

**Examining the Effects of Timing of Earned Income Tax Credit on Preterm Births in California:
Can a Natural Experiment Inform the Best Points of Intervention?**

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Background

Nearly 10 percent of births in the US occur before the 37th week of gestation, and are considered preterm. Preterm births impact the health of mothers and infants, and are the leading cause of infant mortality and morbidity. As babies born preterm grow, they are at increased risk for physical impairments, neurodevelopmental disabilities, poor cognitive functioning, educational problems and lower lifetime earnings. Socioeconomic and racial disparities in preterm birth are well established, with non-Hispanic Black women and low-income women bearing much of the burden. While much of the etiology of preterm birth remains unknown, maternal psychosocial stress is an established risk factor. Research suggests that this relationship between SES and preterm birth may be the result of economic insecurity. Increasing attention is therefore being paid to the potential of social policy to improve births outcomes through reductions in economic stress.

The earned income tax credit (EITC), is the largest U.S. poverty alleviation program, providing tax refunds to low-income working families. There is a growing body of evidence that EITC and income supplements improve perinatal health. Although one study in California found decreased birthweight with EITC, most work has shown improvements in birth outcomes, including birthweight, gestational age, and decreases in maternal smoking. One prior study found that EITC receipt earlier in pregnancy led to improved behaviors such as prenatal care

initiation. We extend this work to examine if there is variation in preterm birth as a result of the trimester of pregnancy in which EITC was received, using a quasi-experimental design.

Differences by trimester may reveal information about the stress pathway and identify points of intervention for social policy.

Methods

Our study population was comprised of births from the California Birth Cohort, 2005-2011 (N=3,749,946 births). EITC credits are primarily administered in February, thus we assigned pregnancies to trimester of EITC exposure based using due date and gestational age. Conceptions in December, January or February were classified as first trimester and those in September, October and November as second trimester during EITC exposure. Those conceived in May, June, July or August were classified as third trimester, provided they were delivered in March or later. Other pregnancies were classified as preconception if the woman conceived in February or earlier. Our dataset does not include information about receipt of EITC. Instead, we developed an 'EITC eligible' population based on other available measures of SES, supported in the literature. Mothers with less than a high school education and on the Women Infant and Children (WIC) program would likely have incomes within the guidelines to receive the EITC. Further we speculate that those in the WIC program likely are more directly connected to government programs and therefore are more likely receive an EITC refund. First pregnancies to women under 25 were classified as not EITC eligible.

We use difference-in-difference models to assess the effect of trimester of EITC exposure on preterm birth. Models control for potential confounding variables: parity, age,

race/ethnicity, and year of birth. We additionally examined if the relationship differed by race/ethnicity in stratified models.

Results

Over 20 percent of the births in California between 2005-2011 were classified as EITC eligible (meaning mother's education 12 years or above and WIC recipients). The DID models of EITC receipt by trimester revealed an increased risk of preterm birth in each trimester relative to the preconception period. First trimester ($\beta=0.004$, 95% CI(.002-.006)) second trimester ($\beta=0.004$, 95% CI (.002, 006)) and third trimester ($\beta=0.005$, 95% CI(.003, .007)) exposure compared to the preconception period were each associated with elevated risk of preterm birth in adjusted models. Results differed by racial/ethnic group. Exposure in the second ($\beta=0.02$, 95% CI (0.095, 0.022) and third trimester ($\beta=0.014$, 95%CI (0.005, 0.023)) was more strongly associated with risk of preterm birth, compared to the preconception period, among non-Hispanic Black women. We observed a significant effect among non-Hispanic White women only for the third trimester, however in the opposite direction ($\beta=-0.006$ 95% CI(-0.012, -0.001)).

Conclusion

We found that the timing of EITC benefits during pregnancy influences risk of preterm birth. Receipt of income in the months prior to conception appears to have a protect effect for preterm birth. This finding was further supported among non-Hispanic Black births, the population at greatest risk of preterm delivery. These findings have important implications for understanding stress physiology of pregnancy. They also indicate the importance of social policy not only to promote poverty alleviation but to alter risk environment for pregnancy and childbirth. Limitations of the study include misclassification of EITC receipt given available data.

EITC may serve as a policy level which could decrease stress during pregnancy, potentially improving in perinatal outcomes.