



RESEARCH BRIEF #5: NURSE HOME VISITING

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WHAT IS NURSE HOME VISITING?

Under the Nurse-Family Partnership program, the most well-developed nurse home visiting program in the United States, nurses conduct a series of home visits to low-income, first-time mothers, starting during pregnancy and continuing through the child's second birthday. Registered nurses work closely with first-time mothers following a curriculum that focuses on 1) healthy behaviors to improve pregnancy outcomes; 2) parenting skills to improve child health and development; and 3) plans for the mother's life (delaying second pregnancies, finishing school, getting a job). Initially visits are weekly, but then they taper to once a month through the child's second birthday. Adherence to the Nurse-Family Partnership intervention model is closely monitored through a web-based management information system. By restricting eligibility to low-income, first-time mothers, the program serves those whose children are at highest risk; many in the client population are single and/or teen parents. The program is currently serving approximately 13,000 families in 23 states with operating costs of approximately \$4,500 per family per year.¹

This research brief is one in a series of research briefs on the impacts of early childhood programs. See the websites for First Focus (www.firstfocus.net) and the Brookings Center on Children and Families (www.brookings.edu/ccf) for the full series including an overview and briefs on State Pre-K, Head Start, Early Head Start, Model Early Childhood Programs, and Nurse Home Visiting.

WHAT IS THE IMPACT OF NURSE HOME VISITING ON CHILDREN AND THEIR MOTHERS?

Random-assignment evaluations in three sites (Elmira, New York; Memphis, Tennessee; and Denver, Colorado) have documented positive effects on both mothers and children.

Cognitive and School-Related Outcomes: The positive impacts of nurse home visitation on children's IQ scores and school achievement have been limited largely to children born to mothers who were low in psychological resources, that is, mothers who scored low on measures of intelligence, mental health, and self-confidence:

- *Higher achievement scores.* In Memphis, home-visited children born to mothers with low psychological resources had higher achievement scores on state math and reading tests in grades one to three than a control group who were not visited, as well as higher grade point averages (increase from 2.44 to 2.68 in math and reading GPA).²

- *Higher language skills.* In Denver, children of mothers low in psychological resources had higher scores on language and intellectual functioning after nurse home visiting.³

Behavioral and Socio-emotional Outcomes: There is some scattered evidence that nurse home visits have positive impacts on children's behavior in early years.⁴ In addition, the fifteen-year follow-up in Elmira, New York, found a significant reduction in criminal behavior among children of nurse-visited mothers (see below under long-term outcomes).

Health and Safety Outcomes: Nurse home visitation has been successful in improving the health of pregnant mothers, with enough improvement in one site to lead to noticeable improvements in birth outcomes. In addition, the program has led to a noticeable reduction in health care encounters for injuries after the child is born, an indication of improved child safety practices and quite possibly a reduction in child abuse and neglect. Specific outcomes include:

- *Reduced smoking and fewer preterm deliveries.* Mothers visited by nurses smoked fewer cigarettes and showed dietary improvements over the course of the pregnancy. Rates of preterm births were lower among younger adolescent mothers and mothers who smoked upon program entry in Elmira.⁵
- *Fewer emergency room visits.* When compared with children not visited by nurses, nurse-visited children in Elmira had fewer emergency room visits and children in Memphis had fewer physician or hospital visits to treat injuries and ingestions.⁶
- *Reduced rates of child abuse and neglect.* The fifteen-year study in Elmira found a 48 percent reduction in rates of child abuse and neglect among low-income families.⁷ Rates of substantiated child abuse and neglect were too low in the other sites to adequately assess the impact, but as noted above, the programs did show reductions in emergency room visits and child mortality.
- *Some evidence of lower child mortality rates.* The Memphis site found suggestive evidence of lower child mortality – one death among those who were visited by nurses compared to ten deaths among children in the control group. The one death in the nurse-visited group was due to a chromosomal anomaly, while nine out of the ten deaths in the other group involved preterm delivery, sudden infant death syndrome, or injuries that were potentially preventable.⁸
- *Lower rates of criminal behavior.* Nurse-visited mothers had 61 percent fewer arrests and 72 percent fewer convictions than mothers not visited by nurses over the 15-year follow-up period in Elmira.¹⁰

Other positive outcomes for nurse-visited families include reductions in welfare and food stamp use, increased maternal employment, more father involvement, and less domestic violence. These impacts were not observed consistently across all three sites, however.¹¹

Long-term Outcomes: Currently, published findings track children through age four in Denver, through age nine in Memphis, and through age fifteen in Elmira, providing good evidence that impacts have lasted over time:

- Positive impacts on children’s school achievement have been observed through age nine in Memphis (see above under cognitive outcomes);
- At age fifteen, nurse-visited children in Elmira had 59 percent fewer arrests than children not visited by nurses, as well as fewer convictions. They also were less likely to be adjudicated as a “Person in Need of Supervision” because of incorrigible behavior.¹²
- Many of the positive outcomes for mothers, including reduced subsequent births and longer delays between births, persist over the long term.

Benefit-Cost Estimates: Two benefit-cost analyses suggest benefits exceed costs. Analysts at RAND calculated a benefit-cost ratio of \$5.68 for the high-risk sample in Elmira (and \$1.26, lower but still cost-effective, for the low-risk sample). An analysis of costs across the full samples at all three sites conducted for the Washington State legislature resulted in a benefit-cost ratio of \$2.88.¹³

HOW DO NURSE HOME VISITING IMPACTS VARY?

At-Risk Mothers. All mothers enrolled in the program are first-time mothers. Results from the first

Outcomes for Parents: As noted above, mothers’ health improved during pregnancy. In addition, program participants had the following outcomes:

- *Fewer subsequent births and longer duration between births.* The number of months between first and second births increased by 4.1 months in Denver, 6.6 months in Memphis, and 27.5 months for the unmarried, low-income sample in Elmira (by 4.4 months for the full Elmira sample). The total number of subsequent births also declined.⁹

site (Elmira) indicate that impacts were larger for first-time mothers who faced additional risk factors (specifically, being low-income, unmarried, or teen mothers). Following this finding, the nurse home visiting program has limited enrollment to low-income first-time mothers, a population that also is predominantly unmarried and adolescent.

Race and Ethnicity. It is not possible to compare impacts across different racial and ethnic groups. However, it is important to note that positive impacts have been found in locations serving diverse racial and ethnic groups: semi-rural upstate New York (largely White); Memphis, Tennessee (predominantly Black); and Denver, Colorado (a population including a large number of Hispanics).

Professional Credentials of Home Visitors. Program impacts were smaller and often statistically insignificant when the intervention was provided by paraprofessionals in place of nurses, according to a careful randomized study of the two types of home visitors.¹⁴

HOW STRONG IS THE EVIDENCE BASE FOR NURSE HOME VISITING?

The research evidence on nurse home visiting is quite strong, drawing on rigorous, random-assignment evaluations of nurse home visiting programs in three different sites, operating in a variety of settings and serving populations of diverse racial and ethnic backgrounds.¹⁵ All three evaluations had fairly large samples (400 in Elmira, 735 in Denver, and 743 in Memphis), gathered data over a broad range of outcomes (interview data was supplemented by various health, crime, and education administrative records), and followed participants for many years (through age fifteen in Elmira, and at this point, through age nine in Memphis, and age four in Denver), with relatively little attrition.

Critics point out that results are not found consistently across all three sites, and that the programs in Memphis and Denver, while showing significant effects on some outcomes, did not have as strong results as those shown for the low-income sample in Elmira, New York. Another potential

concern is that the principal investigator, David Olds, is also the architect of the program, and, thus, the program has not been evaluated by an independent investigator. This concern is lessened by the fact that the research staff were blind to whether participants were in the nurse-visited or control groups, results have been published in peer-reviewed journals, and the overall quality of the trials is generally viewed as high. A final critique is that nurse home visiting, like other home visiting programs, does not have as much effect on children's cognitive outcomes as center-based preschool programs, where the intervention is directly targeted to the child, rather than focused on changing the behavior of the parent.

IS NURSE HOME VISITING GENERALLY VIEWED AS EFFECTIVE?

Overall, the evidence of effectiveness for nurse home visiting, and specifically, the Nurse-Family Partnership program, is very strong, given the range of positive outcomes across three different randomized trials – and given the extensive follow-up data showing that effects, while modest, endure over time and outweigh program costs. The program has been named as an “effective” or “cost-effective” program in reviews by researchers at a variety of organizations, including the Coalition for Evidence-Based Policy, the Committee for Economic Development, the Brookings Institution, the RAND Corporation, the Washington State Institute for Public Policy, and Blueprints for Violence Protection. Note that most of these reviews focus on *nurse* home visiting, not home visiting overall, in their citation for effectiveness.

WHAT FEDERAL LEGISLATIVE ACTION LIES AHEAD FOR NURSE HOME VISITING?

Both the President and Congress demonstrated support for nurse home visiting by appropriating \$10 million for home visitation models in fiscal year 2008, a year when many other discretionary programs were being cut. Until these funds were appropriated, there was no direct federal funding source for nurse home visiting programs, although many state and local programs drew on federal funding under Medicaid and Temporary Assistance for Needy Families, as well as state, local, and private funding. Bills have been

introduced to expand funding for nurse home visiting specifically, and for home visiting more generally:

- S. 1052/H.R. 3024, the Healthy Children and Families Act, introduced by Senator Salazar (D-CO) and Representative DeGette (D-CO) would allow states the option of providing nurse home visitation services under Medicaid and the State Children's Health Insurance Program.
- S. 667/H.R. 2343, the Education Begins at Home Act, introduced by Senator Bond (R-MO) and Representative Davis (D-IL), would authorize grants to states to fund home visitation services during early childhood. H.R. 2343 was reported out of the House Committee on Education and Labor on June 18, 2008.

In addition, presidential candidate Barack Obama has declared his support for providing nurse home visiting to all low-income first-time mothers.¹⁶

NOTES:

- ¹ Nurse Family Partnership National Service Office, *Nurse-Family Partnership: Effective and Affordable - What's Not to Like About It?* (Denver: Nurse Family Partnership, 2008), http://www.nursefamilypartnership.org/resources/files/PDF/Fact_Sheets/NFPCostBrief.pdf.
- ² The cognitive outcomes of children in Memphis have been studied at ages two, six, and nine. There were no statistically significant differences in cognitive skills at age two; small positive gains at age six on IQ, particularly among the low-resource sample; and gains in achievement tests at age nine (only significant for the low-resource sample). See Kitzman et al. 1997; Olds et al., 2004a; Olds et al., 2007 (full citations in reference table below).
- ³ The children in Denver have been observed at ages two and four (published results thus far). There was some evidence of small positive gains at age two (in overall sample, and to a greater extent in low-resource sample) and at age four (among the low-resource sample). The effect sizes of nurse home visiting were 0.31 on language skills and 0.47 on executive functioning among the low-resource children at age four. See Olds et al., 2002 and 2004b.
- ⁴ There were no significant effects on mothers' reports of children's behavior at age four in Denver (although testers reported that nurse-visited children born to low-resource mothers regulated their behavior better during testing), nor at ages two or nine in Memphis. However, at age six, nurse-home visited mothers in Memphis reported fewer children exhibiting severe behavioral problems (1.8 percent vs. 5.4 percent) and children born to low-resource mothers revealed less dysregulated aggression and incoherence in response to story stems. See Olds et al., 2004a.
- ⁵ The improvement in pregnancy outcomes was strongest in Elmira, where nurse-visited women improved their diets and reduced cigarette smoking, and there were significant reductions in preterm births among smokers and adolescents (but not older non-smokers). In addition, nurse-visited women in Memphis had fewer prenatal hypertensive disorders, and nurse-visited women in Denver had lower levels of cotinine (a biological marker for cigarette smoking). See Olds et al, 1986, Kitzman et al, 1997, and Olds et al., 2002.
- ⁶ Differences in days of hospitalization and health care encounters for injuries and ingestions are based on observations during the first four years in Elmira and two years in Memphis. Such data were not tracked in Denver because researchers were unable to access similar health system records. See Olds et al., 1986b; Olds et al., 1994; Kitzman et al., 1997.
- ⁷ Ibid.
- ⁸ The difference in mortality in Memphis at age nine was statistically significant at the 0.10 confidence level but not the 0.05 level. See Olds et al., 2007.
- ⁹ The reduction in subsequent births was significant in Memphis and Elmira but was not statistically significant in Denver, at least not as of data collected when the first child was four years old. See Olds et al., 2007; Olds et al., 1997; and Olds et al., 2004b.
- ¹⁰ See Olds et al, 1997 (Elmira, age 15).
- ¹¹ Reductions in welfare use were observed in Elmira (child age fifteen) and Memphis (child age six and age nine), but not Denver (child age four). Increases in father involvement and partner stability were observed in Memphis (age six and nine), but not in Denver (age four). Reductions in domestic violence against mothers were observed in Denver. Differences in populations served, available measures, and historical context (e.g., before and after welfare reform) may explain some of the differences observed across sites. See Olds et al., 1998, Olds et al, 2004a, Olds et al, 2007, Olds et al, 2004b.
- ¹² These outcomes are for the full sample; similar outcomes occurred for the low-income sample. See Olds et al, 1998, and Coalition for Evidence-Based Policy, *Nurse-Family Partnership*, <http://www.evidencebasedprograms.org/Default.aspx?tabid=35>.
- ¹³ Benefit-cost evidence is summarized in Julia Isaacs, *Cost-Effective Investments in Children* (Washington, D.C.: Brookings Institution, 2007), http://www.brookings.edu/papers/2007/01childrenfamilies_isaacs.aspx.
- ¹⁴ Olds et al., 2002.
- ¹⁵ The first site, Elmira, served a largely White, semi-rural population in upstate New York and included first-time mothers of varying levels of socioeconomic advantage. Program effects were

concentrated in low-income populations, and services were restricted to such mothers in the second and third site. The second site, Memphis, served many African American mothers and was implemented in the “real-world” setting of the county health department. The third site, Denver, served a sizable Hispanic population and experimented with using paraprofessionals in place of professional nurses (outcomes above are reported for nurses, who had stronger impacts than paraprofessionals).

¹⁶ Julia Isaacs, *Candidates Issue Index: Children* (Washington, D.C.: Brookings Institution, 2008), http://www.brookings.edu/papers/2008/0515_children_isaacs_opp08.aspx.

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Kitzman et al. 2000	Memphis age four	Harriet Kitman, David Olds, Kimberly Sidora and others, “Enduring Effects of Nurse Home Visitation on Maternal Life Course: A 3-Year Follow-up of a Randomized Trial,” <i>JAMA</i> 283 (2000): 1983-1989.
Olds et al. 1986a	Elmira prenatal	David Olds, Charles Henderson, Robert Tattelbaum, and Robert Chamblin, “Improving the Delivery of Prenatal Care and Outcomes of Pregnancy: A Randomized Trial of Nurse Home Visitation,” <i>Pediatrics</i> 77 (1986): 16-28.
Olds et al. 1986b	Elmira age two	David Olds, Charles Henderson, Robert Tattelbaum, and Robert Chamberlin, “Preventing Child Abuse and Neglect: A Randomized Trial of Nurse Home Visitation,” <i>Pediatrics</i> 78 (1986): 65-78.
Olds et al. 1994	Elmira age four	David Olds, Charles Henderson, and Harriet Kitman, “Does Prenatal and Infancy Nurse Home Visitation Have Enduring Effects on Qualities of Parental Caregiving and Child Health at 25-50 Months of Life?” <i>Pediatrics</i> 93 (1994): 89-97.
Olds et al. 1997	Elmira age fifteen (mother)	David Olds, John Eckenrode, Charles Henderson and others, “Long-Term Effects of Home Visitation on Maternal Life Course and Child Abuse,” <i>JAMA</i> 278 (1997): 637-643.
Olds et al. 1998	Elmira age fifteen (child)	David Olds, Charles Henderson, Robert Cole, and others, “Long-Term Effects of Nurse Home Visitation on Children’s Criminal and Antisocial Behavior: 15-Year Follow-up of a Randomized Controlled Trial,” <i>JAMA</i> 280 (1998): 1238-44.
Olds et al. 2002	Denver age two	David Olds, JoAnn Robinson, Roth O’Brien and others, “Home Visiting by Paraprofessionals and Nurses: A Randomized, Controlled Trial,” <i>Pediatrics</i> 100 (2002): 486-496.
Olds et al. 2004a	Memphis age six	David Olds, Harriet Kitman, Robert Cole and others, “Effects of Nurse Home-Visiting on Maternal Life Course and Child Development: Age 6 Follow-Up Results of a Randomized Trial,” <i>Pediatrics</i> 114 (2004): 1550-1559.
Olds et al. 2004b	Denver age four	David Olds, JoAnn Robinson, Lisa Pettitt, and others, “Effects of Home Visits by Paraprofessionals and by Nurses: Age 4 Follow-Up Results of a Randomized Trial,” <i>Pediatrics</i> 114 (2004): 1560-1568.
Olds et al. 2007	Memphis age nine	David Olds, Harriet Kitman, Carole Hanks, and others, “Effects of Nurse Home Visiting on Maternal and Child Functioning: Age 9 Follow-up of A Randomized Trial,” <i>Pediatrics</i> 120 (2007): e832-e845.

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- Economic mobility and opportunity in the United States and investments in children, such as preschool programs, that could improve their chances to get ahead;
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