

Do Earned-Income Tax Credits Affect the Health of Adults?

Answer: While still evolving, existing evidence suggests earned income tax credits (EITCs) may be associated with improvements in mortality, general health status, healthy behaviors, and some measures of dietary, psychological, cardiovascular, and metabolic health among adults. The only available systematic review on the topic, published in 2013, suggested that EITCs in the United States have no major effect on the health of adults except for a possible reduction in tobacco use among less well-educated white women. However, this systematic review was based on only five studies. Our conclusion that EITCs may improve the health of adults is based on the growing number of methodologically strong research studies published since the systematic review, though some limitations in the available evidence base remain.

Policy context

AcademyHealth undertook this review from the perspective of a policymaker trying to understand whether earned-income tax credits (EITCs) affect the health of adults. EITCs subsidize low- and moderate-income working families in the United States with a “refundable” credit equal to a fixed percentage of earnings from the first dollar earned. The credit, which rises, plateaus, and then phases out as income rises, heavily favors families with children over those without. First introduced in 1975, the U.S. federal EITC has been expanded by Congress several times, most substantially in 1990. As of 2016, 26 states have enacted their own EITCs as well. Theory suggests EITCs may improve health in two ways: 1) by increasing income (e.g. which in turn leads to increased food security, access to care, ability to engage in healthy behaviors, etc.), and/or 2) by reducing the harms (e.g. increased stress) associated with being unemployed. Alternatively, they may negatively affect health by disrupting work-life balance or resulting in stressful employment.^{1,2} A significant body of evidence (discussed in Appendix 2) generally supports the conclusion that the EITC improves children’s health and educational attainment.⁷⁻¹² Because the number of studies examining the health effects of the EITC among adults was small in the past but is now growing, this review focuses on adults.

Supporting evidence

- The 2013 systematic review¹ examining the health impacts of EITCs (based on studies of the U.S. federal credit) found no evidence that EITCs have an impact on self-reported general health status, mental health status, psychological distress, obesity, or being overweight. Evidence about the impact of EITCs on tobacco use was mixed, with one study reporting no impact after five years, one study finding a moderate reduction after one year, and one study finding a differential impact between less well-educated African American women (where there was no effect) and similarly less well-educated European American women (where there was a large reduction in tobacco use). However, because the authors of the systematic review found only five studies that met their criteria for inclusion in the review, they could not rule out the possibility that EITCs actually do have a more substantial impact on health.
- The growing body of research studies published after the systematic review²⁻⁶ generally – but not consistently – suggest that EITCs may be associated with some markers of improved health, though the effects are not large. These potential improvements include better self-reported general health, lower rates of depression, and reduced mortality (both overall and quality-adjusted life). Research also suggests an association between EITCs and higher rates of specific health behaviors, better diet and food security, and some measures of better cardiovascular and metabolic health.

Limitations

- Evidence in the 2013 systematic review¹ was considered weak because of the small number of studies that met the review’s stringent methodological criteria and the fact that findings come from observational studies rather than randomized experiments.
- Because randomized, experimental studies of EITCs are infeasible, it is possible that indicators of better health found in the primary research studies published since the 2013 systematic review were actually caused by unmeasured factors, rather than the EITCs themselves. In addition, these studies have not been subjected to a formal systematic review.

AcademyHealth conducted this rapid review over a two-week period using an established protocol that emphasizes timeliness, efficiency, and responsiveness to policymakers’ needs. It synthesizes existing peer-reviewed systematic reviews and peer-reviewed primary research studies published since the most recent systematic review. A primary analyst undertook and revised the review. Two additional AcademyHealth analysts and an external tax policy expert provided input on the initial findings and draft report. Appendix 3 lists the search terms and databases used in this rapid review.

Appendix 1: Definition of Terms

Earned Income Tax Credit (EITC) — The EITC is a U.S. federal policy designed to incentivize work by reducing income taxes owed. It provides a credit to low- and moderate-income working taxpayers. During the 2016 tax year, it was available to taxpayers with incomes below a threshold that ranged from \$39,300 to \$53,500, depending on marital status and number of children. Taxpayers with no children received the credit in 2016 if their incomes were below \$14,900 if single and \$20,400 for married couples. The amount of the credit increases with income until it reaches a plateau, after which it phases out. In 2015, the average EITC was \$3,186 for a family with children and \$293 for families without children. The EITC is “refundable,” meaning that any credit in excess of taxes owed is paid back to the taxpayer.¹³

In-work tax credit — This is a generic term for policies that offset taxes owed in order to encourage and reward work. The EITC is one example of an in-work tax credit. Although a number of countries have in-work tax credits, all of the evidence included in this review comes from research about federal and state EITCs in the United States.¹⁴

Appendix 2: Summary of Evidence

Impact of EITCs on the Health of Adults

The literature on EITCs identified through this review includes one systematic review and subsequent primary research studies that examine the health impacts for adults, mainly mothers. While the systematic review found little evidence that the EITC leads to better health among adults, the more recent studies suggest there may be a largely positive impact.

Systematic Review. Our search found one systematic review published in 2013 by the [Cochrane Collaboration](#) that examined the evidence on the impact of in-work tax credits on the health of adults.¹ At the time, the authors deemed the available body of evidence to be “weak,” in part because it came from observational studies (mainly based on survey data) with significant risks of bias, but mainly because there were so few studies on the health impacts for adults that met the authors’ predetermined, methodologically-stringent inclusion criteria. From the five studies included in the review, the authors concluded that, as of 2012, there was:

- No evidence reporting the impact of EITCs on diagnosed mental illnesses or alcohol use.
- Weak evidence that EITCs have no effect on self-rated general health status, mental health status, and psychological distress five years after policy implementation.
- Weak evidence that EITCs have no effect on being overweight or obese eight years after policy implementation.
- Mixed, weak evidence on the impact of EITCs on tobacco use. One study reported no effect five years after implementation of the U.S. federal EITC, while another study found a moderate reduction one year after implementation. One study found a differential impact of the policy among population subgroups, with no effect on tobacco use among African American women with lower levels of education, but a large reduction among European American women with lower levels of education.

Research Studies Published Since the Systematic Review. Since publication of the systematic review, the question of whether EITCs affect the health of adults has been a topic of growing interest to researchers. This more recent body of research largely (but not consistently) suggests that EITCs may actually be associated with improved health among adults:

- A 2013 study² found better mental health for mothers following the 1990 expansion of the U.S. federal EITC, although the impact was larger for married mothers than unmarried mothers. For example, scores on the CES-D scale for depression improved 15 percent for married mothers versus 4 percent for unmarried mothers.
- A 2014 study³ using the Current Population Survey found that the combined effect of the U.S. federal EITC and a 1991-1993 tax credit for the purchase of health insurance was associated with a 4.7 percentage point increase in private health insurance coverage among working single mothers with a high school education or less. The authors calculated that only a fourth of that increase (1.1 percentage points) was attributable to the EITC, but they have low confidence in this estimate because of unrealistic assumptions it requires. The actual impact could be higher or lower.

- A 2014 study⁵ examined the short-term impacts of the U.S. federal EITC by comparing 30 health behaviors and outcomes during the three months when families usually receive lump sum income from the EITC (February through April) to the same behaviors and outcomes during the rest of the year. Of the 13 outcomes among women statistically associated with receiving EITC income, nine were in the direction of better health, and four were in the direction of worse health. Of the eight outcomes among men statistically associated with receiving EITC income, seven were in the direction of better health and one was not.
- A 2015 study⁶ found that being eligible for the 1990 increase in U.S. federal EITC benefits increased the likelihood of self-reporting “very good” or “excellent” health by 3.88 percentage points, which translates to an 8.6 percent increase in the probability of reported health status falling into one of these two categories post-expansion. This increases to 5.02 percentage points when allowing for a one-year lag since the benefits increase (11.1 percent increase over pre-expansion rates) and 6.56 percentage points following a three-year lag (14.3 percent increase over pre-expansion rates).
- A 2016 study⁴ found that, on average, state age-adjusted mortality rates decreased an additional 3.8 percentage points per year following implementation of state-level EITCs. The authors found similar results for quality-adjusted life expectancy.

However, there are a few limitations to these recent studies:

- All studies used “an intention to treat” approach in which impacts were averaged across all individuals in the study eligible to receive EITCs since it was not possible to identify actual EITCs claimed. This suggests that for any individual adult, the actual impact may be larger or smaller than those estimated in the studies.
- While all of the studies attempt to compare time trends in both a treatment and control group through methodologically strong difference-in-difference approaches, they all rely on household survey or administrative data. Among other potential biases, it is possible that the researchers have not controlled for all potential factors that could affect health outcomes among study participants. While randomized experimental studies of the EITC are infeasible, future research that leverages natural experiments (e.g. comparisons of different EITC policies among similar states over time) could provide more definitive evidence.

Impact of EITCs on the Health of Children

Although this review focuses on adults, there is a larger body of research focused on the impact of EITCs on the health of children. Results suggest an association between EITCs and improved children’s health, though there are a few contradictory findings. Among recent research:

- At least one study suggests that income from EITCs may improve perinatal health,⁷ and two other studies indicate a reduction in the incidence of low birth weight, and an increase in mean birth weight.^{8,9}
- Another study confirms this finding for state-level EITCs, but notes that mixed results for mothers of different ages and for the potential impact of other antipoverty programs suggest the relationship is complex.¹⁰
- A 2016 study concluded that EITCs are associated with increases in private health insurance coverage among children ages 6-14, simultaneous decreases in public coverage, and improvements in children’s health status. The study found no significant impact on health care utilization.¹¹
- Another 2016 study found that receipt of EITC income was associated with significant improvements in home environment quality for children of unmarried mothers in general, a lower likelihood of accidents among married white mothers, and improved mother-reported child health status among unmarried black and Hispanic mothers and married white mothers.
- Contradicting these findings, a 2013 study suggests that EITCs may actually be associated with an increase in the likelihood of having a very low-weight birth among low-income, non-Hispanic mothers.¹²

In addition to studies focused on direct health impacts of EITCs for children, existing research suggests the tax credit may improve factors considered to be social determinants of health, including educational outcomes, children’s home environment, and life-time earnings potential.¹⁵⁻¹⁷ As with studies of EITCs’ impacts among adults, this research relies on surveys and other observational data, raising the possibility that unmeasured factors could explain at least some of the observed improvements in health and education among children.

Appendix 3: Search Terms and Databases

The following list shows the basic Boolean search term strategy used for the review. Searches were modified based on search functions within each database used.

Search term(s)		Search term(s)
("Earned income tax credit" or "EITC")	AND	health or well-being
"In-work tax credit"		mortality
"Tax credit"		
Tax		
Tax*		

Databases: Health Systems Evidence, the Cochrane Library, Campbell Collaboration Library, EPPI-Centre Reviews, PubMed, Web of Science Core Collection, ProQuest Social Science Database, and EBSCO Social Sciences Full Text.

Dates: All databases searched for literature from the period 1/1/2012 through 10/24/2016 except for Health Systems Evidence, Cochrane Library, and Campbell Collaboration Library, for which no date restriction was applied.

Appendix 4: Evidence included in this rapid review

Table 4a: Systematic review

Author and date	Focus of review	Methods	Relevant findings	Limitations and quality of the evidence as reported by the author	AMSTAR Quality Rating for Systematic Review ¹⁸
Pega <i>et al.</i> , 2013 ¹	Health impacts of family in-work tax credits on health outcomes of adults 18-64 years.	<p>Date range: 1/1/1980 — 7/12/2012</p> <p>Inclusion criteria:</p> <p>Types of interventions: Tax credit that was implemented as part of a welfare-to-work policy, received by families with at least one dependent child, received because of adults currently working, and were not time limited.</p> <p>Types of studies: Randomized and quasi-randomized controlled trials; cohort; controlled before-and-after; and interrupted time series designs. Control group received no in-work credit for families or a significantly smaller credit than intervention group.</p> <p>Exclusion criteria: Studies that did not specifically examine in-work tax credits for families or examined tax credits in combination with other publicly funded financial credits; studies lacking empirical data; studies with participants who were not working-age adults; studies in which in-work tax credit was the instrumental variable, but no impact of the credit estimated.</p>	<p>Studies included: Five studies total. All observational; all studied federal and/or state EITCs in the United States:</p> <ul style="list-style-type: none"> Four interrupted time series studies, two of which used difference-in-differences methods and two of which used triple difference methods with fixed effects. One controlled before-and-after study using triple difference methods with fixed effects. <p>Effect on health outcomes: The review found weak evidence that the EITC has no effect on the health status of adults, with the exception of mixed evidence on the impact of the EITC on tobacco use in women, with some studies finding reduced smoking rates. No adverse effects of the EITC were reported.</p> <p>Primary outcomes:</p> <p>(1) No included studies examined mental illness or alcohol use.</p> <p>(2) Included studies found weak evidence of no impact of the EITC on self-rated general health, mental health status, and psychological distress five years after implementation, and no impact on being overweight or obese eight years after implementation.</p> <p>(3) Evidence on tobacco use was mixed. One study found no effect of the EITC on tobacco use five years after implementation, another study found a moderate reduction one year after implementation, and yet another study found large reductions in tobacco use among low-educated European American women but no effect among low-educated African American women two years after implementation.</p>	<p>Risk of bias in all five studies:</p> <p>Selection bias: Risk unclear in four studies due to lack of information provided; high risk in one study.</p> <p>Bias from misclassification of exposure: High risk in all five studies due to use of proxy such as eligibility for increased EITC rather than actual participation.</p> <p>Bias from misclassification of outcome: Reviewers conclude that self-reported outcomes create some risk in all included studies, but that it is generally low. Use of tool to correct for social desirability bias in studies examining obesity and smoking creates high risk of performance and detection bias in one study.</p> <p>Attrition bias: Risk unclear in three studies that did not report response rates before and after the intervention; high risk in the other two studies.</p>	11/11

Author and date	Focus of review	Methods	Relevant findings	Limitations and quality of the evidence as reported by the author	AMSTAR Quality Rating for Systematic Review ¹⁸
		<p>Quality or strength of evidence assessment: Authors deem the body of evidence to be of low quality due to the small number of (observational) studies and high risks of bias in all five studies.</p>	<p>Secondary outcomes:</p> <p>(1) One study found the EITC had no effect on the number of bad physical health days or risky biomarkers for inflammation, cardiovascular disease, or metabolic conditions eight years after implementation.</p> <p>(2) One study found a large positive effect on income from wages or salary one year after EITC implementation.</p> <p>(3) The EITC's impacts on employment were mixed. Two studies found no effect on employment two and five years after implementation, while two studies found a moderate increase five and eight years after implementation, and one study found a large increase in employment due to the EITC one year after implementation.</p>	<p>Bias from unmeasured/unadjusted confounding variable: High risk due to confounding by income (four studies) and employment (five studies).</p> <p>Bias from insufficient control for time trends: High risk in the four interrupted time series studies.</p>	

Table 4b: Research studies published since 2012

Author, date, and title	Methods	Study population	Focus of study/Key features of intervention	Relevant findings	Limitations in the study as reported by the author
Boyd-Swan <i>et al.</i> , 2013 ²	<p>Data from the National Survey of Families and Households administered in two waves: pre-EITC expansions (1987-8) and post (1992-4).</p> <p>Difference-in-differences framework measuring EITC "intent-to-treat" (i.e. EITC-eligible, not necessarily participating).</p>	Adults identified in national household survey.	Impact of the federal EITC expansion in the Omnibus Budget Reconciliation Act (OBRA) of 1990 on self-reported mental health and subjective well-being as means for understanding income-health gradient.	<p>Unmarried mothers were 8.4 percent more likely to be working following EITC expansion, corresponding to a 17 percent rise in employment among this population.</p> <p>Low-skilled, married mothers demonstrated less depression (lower scores on the CES-D Depression Scale), higher levels of happiness, and a higher likelihood of feeling efficacious following EITC expansion. The study found</p>	<p>By measuring those eligible rather than claiming the EITC, the intention-to-treat approach captures impact averaged over those eligible. It does not measure impact on an individual.</p> <p>Attributing causality in a difference-in-differences approach assumes all potential confounding factors over time and between treatment and control groups</p>

Author, date, and title	Methods	Study population	Focus of study/Key features of intervention	Relevant findings	Limitations in the study as reported by the author
Cebi and Woodbury, 2014 ³	<p>Data from the Current Population Survey, 1985-1993.</p> <p>Use of a difference-in-differences framework exploiting the addition of the 1991-93 Health Insurance Tax Credit (HITC) and increases in EITC in 1990. Triple difference approach used to disaggregate combined EITC/HITC impact on rates of private health insurance coverage.</p> <p>Uses “intention-to-treat” approach focusing on EITC/HITC eligible individuals.</p>	<p>Working single mothers with a high school education or less. Control group is working single women with a high school education or less, but no children.</p>	<p>Estimates combined and disaggregated the impact of the EITC and the HITC on private health insurance coverage among working single mothers with a high school education or less.</p>	<p>much less impact among unmarried mothers, e.g. CES-D scores for married mothers improved 15 percent versus 4 percent for unmarried mothers.</p> <p>The combined HITC and EITC in 1991-1993 was associated with a 4.7 percentage point increase in private health insurance coverage among working single mothers with a high school education or less.</p> <p>The triple difference estimate suggests the EITC was responsible for one-quarter of the total impact (1.1 percentage points) and the HITC was responsible for the remaining three-quarters (3.6 percentage points).</p>	<p>have been controlled for, which may not be true.</p> <p>By measuring those eligible rather than those claiming the EITC, the intention-to-treat approach captures impact averaged over those eligible. It does not measure impact on an individual.</p> <p>Attributing causality in a difference-in-differences approach assumes all potential confounding factors over time and between treatment and control groups have been controlled for, which may not be true.</p> <p>The triple difference approach to disaggregate EITC and HITC impacts requires strong, unrealistic assumptions, calling in to question the accuracy of the estimate of the EITC-only impact.</p>
Muennig <i>et al.</i> , 2016 ⁴	<p>Interrupted time-series difference-in-differences analysis of state-level mortality rates and quality-adjusted life expectancy using the EuroQol five dimensions questionnaire (EQ-5D), 1980-2011.</p> <p>Annual state-level, age-adjusted mortality data from the Compressed Mortality File, 1980-</p>	<p>Populations in states with their own supplemental EITCs.</p>	<p>The study estimates the impact of state-level EITCs that supplement the federal credit on mortality and health-related quality of life (HRQL) scores as one step in the study’s ultimate calculation of cost-effectiveness ratios of EITCs.</p>	<p>State age-adjusted mortality decreased an additional 3.8 percentage points per year following implementation of a state EITC. The study found similar results for quality-adjusted life expectancy.</p>	<p>The study measured the impact of the EITC at the level of the entire population within a state rather than for an individual.</p> <p>The ability of quasi-experimental difference-in-differences designs to attribute causality is dependent on controlling for all potentially confounding factors, which may not have occurred.</p>

Author, date, and title	Methods	Study population	Focus of study/Key features of intervention	Relevant findings	Limitations in the study as reported by the author
	<p>2011; data for calculated health-related quality of life with the EQ-5D from state-level Behavioral Risk Factor Surveillance System (BRFSS), 1993-2011.</p>				
<p>Rehkopf <i>et al.</i>, 2014⁵</p>	<p>Difference-in-differences approach utilizing the fact that EITC recipients receive lump sum payments in February through April. The treatment group was EITC-eligible individuals surveyed February through April. The control group was EITC-eligible individuals surveyed May through January.</p> <p>Data from the National Health and Nutrition Examination Survey, 1988-94. Examined 30 health outcomes expected to fluctuate over a one-month period or less. Outcomes include diet-related measures, health behaviors, cardiovascular health, metabolism, and infection/immunity.</p> <p>Uses “intention-to-treat” approach focusing on EITC eligible individuals.</p>	<p>Adults 21-50 years old who qualify for the federal EITC.</p>	<p>Short term impacts of the EITC on health behaviors in the months following receipt of EITC income.</p>	<p>Of the 13 outcomes among women associated with receiving EITC income, nine were in the direction of better health (less meat consumption, sufficient food consumption, sufficient money for food, less smoking, trying to lose weight, less marijuana use, higher HDL cholesterol, higher lymphocytes, and fewer colds), and four were in the direction of worse health (more sodium consumption, less healthy pulse rate, higher LDL cholesterol, and higher triglycerides).</p> <p>Of the eight outcomes among men associated with receiving EITC income, seven were in the direction of better health (more fruit consumption, less dairy consumption, sufficient food consumption, sufficient money for food, trying to lose weight, less nicotine and marijuana consumption) and one was not (more saturated fat intake).</p> <p>Effect sizes were small, with impacts on smoking rates, the probability of trying to lose weight, and food insecurity between 2 and 3 percent, and differences in metabolic and diet factors about one-third of a standard deviation.</p>	<p>By measuring those eligible rather than those claiming the EITC, the intention-to-treat approach captures impact averaged over those eligible. It does not measure impact on an individual.</p> <p>The ability of quasi-experimental difference-in-differences designs to attribute causality is dependent on controlling for all potentially confounding factors, which may not have occurred.</p> <p>Results may not be generalizable to the Midwest and Northeast regions of the United States because of lack of year-round data collection in those regions.</p> <p>Sample size of “treated” individuals (i.e. those deemed eligible for the EITC) was small – 167 women and 111 men.</p> <p>Observed short-term effects may not persist over time.</p>

Author, date, and title	Methods	Study population	Focus of study/Key features of intervention	Relevant findings	Limitations in the study as reported by the author
Lenhart, 2015 ⁶	<p>Difference-in-differences and triple difference (DDD) approach using Panel Data of Income Dynamics data, 1990-2003. DDD tests the assumption that time trends in the treatment and control groups would be the same absent the policy change.</p> <p>Uses intention-to-treat approach with predicted EITC benefit amounts.</p>	<p>Heads of households potentially eligible for EITC (i.e. with children).</p>	<p>Uses the fact that the 1993 legislation increased EITC benefits for households with at least two children but gave no increase to one-child families as an exogenous variable to estimate the relationship between income and health.</p>	<p>Being eligible for increased EITC benefits increased the likelihood of excellent or very good self-reported health by 3.88 percentage points, which is significant at the .05 level. This finding translates to an 8.6 percent increase in the probability of reporting health in one of the two categories.</p> <p>When measured with a lag of one or three years, self-reported excellent/very good health status increases by 5.02 percentage points (one-year lag) and 6.56 percentage points (three-year lag) compared to the pre-treatment period. Both lagged findings are significant at the .01 level and translate to 11.1 percent (one-year lag) and 14.3 percent (three-year lag) increases in the probability of self-reporting being in the top two health categories compared to the pre-treatment period.</p>	<p>By measuring those eligible rather than those claiming the EITC, the intention-to-treat approach captures impact averaged over those eligible. It does not measure impact on an individual.</p> <p>Attributing causality in a difference-in-differences approach assumes all potential confounding factors over time and between treatment and control groups have been controlled for, though DDD analysis in this study suggests similar trends in the two groups absent the policy trend.</p>

Endnotes

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18. Authors of this Rapid Evidence Review calculated this AMSTAR score using “A Measurement Tool to Assess Systematic Reviews” AMSTAR Checklist available at http://amstar.ca/Amstar_Checklist.php.