Randomized Evaluation of the Nurse Family Partnership in South Carolina

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Sector(s): Health

J-PAL office: J-PAL North America

Location: South Carolina, United States of America

Sample: 5,670 Medicaid-eligible pregnant people

Target group: Children under five Mothers and pregnant women

Outcome of interest: Mortality Sexual and reproductive health Health outcomes Maternal health Long-term results

Intervention type: Early childhood development Health care delivery

AEA RCT registration number: AEARCTR-0001039

Research Papers: Effect of an Intensive Nurse Home Visiting Program on Adverse Birth Outcomes in..., Home Visits With A Registered Nurse Did Not Affect Prenatal Care In A Low-Incom...

Partner organization(s): Nurse-Family Partnership, South Carolina Department of Health and Human Services, South Carolina Revenue and Fiscal Affairs Office, Harvard Kennedy School Government Performance Lab, University of South Carolina Rural and Minority Health Research Center, Arnold Ventures, Blue Meridian Partners, The BlueCross BlueShield Foundation of South Carolina, The Boeing Company, Children's Trust of South Carolina, The Duke Endowment, Greenville County First Steps, Social Finance

Policymakers are increasingly seeking rigorous evidence on the impact of programs that go beyond typical health care settings to improve outcomes for low-income families and children during the years spanning transition to parenthood through early childhood. Researchers are conducting a randomized evaluation of an intensive nurse home visiting program delivered at scale to

low-income mothers to test its impact on pregnancy and birth outcomes, child health and development, and future life-courses for the family. The program had no effect on adverse birth outcomes or prenatal outcomes such as health care utilization; the other categories of outcomes are still being evaluated.

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Childhood poverty in the United States is linked to adverse children's health and development outcomes and early life experiences can shape children's long-term experiences well into adulthood. There is growing policy interest in addressing the challenges faced by low-income families during early childhood, with a recognition that effective policies and interventions will address maternal and child wellbeing in tandem. Interrelated social and structural factors, such as unequal access to health resources, food and housing security, racism, environmental exposures, contribute to both the persistent impacts of poverty and disparities in who experiences childhood poverty in the United States. Some promising approaches to addressing these disparities go beyond the typical clinical health care setting, but more evidence of their impacts is needed.

Intensive home visiting programs are one strategy intended to improve maternal and newborn outcomes. There are multiple established home visiting programs in the United States, and these programs receive substantial federal funding through the Maternal, Infant and Early Childhood Home Visiting (MIECHV) Program. However, previous randomized evaluations tell a mixed and nuanced story about the impact of home visiting. Some evaluations and observational studies have indicated improvements in mental wellbeing and stress, future employment and education outcomes for participating families, and on some birth outcomes for some groups of mothers. However, other evaluations have found more limited evidence of impact in these outcomes and observed impacts have varied for subgroups of individuals in the studies. Against this mixed picture, rigorous evidence on the impacts of intensive home visiting at scale for low-income families is needed.

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The Nurse-Family Partnership® (NFP) is a non-profit organization that served more than 50,000 families each year in the United States in 2020. NFP's nurse home visiting program pairs nurses with low-income individuals during early pregnancy and continues until the child is two years old. Between 1977 and 1994, NFP conducted randomized evaluations of its program in New York, Tennessee, and Colorado, finding that NFP improved some measures of child and maternal health and increased intervals between subsequent births.

Motivated by the state's high preterm birth rate and by the prior evidence on NFP, the South Carolina Department of Health and Human Services (SC DHHS) provided a federally-approved billing pathway to provide Medicaid funding to expand NFP home visiting services across the state between 2016 and 2020. Mirroring NFP's eligibility criteria, individuals were eligible if they were less than 28 weeks pregnant at the time of enrollment, had never given birth before, were income-eligible for Medicaid, and lived in an NFP-served county (32 of 46 South Carolina counties, covering urban and rural areas). At enrollment, 18 percent of participants were younger than 19 years old, and 55 percent were 19–24 years old. 55 percent of participants were Black, 34 percent were White, and 6 percent were Hispanic. Two-thirds received a social service program, such as unemployment benefits or nutrition assistance benefits. Notably, this intervention included an expansion of the scale at which NFP operated in South Carolina, from 500-600 participants annually prior to the study to an average of about 1,200 each year during the study enrollment period.



A mother holding her baby.

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Researchers are conducting a randomized evaluation to measure the impact of NFP on pregnancy and birth outcomes, child health and development, and family planning and birth spacing. Between April 2016 and March 2020, 5,670 Medicaid-eligible pregnant individuals were enrolled into the study across urban and rural areas in South Carolina. Approximately two-thirds of study participants were randomly assigned to receive NFP services, while the rest received the usual care available to Medicaid-eligible pregnant individuals in their communities. Participants were either self-referred or were referred through multiple channels including clinicians, schools, or Medicaid to one of nine NFP implementing sites embedded in government agencies and hospital systems throughout South Carolina. Nurses conducted on-the-spot randomization assisted by randomization software in encrypted tablets.

The intervention entailed the established NFP program. Nurses conducted home visits that lasted 60–90 minutes per session, occurring every week during the first four weeks after enrollment and then every other week until delivery. Nurses tailored activities to clients' strengths, risks, and preferences using motivational interviews, educational tools, health assessments, and goal-setting related to prenatal health, child health and development, and future planning. They encouraged health care utilization when needed and made referrals to health and social services. Treatment group participants were eligible to receive up to fifteen home visits during pregnancy.

Outcomes and Data Sources: The evaluation focuses on three primary outcomes hypothesized to be affected by home visiting: the likelihood of a participant having an adverse birth outcome, the likelihood of a child experiencing injury, abuse, or neglect during

early childhood, and birth spacing. Secondary outcomes include additional measures related to pregnancy and birth outcomes and child health and development, as well as outcomes related to maternal life course and future outcomes for the parent during early childhood. To assess these outcomes, researchers are using administrative data from a variety of sources, including Medicaid and hospital data, vital records, NFP program records, and a host of state agencies ranging from health care to social services to criminal justice and employment. This is facilitated by the data-rich environment in South Carolina, where there is an agency dedicated to linking administrative records across many domains.

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While analysis of the program's impact on birth outcomes has concluded, the analysis of outcomes related to child health and development and birth spacing are ongoing.

Adverse birth outcomes

There was no statistically significant effect of receiving NFP services on the primary composite outcome of adverse birth events, which included preterm birth, low birthweight, small-for-gestational-age birthweight, or perinatal mortality. 26.9 percent of participants who were randomized to receive NFP experienced an adverse birth outcome, compared to 26.1 percent of individuals who received usual care—a difference that was not statistically significant. There was also no detectable effect on any individual component of the composite, nor on nine other secondary outcomes (including the individual elements of the composite outcome, birthweight, gestational length, large-for-gestational-age, extremely preterm, very low birthweight, overnight NICU admission, severe maternal morbidity, and cesarean delivery). These results are consistent with other recent evaluations that have suggested home visiting does not reduce adverse birth outcomes.

The study did not find evidence of different effects for pre-specified subgroups of participants. Black individuals who received usual care experienced adverse birth events at a higher rate (31.6 percent) than the average for the usual care group overall (26.1 percent), but NFP services caused no statistically significant impacts on any adverse birth outcomes for Black individuals. There was also no difference between the intervention and usual care groups in any outcome for individuals identified as being particularly vulnerable to challenges during pregnancy and early childhood based on characteristics identified in prior home visiting trials (those who were younger than 19 years old, had not finished high school, or had challenges with mental health), who are prioritized by many current home visiting programs.

Prenatal care and pregnancy outcomes

There were no statistically significant effects of receiving NFP on potential drivers of birth outcomes, including prenatal care quantity and intensity (adequate prenatal care, number of prenatal visits and ultrasounds); receipt of guideline-based prenatal care (anatomy scan ultrasound, gestational diabetes test, Tdap vaccination, Group B streptococcus test); and other health care use and health outcomes (dental visit during pregnancy, maternal fetal medicine visit, number of emergency department visits, recommended gestational weight gain).

There were no statistically significant effects of receiving NFP on these outcomes among non-Hispanic Black participants or those who were socially vulnerable due to being younger, having lower educational attainment, or facing mental health challenges.

Comparison to non-study participants

To better understand if those who enrolled in the study had different health and social needs compared to the overall state Medicaid birthing population, the research team compared the study population to those who would have been eligible but did not enroll. The research team found that study participants were younger, more likely to be Black, and less likely to have completed post-secondary education. Study participants also had higher rates of pre-pregnancy obesity and hypertension and higher rates of NICU admission, but no difference in other birth outcomes. Enrollees had higher use of prenatal care and the

Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) compared to the eligible non-enrolled. Taken together, while study participants were found to have higher health and social needs, they were also more likely to be engaged in prenatal care and social services.

Lessons and conclusions

In this South Carolina-based evaluation of Medicaid-eligible pregnant individuals, assignment to participate in intensive nurse home visiting did not significantly reduce the incidence of a composite of adverse birth outcomes or impact the potential drivers of birth outcomes studied, such as prenatal care utilization and quality. Intensive nurse home visiting programs are driven by patients' needs, interests, and concerns and aim to change patients' knowledge, behaviors, and access to other health resources via referral. Interventions aimed at affecting these elements during and soon after pregnancy may not be enough to address the complex factors that influence adverse birth events, including pre-pregnancy health and interrelated structural and environmental factors. Furthermore, interventions staffed by clinicians that require intensive visits to participants' homes may struggle to engage those who are not already engaged with these services. More evidence is needed to understand which interventions are effective at reducing adverse birth outcomes, addressing racial inequities in these outcomes, and reaching those who are less engaged with health and social services.

Evaluation of the overall impact of this intervention is ongoing. Future analyses will consider the effect of the program on birth spacing and child injuries, as well as early childhood health and development outcomes, use of social services, and long-term impacts on a range of outcomes including maternal and child health, child school-readiness and performance, maternal educational attainment, and criminal justice involvement.



Margaret A. McConnell, Slawa Rokicki, Samuel Ayers, Farah Allouch, Nicolas Perreault, Rebecca A. Gourevitch, Michelle W. Martin, R. Annetta Zhou, Chloe Zera, Michele Hacker, Alyna Chien, Mary Ann Bates, and Katherine Baicker. 2022. "Effect of an Intensive Nurse Home Visiting Program on Adverse Birth Outcomes in a Medicaid-Eligible Population: A Randomized Clinical Trial." JAMA 328(1):27–37. doi:10.1001/jama.2022.9703.