried mothers, the group most likely to benefit from the EITC, were mostly insignificant.

Using a difference-in-difference approach, Rehkopf et al. examined data from the U.S. National Health and Nutrition Examination Survey (NHANES) to explore the short-term impact of EITC receipt on measures of adult physical health and health behaviors (Rehkopf, Strully, & Dow, 2014). The authors compared the health behaviors and measures of the treatment group—individuals eligible for \$1000 or more in EITC benefits during the months the EITC is received (i.e., February–April)—compared to those not eligible for \$1000 or more in EITC benefits and the EITC eligible group during the non-exposure months of May–January. The authors examined results separately for men and women and, compared to the control groups, the authors found that some indicators of health were worse (e.g., increased saturated fat for men and increased sodium and triglycerides for women) and others were better (e.g., less food insecurity for men and women) for the treatment group. In total for men, the authors found that seven indicators of health were associated with improvements in health and one was associated with worse health worsened and, for women, nine indicators of health had improved and four were associated with poorer health. On balance, therefore, more indicators of health had improved than worsened.

We find that the recent literature offers an overall mixed picture of the impact of EITC exposure on adult and infant health. Similar to articles included in prior reviews, the strongest evidence for the impact of EITC on health indicates positive effects on subjective measures of health and health behaviors. However, the impact of EITC receipt on objective and longer-term measures of health remains less clear. Further, while the common use of the difference-in-difference approach strengthens causal inference, most studies are only able to calculate the amount of EITC for which the family is eligible or a simulated amount received, rather than the actual amount received. This leaves a significant gap in understanding of how access to the EITC may play a role in positively impacting health.

Unemployment Insurance

There is a limited number of studies examining the impact of unemployment insurance policies on family and child health; however, prior reviews indicate that there is some evidence that receipt of and the generosity of unemployment insurance benefits can positively affect health behaviors and outcomes (Kelli A Komro et al., 2014; O’Campo et al., 2015). The few studies that have examined the impact of unemployment insurance benefits on health have, for the most part, examined objective measures of health including suicide, cardiovascular disease, and BMI. Two publications that were not included in prior reviews are discussed here and both focus on subjective measures of health.

Using indexes of Google searches for the terms “depression” and “anxiety” and unemployment data from the U.S. Department of Labor for the period 2004 through 2009, Tefft examined the impact of unemployment rates and unemployment insurance claims on mental health concerns (Tefft, 2011). Tefft found a positive association between monthly unemployment rates and the online search indexes for depression and a negative association

between initial unemployment insurance claims and online search indexes for both depression (-0.27) and anxiety (-0.33). The author also examined the potential of state-level measures of generosity to impact depression and anxiety searches. Specifically, Tefft compared depression and anxiety search indexes in states that require a week-long waiting period before an unemployed worker becomes eligible for benefits to states that do not require a waiting period. He concluded that there was a larger reduction in indicators of psychological distress when the claim is finally made among unemployed workers within states with a waiting period.

Using data from the 1984–2009 waves of the Panel Study of Income Dynamics and unemployment benefit information from the U.S. Department of Labor, Cylus and colleagues examined the impact of unemployment benefit generosity on self-reported health status among adult men and women (Cylus, Glymour, & Avendano, 2015). When examining the probability of reporting poor health by generosity of total unemployment benefits across employment status and by gender, the authors identified different patterns for men and women. The likelihood of reporting poor health was consistently higher for unemployed versus employed workers regardless of gender. However, compared to unemployed women, unemployed men seemed to respond more positively in their self-reported health ratings when the allowable real unemployment benefit amount increased. Thus, the authors conducted the main outcome analyses separately by gender and found that more generous unemployment benefits were associated with a lower likelihood of self-reported poor health among unemployed men (b for interaction between joblessness and benefits = -0.124 ; 95% CI = $-0.197, -0.0523$), “suggesting that a 10% increase in benefits for the unemployed reduces the risk of poor health by 1.3% points (-0.00014 plus -0.0124).” No association was found between unemployment benefit generosity and self-reported health for female heads of household or employed workers.

Overall, the limited literature examining unemployment compensation and health provides evidence that more generous unemployment compensation can alleviate potential negative health consequences associated with unemployment, especially for men.

Temporary Assistance for Needy Families (TANF)

Prior reviews have demonstrated a significant gap in the literature examining the impact of TANF on health (Kelli A Komro et al., 2014; Osypuk et al., 2014). In their review, Komro and colleagues (2014) noted preliminary evidence that more restrictive TANF policies (e.g., efforts to deter enrollment, time limits) were associated with poorer access to healthcare and increased infant mortality (Kelli A Komro et al., 2014). They also found some evidence that TANF receipt may reduce higher-level educational opportunities for women. We include five original research manuscripts that were not included in the aforementioned reviews on the topic of TANF and health.

Wang used the 2004 and 2008 panels of the Survey on Income and Program Participation and applied difference-in-difference and propensity score matching to examine child well-being (Wang, 2015). Children were included in the treatment sample if they had received TANF at any point during the 20–24 months post-baseline and children were included in the comparison sample if they had not received TANF during that same time period and were

similar to the treatment children based on propensity score matching. Child well-being was measured as aspects of 1) cognitive stimulation activities provided to the child; 2) family interactions; 3) family stress; and 4) educational outcomes. Overall, TANF receipt was associated with a 0.29 increase (β : 0.29; SE: 0.10; CI: 0.08–0.49) in number of breakfasts shared between guardians and children per week, 51% increase (OR: 1.50; SE: 0.18; CI: 1.17–1.92) in parents' expectation that the child will attend college compared to non-TANF children, and 42% lower likelihood to repeat a grade (OR: 0.58; SE: 0.13; CI: 0.38–0.90). The author found limited associations between TANF and other dimensions of child well-being. The author also examined how the stringency of TANF benefits (i.e., time limits and sanctioning policies) impacted measures of child well-being. Overall, the author found no significant trend in measures of child well-being across states by leniency of TANF policies.

Chyi and Ozturk employed a correction function approach to the Children of National Longitudinal Survey of Youth 1979 Cohort to examine the effects of welfare use—either AFDC or TANF—and employment decisions of mothers on the short-term cognitive development of their children (Chyi & Ozturk, 2013). The sample included mothers who had 12 years of schooling or less and who have been single for at least 1 year during the first 5 years of their children's life. The authors posited that mothers' employment decisions could affect their children's development in three ways: 1) income; 2) mother's time spent with the children; and 3) the working mother acting as a positive role model for the child. The authors find a small increase in Math PIAT scores for each quarter of a mother's welfare use or work with a significant cumulative effect on scores after 20 quarters of either work or welfare. The authors then examine the impact of variations in welfare and work use by children's "innate" ability—defined by the authors as a composite score of time infrequent variables including the child's birth weight, mother's standardized test scores, mother's education, and mother's age at childbirth. While we do not necessarily agree with the use of the term "innate" and feel that the authors could have factored in other social determinants of health into this construct, we agree with the authors that these factors have been linked to children's later educational performance and thus should be included in the analysis. For children of average innate ability, there was a small increase in Math PIAT scores for each quarter of a mother's welfare use (.39) or work (.07). For a child with the mean level of innate ability and a mother who works and receives welfare for 20 quarters, the child's Math PIAT scores increases by 8.2 points which is the equivalent of an increase of 55% of the standard deviation of the test score. Scores for children with the lowest innate ability increased the most from a combination of welfare use and employment (12.536) while children with the highest levels of innate ability showed no increases in scores.

Using data from the Survey of Income and Program Participation over the period 1994 to 2005, Baltagi and Yen examined the implementation of TANF policies (e.g., time limits, work requirements) on child health status, doctor consultations and nights of hospital stays as reported by parents of children under age 18 years in families where parents have at most a high school degree (Baltagi & Yen, 2014). Overall, the authors found that implementation of TANF was not related to child health status or doctor consultations, but was associated with an increase of 0.31 nights spent in the hospital. With age-group interactions, the number of nights spent in the hospitals increases by .54 nights (p -value=0.01) and time of doctor consultations becomes significant and the number of doctor's consultations increases

by 1.114 (p -value=0.01). When examining the overall effect of the implementation of welfare reform policies on health outcomes by the employment status of the mother, the authors found that children with working mothers were affected differently than those with non-working mothers. For working mothers, work requirements increased the likelihood of reporting poor or fair health and doctor consultations, whereas for non-working mothers, work requirements were associated with a decreased likelihood of reporting poor or fair health and family caps were associated with increased number of hospital stays.

Basu and colleagues used data from the Behavioral Risk Factor Surveillance System for the period of 1993–2012 to examine the impact of welfare reform on measures of women’s health behaviors, mental health, and healthcare utilization (Basu, Rehkopf, Siddiqi, Glymour, & Kawachi, 2016). Their study used a difference-in-difference approach comparing the health of mothers most likely to be affected by the change in policy (i.e., single mothers aged 18–64 years old in 1997) to women who are less likely to be impacted by the policy change (i.e., married mothers and single and married women who are not mothers in 1997). The authors also took a synthetic control approach to further explore the impact of welfare reform on women most likely to be affected by the welfare reform policies. Compared to married mothers, single non-mothers and married non-mothers, welfare reforms appear to be related to poor health behaviors among single mothers including: an absolute 4.0 percentage point increase (95% CI: 0.9, 7.0) in the likelihood of binge drinking (baseline probability of 33%), 2.4 percentage point decrease (95% CI: 0.1, 4.8) in probability of being able to afford medical care (baseline probability of 80%), a 0.8 percentage point decrease (95% CI: 0.6, 2.3) in the probability of cervical cancer screening (baseline probability 90%), and a 0.8 percentage point decrease (95% CI: –2.8, 1.3) in the probability of breast cancer screening (baseline probability of 38%). In the synthetic group analysis, the authors found that health outcomes also appeared to worsen among single mothers after implementation of welfare reform; however, the associations were larger in the synthetic model compared to the difference-in-difference approach. For example, the synthetic control analysis identified a 10.7 percentage point decrease in the probability of having access to medical care compared to the difference-in-difference estimate of 2.4 mentioned above. Using a Markov model, Muennig and colleagues evaluated both the cost and health impact of AFDC (Aid to Families with Dependent Children) and its replacement, TANF (Muennig, Caleyachetty, Rosen, & Korotzer, 2015). The authors applied estimated pooled mortality hazard ratios from two randomized controlled trials conducted with participants from Connecticut Jobs First and the Florida Transition Program and found that AFDC is costlier than TANF, but would bring an additional 0.44 years of life. The resulting incremental cost effectiveness of AFDC relative to TANF is therefore approximately \$64,000 per life-year saved. The authors propose that the reduction in health due to welfare reform may be attributed to mothers who are unable to make the transition from welfare to work for a variety of reasons and therefore lose access to their social safety net due to TANF time limits.

In general, the updated literature provides some evidence that the transition from AFDC to more restrictive welfare reform policies and TANF negatively impacted women’s health and offers mixed evidence for the effect of TANF policy on child health and well-being. Across the studies, working recipients of TANF and their children were affected differently than

non-working recipients and their children. Receipt of TANF appeared to have a more consistent positive influence on the education of children whose mothers are employed.

Summary

Overall, we find that the impact of family economic security policies at the state- and federal-level impact health for both better and for worse. In general, more generous policies have the potential to realize positive health outcomes with the greatest evidence for the healthful impact on children and infants. However, our findings must be discussed within their limitations. While we have taken great care to examine the most relevant sources for research related to policy and health, our review is not systematic and we may have missed some research articles that are unpublished. Further, our findings may be influenced by reporting bias. Finally, due to space limitations and our focus on economic policies, we were unable to explore a number of policies that have high state-level variation and impact on low-income families, such as the Supplemental Nutrition Assistance Program and Child Care Development Block Grant. Additional investigation into the potential impact of these policies on health is warranted. Despite these potential limitations, as well as the diversity of samples and policies discussed in this review, we conclude that family economic security policies have an important influence on health, especially among the most vulnerable in society.

Future Directions for Research

Because the economic security policies discussed in this paper often target individuals with lower socioeconomic status or individuals under financial distress, they should not be considered separately. For example, a review of changes in eligibility and participation in the EITC revealed that receipt of unemployment insurance is predictive of EITC participation (Jones, 2013). Additionally, one study indicates that the expansion of the EITC was associated with a decrease in the Welfare case load during the 1990s (Grogger, 2004). Further, these policies could potentially create an additive effect, influencing health either positively or negatively, since policies in each state may be similarly generous or restrictive (Williams, 2016a). With few exceptions, most studies reviewed in this paper did not examine interactions between the various economic policies or control for other family economic security policy changes; further understanding of how separate and distinct policies combine to create the policy environment and its impact on health is needed.

Future research should additionally explore in more depth the effects of each policy on health by gender. Extant literature indicates that economic policies impact men and women's employment differently (Neumark & Wascher, 2011) and the few studies reviewed in this paper that have conducted analyses separately for men and women have found distinct relationships between policy and health (Cylus et al., 2015; Rehkopf et al., 2014). Given the different employment patterns (U.S. Bureau of Labor Statistics, 2015) and health concerns (Mozaffarian et al., 2015) across gender, researchers should focus on gender differences in the experience of policies specifically related to employment including EITC, unemployment compensation, and minimum wage.

Finally, while there is an overall lack of literature examining the reviewed economic policies and health, there remains a particular need for literature examining the effect of TANF on health and wellbeing. The relationship between TANF and health is likely to be especially complex due to the variations in TANF policies across states which are related to work requirements, sanctioning policies, time limits, and family caps, among others (Huber et al., 2015) and the unique barriers to work that many TANF recipients face in transitioning to employment (Bloom et al., 2011). Longitudinal studies that take into account barriers to employment could help clarify why, for some, employment and work-related income may not have the anticipated positive health effects (Hergenrather, Zeglin, McGuire-Kuletz, & Rhodes, 2015).

Conclusion

There is an urgent need to address health disparities in the U.S., and there is plausible evidence to suggest that economic security policies are an important vehicle to achieve this goal. Overall, prevention science has focused on developing programs to address health disparities, but there is increasing recognition that policy level changes could “ultimately be more important in realizing societies where most people thrive” (Biglan, 2016). Given the number of Americans impacted by the four family economic security policies reviewed in this paper, it is critical that researchers not only explore how policies affect health, but also advocate for policies that support a more nurturing society and are health promoting.

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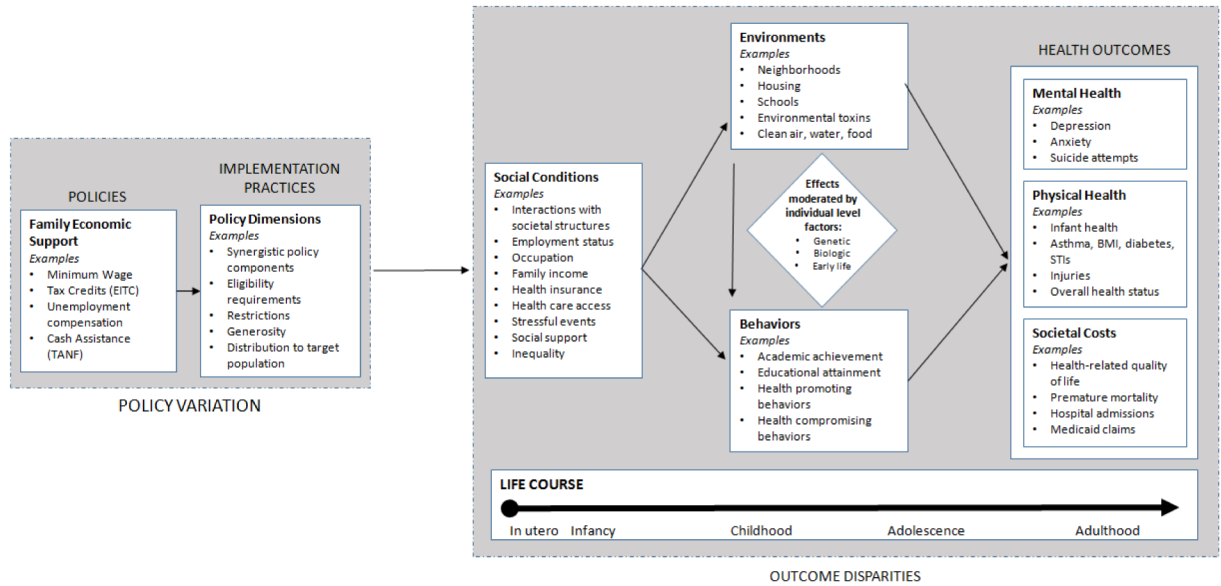


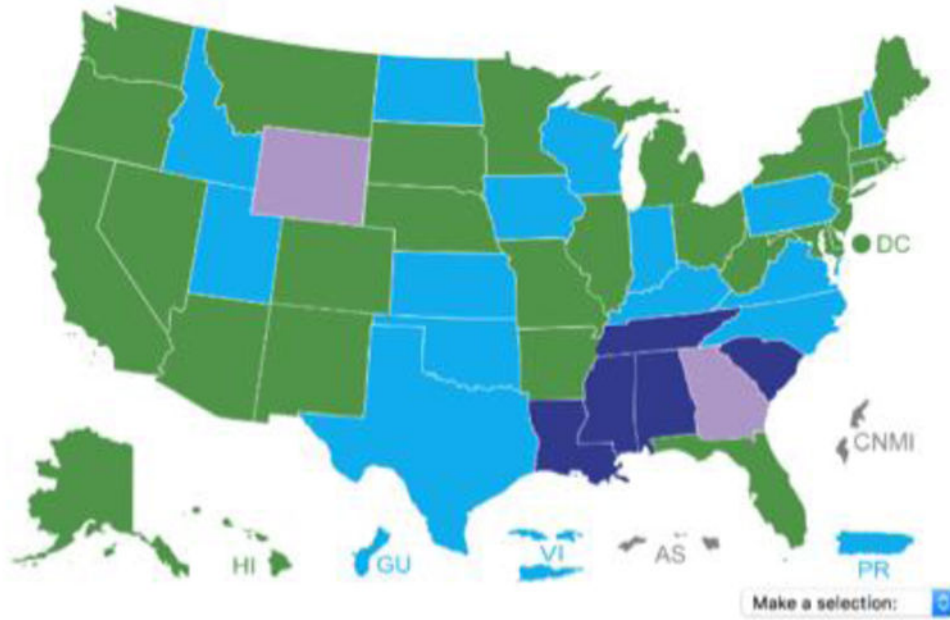
Fig 1. Economic security policy effects on social conditions, environments, health behaviors, and outcomes. Permission granted to use the figure from *Health Behav Policy Rev.* (Komro, K.A., Burris, S. & Wagenaar, A.C. (2014). Social determinants of child health: Concepts and measures for future research. *Health Behavior Policy Rev.*, 1(6), 432–445)

Minimum Wage Laws in the States - January 1, 2016

[Historical Table](#)

Click on any state or jurisdiction to find out about applicable minimum wage laws.

Note: Where federal and state law have different minimum wage rates, the higher standard applies.



- States with minimum wage rates higher than the federal
- States with minimum wage rates the same as the federal
- States with no minimum wage law (federal minimum wage rate applies)
- States with minimum wage rates lower than the federal (federal minimum wage rate applies)
- American Samoa and the Commonwealth of the Northern Mariana Islands have special minimum wage rates.

Fig 2. Minimum Wage laws in the United States. Image provided by the U.S. Department of Labor

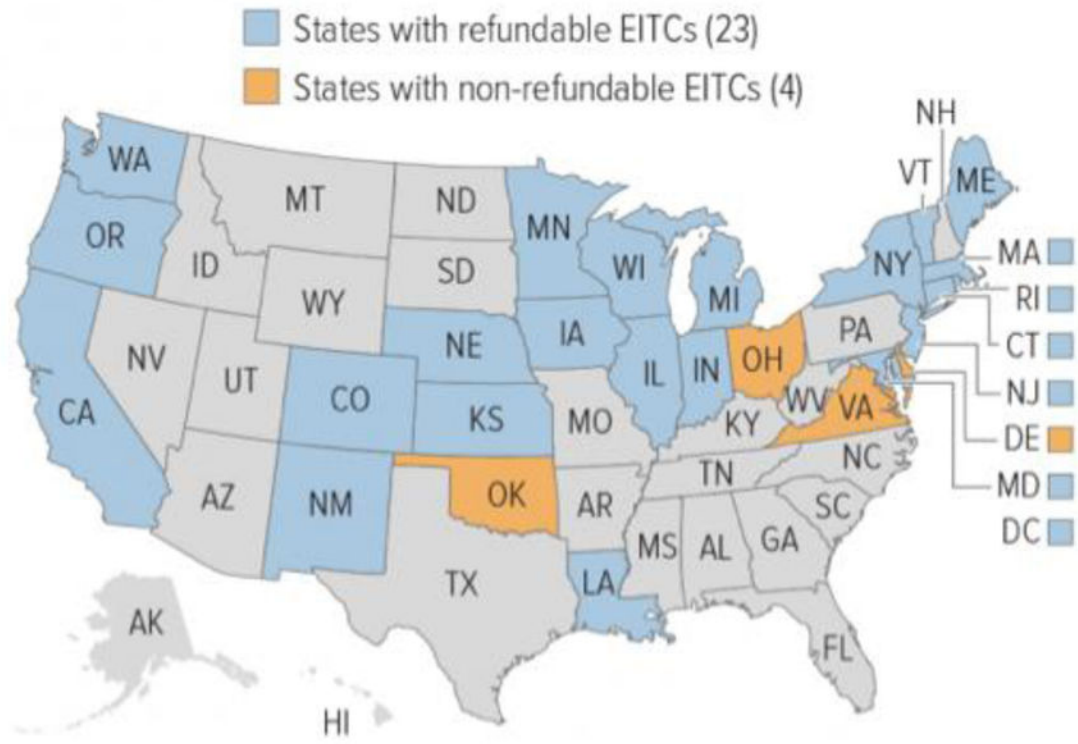
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Twenty-six States and DC Have Enacted EITCs, 2016



Source: CBPP analysis

Fig 3. States with refundable and non-refundable EITCs. Image used with permission from the Center of Budget Policies and Priorities, cbpp.org

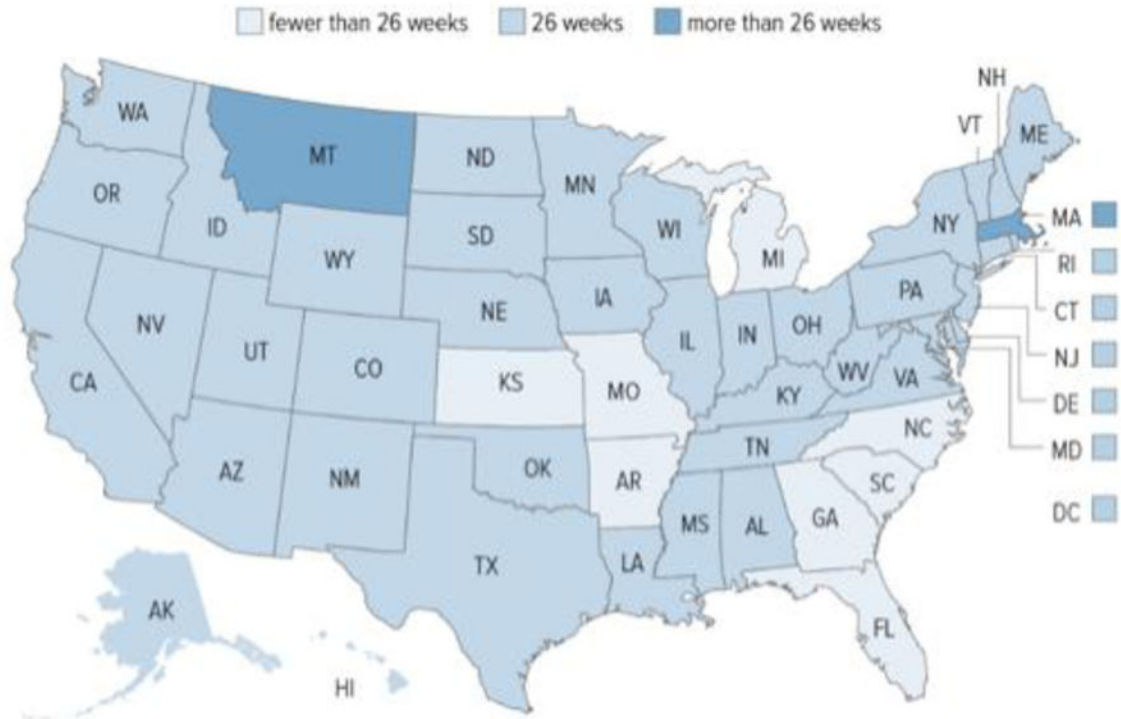
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Maximum Duration of Unemployment Insurance

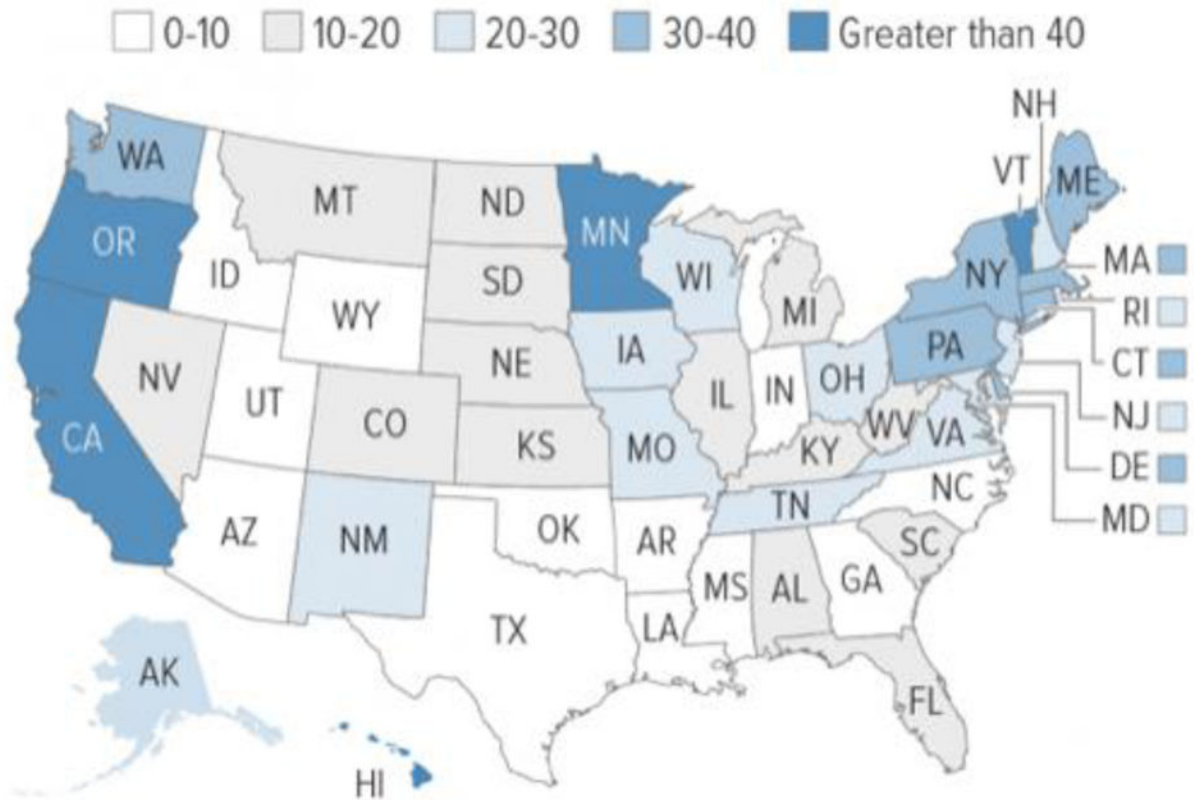


Note: Weeks shown in map are for regular state benefits; no additional weeks of federal benefits are available in any state. The Virgin Islands and Puerto Rico both have 26 weeks of regular unemployment insurance (UI).
Source: Congressional Research Service.

Fig 4. Maximum duration of unemployment insurance in the United States. Image used with permission from the Center of Budget Policies and Priorities, cbpp.org

TANF Provides a Safety Net to a Small Share of Poor Families

Number of families receiving TANF benefits for every 100 families with children in poverty in 2013-14



Note: TANF = Temporary Assistance for Needy Families.

Source: CBPP analysis of poverty data from the Census' Current Population Survey and TANF caseload data collected by CBPP from state agencies.

Fig 5. TANF-Poverty Ratios in the United States. Image used with permission from the Center of Budget Policies and Priorities, cbpp.org

Table 1

Summary of Literature Reviewed in the Current Manuscript

Authors	Title	Economic Security Policy	Population	Main Outcome(s) of Interest	Summary of Significant Findings
Lenhart (2016)	The impact of minimum wages on population health: evidence from 24 OECD countries	Minimum Wage	Full-time workers in 24 countries that had effective minimum wages and partook in Organization for Economic Cooperation and Development (OECD) between 1980 and 2010	All-Cause Mortality, Cause-Specific Mortality (Diabetes, Diseases of the circulatory and digestive systems, stroke, heart attack, and external factors), and Life Expectancy at Birth	A 10% point increase in the Kaitz index reduces all-cause mortality rates per 100,000 individuals by 21.95 (p-value<0.01) and increases life expectancy by 0.44 years (p-value<0.01). Increases in minimum wages reduce cause-specific mortality rates per 100,000 individuals due to diabetes (2.81, p-value<0.01), diseases of the circulatory (14.88, p-value<0.01) and digestive (1.20, p-value<0.05) systems, stroke (9.62, p-value<0.01), heart attack (5.95, p-value<0.01), and external factors (1.79, p-value<0.1).
Tsao et al (2016)	Estimating Potential Reductions in Premature Mortality in New York City From Raising the Minimum Wage to \$15	Minimum Wage	Adults younger than age 65 living in New York City as measured by the Department of Health and Mental Hygiene Vital Statistics data and population estimates for the years 2008–2012	Premature Mortality	Under three scenarios, a rise in the minimum wage to \$15 per hour could reduce premature death by between 8 and 15 per 100,000 individuals. In the most pessimistic scenario, a rise in the minimum wage would result in 2800 fewer premature deaths and in the most optimistic scenario 5500 fewer premature deaths.
Komro et al (2016)	The Effect of an Increased Minimum Wage on Infant Mortality and Birth Weight	Minimum Wage	Census of children ages 0–364 days born in the U.S. for the period of 1980–2011	Low Birth Weight (<2500 grams at birth) and Postneonatal Mortality (28–364 days)	A \$1 increase in the minimum wage above the federal level was associated with a significant 1 to 2 percent decrease in low weight births (crude %change -1.9, CI -3.1, -0.7; adjusted %change -1.1, CI -2.1, -0.1) and a 4 percent decrease in postneonatal mortality (crude %change -4.9, CI -7.3, -2.5; adjusted %change -4.0, CI -6.4, -1.6). In 2014, there would have been 2790 fewer Low Birth Weight births and 518 fewer postneonatal deaths.
Wehby et al (2016)	Effects of the Minimum Wage on Infant Health	Minimum Wage	Census of children born in 1989–2012 to women who have a high school degree or less and are between the ages of 18 to 39 years old at time of pregnancy in the U.S.	Infant Birth Weight, indicator of low birth weight (<2500 grams), and fetal growth (birth weight divided by gestational age)	For mothers without a high school diploma, a 10% increase in the minimum wage relative to the median wage is associated with a 10-gram increase in birth weight; a 0.2 percentage point decrease in low birth weight; and a 0.2 gram increase in fetal growth.
Hoke and Cotti (2015)	Minimum wages and youth binge drinking	Minimum Wage	Children 14–18 years of age engaged in full-time education in the U.S. who participated in the Youth Risk Behavior Survey (YRBS) for the years 1991, 1999, 2001, 2003, 2005, 2007, 2009, and 2011	Binge Drinking in the Past 30 Days (5+ drinks in one sitting)	A \$1 increase in minimum wage is associated with a 9% (IRR: 1.09; p-value=0.018) increase in binge drinking among teenagers. The effect is especially prominent for males (IRR: 1.12; p-value=0.002).

Authors	Title	Economic Security Policy	Population	Main Outcome(s) of Interest	Summary of Significant Findings
Baughman and Duchovny (2016)	State Earned Income Tax Credits and the Production of Child Health: Insurance Coverage, Utilization, and Health Status	EITC	Children born in the years 1992–2006 to mothers with less than a college education who participated in the Child and Young Adult file of the 1979 National Longitudinal Survey of Youth	Insurance Coverage, Healthcare Utilization, BMI, and Mother-Rated Health Status of Children Ages 6–14	An increase in the amount of the EITC was associated with improvements in the mother-rated health status of children ages 6–14 years old. Specifically, a \$100 increase in the median simulated value of the state EITC is associated with a 35 percent decrease in the probability of reporting of fair or poor health relative to the group mean (p-value 0.05), a 5 percent increase in the probability of reporting excellent health relative to the group mean (p-value 0.1). The use of private health insurance increased by 6 percent relative to the group mean (p-value 0.1) but public health insurance use decreased which resulted in no net impact to overall percentage insured for children ages 6–14 years old.
Hamad and Rehkopf (2016)	Poverty and Child Development: A Longitudinal Study of the Impact of the Earned Income Tax Credit	EITC	Women surveyed in the 1979 National Longitudinal Survey of Youth and their children born during 1986–2000	Children's (ages 4–14) Scores on the Behavioral Problems Index (BPI) and Children's (ages 0–14) Scores on the Home Observation Measurement of the Environment Inventory (HOME)	Higher incomes (per \$1,000, $\beta = -0.47$; p-value=0.01) and EITC benefits (per \$1,000, $\beta = -0.57$; p-value=0.04) are associated with a small but significant improvement in short-term measures of children's problem behaviors.
Hamad and Rehkopf (2015)	Poverty, Pregnancy, and Birth Outcomes: A Study of the Earned Income Tax Credit	EITC	Women surveyed in the 1979 National Longitudinal Survey of Youth and their children born during 1986–2000	Utilization of Prenatal and Postnatal Care, Use of Alcohol and Tobacco During Pregnancy, Term Birth, Birthweight, and Breast-Feeding Status	EITC payment size for which the mother was eligible in the prior year marginally associated with subsequent year indicators of perinatal health including increased birthweight ($\beta = 65.1$ grams per \$1,000; p-value=0.05), likelihood of breastfeeding ($\beta = 0.042$ per \$1,000; p-value=0.08), and likelihood of going to term ($\beta = 0.032$ per \$1,000; p-value=0.06).
Brueckner et al (2013)	Income Gains and Very Low-Weight Birth among Low-Income Black Mothers in California	EITC	Census of children born to non-Hispanic black women in California for the period of 1989 through 1997	Very Low Birth Weight (< 1500 grams)	Two months after EITC disbursement, there was a 37% increase (p-value<0.001) in the odds of very low birth weight among infants born to low-income African American women above mean levels.
Hoynes et al (2015)	Income, the Earned Income Tax Credit, and Infant Health	EITC	Census data of births in the U.S. for the period of 1983–1999 to single mothers age 18 and older	Birth Weight and Low Birth Weight (<2,500 grams)	EITC expansion was associated with a decrease in the incidence of low birth weight and increases in mean birth weight. Specifically, a \$1,000 treatment-on-the-treated leads to a 2 to 3 percent decline in low birth weight.
Boyd-Swan et al (2016)	The earned income tax credit, mental health, and happiness	EITC	Women ages 16–55 who have no more than a high school degree who participated in the National Survey of Families and Households in the years 1987 and 1988 (Wave 1) and 1992 and 1994 (Wave 2)	Center for Epidemiological Studies Depression (CES-D) Scale and Subjective Well-Being	Compared to women without children, married mothers report a significant 4.4% increase (p-value=0.05) in happiness, 10.1% (p-values=0.05) increase in measures of self-esteem and a 15.7% decrease (p-value=0.05) in depression after the EITC expansion.
Rehkopf et al (2014)	The short-term impacts of Earned Income Tax Credit	EITC	Individuals living in the Western and Southern United States between the	30 Outcomes of Physical Health (relating to diet, food security, health behaviors, cardiovascular	There were 13 significant outcomes of physical health for women who qualified for the EITC during the treatment months; nine of which were in the

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	disbursement on health		ages of 21 and 50 years old who participated in the U.S. Third National Health and Nutrition Examination Survey (NHANES III) for the years 1988–94	biomarkers, metabolic biomarkers and infection and immunity)	direction associated with better health [meat (Z = -0.382, 95% CI = -0.615, -0.150), not enough food (OR = 0.968, 0.954–0.985), not enough money for food (OR = 0.970, 0.954–0.990), smoking (OR = 0.982, 0.974–0.989), not trying to lose weight (OR = 0.977, 0.964–0.990), marijuana use (OR = 0.997, 0.995–0.998), HDL cholesterol (Z = -0.386, 95% CI = -0.681, -0.092), lymphocytes (Z = -0.342, 95% CI = -0.506, -0.178) and colds (OR = 0.990, 0.983–0.997)] and four were associated with poorer health [sodium (Z = 0.330, 95% CI = 0.120, 0.540), pulse rate (Z = 0.343, 95% CI = 0.074, 0.611), LDL cholesterol (Z = 0.238, 95% CI = 0.038, 0.437) and triglycerides (Z = 0.218, 95% CI = 0.020, 0.417)]. For men who qualified for the EITC during the treatment months, there were eight significant outcomes of physical health; seven were associated with better health (fruit (Z = -0.396, 95% CI = -0.631, -0.162), dairy (Z = -0.326, 95% CI = -0.633, -0.019), not enough food (OR = 0.973, 0.954–0.991), not enough money for food (OR = 0.972, 0.954–0.991), not trying to lose weight (OR = 0.974, 0.964–0.984), cotinine (Z = -0.314, 95% CI = -0.531, -0.097), and marijuana (OR = 0.994, 0.992–0.996)] and one was associated with poorer health [saturated fat (Z = 0.393, 95% CI = 0.116, 0.670)].
Tefft (2011)	Insights on unemployment, unemployment insurance, and mental health	UI	Users of the Google search site for the period of 2004–2009	Google searches for the terms “depression” and “anxiety”	There was a negative association between initial unemployment insurance claims and online search indexes for both depression (-0.27, p < 0.01) and anxiety (-0.33, p < 0.01).
Cylus et al (2015)	Health Effects of Unemployment Benefit Program Generosity	UI	Heads of household aged 18 to 65 who participated in the Panel Study of Income Dynamics (PSID) for the period of 1984–2009	Self-Reported Health Status	More generous unemployment benefits were associated with a lower likelihood of self-reported poor health among unemployed men (b = -0.124; 95% CI = -0.197, -0.0523). A 10% increase in benefits for the unemployed reduces the risk of poor health by 1.3% points.
Wang (2015)	TANF coverage, state TANF requirement stringencies, and child well-being	TANF	Children aged 0 to 15 at baseline who were not covered by TANF in the 12 months before baseline and were U.S. citizens whose family participated in the Survey of Income and Program Participation (SIPP) 2004 and 2008 panels	Child Well-Being (characterized by four dimensions of cognitive stimulation, family interactions, family stress and educational outcomes)	Overall, TANF receipt was associated with a 0.29 increase (p < 0.001) in number of breakfasts shared between guardians and children per week, 51% increase (95% CI = 1.17, 1.92) in parents' expectation that the child will attend college compared to non-TANF children, and 42% lower likelihood to repeat a grade (95% CI = 0.38, 0.90).
Chyi and Ozturk (2013)	The Effects of Single Mothers' Welfare Use and Employment Decisions on	TANF and AFDC	Children born to mothers with at most 12 years of schooling and who have been single for at least 1 year during the first 5 years	Math Peabody Individual Achievement Test	For children of average innate ability, there was a small increase in Math PIAT scores for each quarter of a mother's welfare use (3.9; p-value = 0.01) or work (0.7; p-value = 0.01). For a child with the mean level of innate ability and a mother who works and

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Baltagi and Yen (2014)	Children's Cognitive Development Welfare Reform and Children's Health	TANF	of their children's life and who participated in the Children of National Longitudinal Survey of Youth 1979 Cohort Children ages 0-18 born to parents with at most a high school degree who participated in the Survey of Income and Program Participation (SIPP) for the period of 1994-2005	Three Measures of Children's Health: Health Status, Doctor Consultations and Number of Nights in the Hospital	receives welfare for 20 quarters, the child's Math PIAT scores increases by 8.2 points (p-value=0.01) which is the equivalent of an increase of 55% of the standard deviation of the test score. Children with the lowest innate ability benefited the most from a combination of welfare use and employment (12.536; p-value=0.01). Overall, the authors found that implementation of TANF was not related to child health status or doctor consultations, but was associated with an increase of 0.31 nights spent in the hospital (p-value=0.01). With age-group interactions, the number of nights spent in the hospitals increases by .54 nights (p-value=0.01) and time of doctor consultations becomes significant and the number of doctor's consultations increases by 1.114 (p-value=0.01).
Basu et al (2016)	Health Behaviors, Mental Health, and Health Care Utilization Among Single Mothers After Welfare Reforms in the 1990s	TANF	Women aged 18-64 years old in 1997 who participated in the Behavioral Risk Factor Surveillance System for the period of 1993-2012	Metrics associated with future morbidity and mortality, including: Tobacco smoking, binge alcohol consumption, days per month of self-rated good mental health, access to a regular doctor/clinic, inability to get medical care because of cost, routine Pap test for cervical cancer screening, and routine mammography for breast cancer screening	Compared to married mothers, single non-mothers and married non-mothers, welfare reforms appear to be related to poor health behaviors among single mothers including: an absolute 4.0 percentage point increase (95% CI: 0.9, 7.0) in the likelihood of binge drinking (baseline probability of 33%), 2.4 percentage point decrease (95% CI: 0.1, 4.8) in probability of being able to afford medical care (baseline probability of 80%), a 0.8 percentage point decrease (95% CI: 0.6, 2.3) in the probability of cervical cancer screening (baseline probability 90%), and a 0.8 percentage point decrease (95% CI: -2.8, 1.3) in the probability of breast cancer screening (baseline probability of 38%).
Muennig et al (2015)	More Money, Fewer Lives: The Cost Effectiveness of Welfare Reform in the United States	TANF and AFDC	Eligible adult women (not their children) who enroll in welfare (either TANF or AFDC depending on the model arm) at age 19 and who participated in the Connecticut Jobs First and the Florida Transition Program in the mid-1990s through December 2011	Mortality Risk and Economic Cost of TANF	AFDC is costlier than TANF, but would bring an additional 0.44 years of life. The resulting incremental cost effectiveness of AFDC relative to TANF is therefore approximately \$64,000 per life-year saved