The Impact on Clients of a Community-Based Infant Mortality Reduction Program: The National Healthy Start Program Survey of Postpartum Women

Marie C. McCormick, MD, ScD, Lisa W. Deal, ScD, MS, MN, MPH, Barbara L. Devaney, PhD, Dexter Chu, MS, Lorenzo Moreno, PhD, and Karen T. Raykovich, PhD

Objectives. This study assessed the effect of the national Healthy Start Program on its clients.

Methods. We used a cross-sectional survey of a sample from Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) rosters of women less than 6 months postpartum who were residents of Healthy Start Program areas.

Results. Healthy Start clients revealed higher sociodemographic risk, but not behavioral risk, for adverse pregnancy outcome than other area residents. They did not differ from other residents in receipt of services except for a greater likelihood of receiving case management, using birth control at the time of the interview, and rating their prenatal care more highly.

Conclusions. The Healthy Start Program succeeded in enrolling women at high risk. It had little effect on the immediately concluded pregnancy, but it might influence future outcomes. (*Am J Public Health.* 2001;91:1975–1977)

Strategies to improve pregnancy outcome involve programs in disadvantaged communities to provide obstetric[1–3] and other types of services.[4–6] Reaching community residents at highest risk and providing services not otherwise available is critical. In evaluating the national Healthy Start Program (HSP),[7,8] we assessed (1) the success of HSP in enrolling community residents at risk for poor pregnancy outcome and (2) the experience of pregnant HSP clients compared with that of other pregnant community residents.

METHODS

The original national HSP, begun in 1991, was a 5-year demonstration of community-based approaches to reduce infant mortality in 15 geographically defined disadvantaged communities (see Acknowledgments). It has been described elsewhere.[9,10]

A survey[11] targeted women who were residents of HSP areas and less than 6 months postpartum by selecting a sample of mothers attending Special Supplemental Nutrition Program for Women, Infants and Children (WIC) clinics serving each HSP service area (see Table 1 for sample per site). Sample weights were calculated to adjust for the probability of selection, and a poststratification adjustment was used to make the final sample match external counts of HSP client and nonclient births in 1995 on the basis of birth records and the service data set. (A detailed memorandum on this procedure[12] is available from the authors.)

After verifying the respondent's address and HSP client status, we queried eligible respondents about their experiences in pregnancy and delivery (Table 2). Analyses were conducted with Stata.[20] Bivariate analyses relied on the Pearson χ^2 statistic and the likelihood ratio test. The hypothesis that status as client is exogenous[21] was tested[22] and was not rejected; thus, we did not attempt to control further for endogeneity in the regression models. Several logit models (standard, fixed effects, random effects) were estimated with the generalized estimating equation method and were indistinguishable.[23] Our estimates were derived from a standard logit (STAT svy commands[20]) and were weighted to reflect the design of the sample.

RESULTS

Between December 1995 and April 1996, of 8042 women screened, 45% were residents of Healthy Start areas; of these, over 90% responded to the interview, yielding an analysis sample of 1347 clients and 1329 nonclients (Table 1). On average, women were interviewed 2 months after delivery.

Clients of HSP exhibited greater sociodemographic risk for an adverse pregnancy outcome than did other women on WIC (Table 2), and they were less likely to receive prenatal care in a private office or health maintenance organization (HMO), instead relying more heavily on a hospital, health center, or other clinics. They were also more likely to see a midwife as part of their prenatal care. Both groups were equally high users of prenatal care services. HSP clients were more likely to receive expanded prenatal care services such as counseling on all health topics, case management, WIC during pregnancy, and all postpartum teaching topics. They were also more likely to be using a contraceptive at the time of the interview, to receive income assistance from food stamps and welfare, and to rate their infants as having less than excellent health. Otherwise, the groups were similar.

Two multivariate models were used to assess the net effect of participation as a client; models were estimated for variables differing between the 2 groups at a P value of .1 or less. The first model adjusted for differences in sociodemographic and obstetric risk (maternal age, education, race/ethnicity, income, marital status, and whether the pregnancy was intended); the second added the site of prenatal care. The association between being a program client and (1) the receipt of case management (adjusted odds ratio [OR]=3.25; 95% confidence interval [CI]=2.44, 4.34) and (2) not using birth control at the time of the interview (adjusted OR=0.71; 95% CI=0.52, 0.96) remained significant. Differences in receipt of Aid to Families With Dependent Children (AFDC) and food stamps, rating of infant health, and prenatal counseling topics were related to sociodemographic risk, because a

TABLE 1—Distribution of Respondents to the Postpartum Survey Among Healthy Start Program Clients and Other Area Residents, by Project Area, 1996

Project Area	Healthy Start Program Participation Status	
	Participants	Nonparticipants
Baltimore	57	5
Birmingham	231	75
Boston	45	89
Chicago	35	178
Cleveland	92	83
Detroit	122	105
District of Columbia	33	70
New Orleans	111	98
New York City	147	90
Northwest Indiana	80	89
Oakland	52	140
Pee Dee, SC	53	95
Philadelphia	131	110
Pittsburgh	158	102
Total	1347	1329

TABLE 2—Comparison of Healthy Start Clients and Nonclients by Sociodemographic, Service, and Behavior Variables

% Distribution by—	Healthy Start Program Status		
	Clients (n = 1347)	Nonclients (n = 1329)	*P*
Maternal age <20 y	25.0	15.2	<.001
Maternal education less than high school	45.6	36.2	<.005
African American	83.8	66.6	<.001
Household income			
Missing	17.0	16.8	<.05
<$5000/y	44.6	36.0	. . .
Never married	67.8	53.9	<.001
Parity = 1	44.2	40.4	NS
Pregnancy intended[13,14]	22.3	28.8	<.05
PNC in private office/HMO	18.8	35.9	<.001
Physician sole PNC provider	58.6	66.4	<.05
Insurance coverage for entire pregnancy	85.6	90.0	NS
Type of insurance			
Medicaid	73.7	67.4	NS
None	4.3	3.0	. . .
Smoking in pregnancy[a,13]	31.4	32.0	NS
Alcohol use in pregnancy[a,13]	16.4	11.7	NS
Drug use in pregnancy[a,13]	29.8	25.8	NS
Barriers to PNC	15.2	13.3	NS
Start of PNC later than 1st trimester	20.4	17.6	NS
PNC less than adequate[15]	22.8	18.7	NS
Fewer than all medical procedures performed[15]	14.4	19.1	NS[b]
Counseled on fewer than all health topics plus HIV[13]	44.8	50.9	<.05
Case management[16]	58.4	28.0	<.0001
No WIC services in pregnancy	16.2	22.7	<.05
Fewer than all postpartum teaching topics	54.7	62.0	<.05
Duration of postpartum stay <24 h	11.2	10.2	NS
Perceived quality of PNC less than excellent[17–19]	54.2	58.7	NS[c]
No continuity of obstetric provider	53.5	53.0	NS
No breastfeeding	59.7	54.3	NS
Not receiving food stamps	33.5	40.6	<.05
Not receiving AFDC	42.0	48.8	<.05
Not currently using birth control	47.9	56.7	<.05
Postpartum checkup not completed	37.2	36.1	NS
Well-baby care not started	18.6	20.7	NS
Immunizations not started	15.5	17.1	NS
Less than very satisfied with PNC	15.1	18.9	NS[d]
Rating of infant's health as less than excellent	40.5	46.2	<.05

Note. PNC = prenatal care; HMO = health maintenance organization; WIC = Special Supplemental Nutrition Program for Women, Infants, and Children; AFDC = Aid to Families With Dependent Children; NS = not significant.
[a]Among those who had smoked, drunk, or used illicit substances.
[b]*P* < .06.
[c]*P* = .10.
[d]*P* = .10

woman's status as client ceased to be significantly associated with these variables in the first model. The reliance of program clients on hospital or neighborhood clinics accounted for their greater use of WIC services prenatally. However, program clients remained less likely to be less than very satisfied with their prenatal care (adjusted OR=0.72; 95% CI=0.52, 0.99) and to rate it as less than excellent (adjusted OR=0.72; 95% CI=0.57, 0.91).

DISCUSSION

These results suggest that HSP has been successful in enrolling women who have factors associated with risks of adverse pregnancy outcomes; this has been achieved by focusing on prenatal care providers who serve higher-risk clients (i.e., hospital and neighborhood health clinics) and by enrolling younger, poorer women. The major advantage of being an HSP client is the receipt of case management. In addition, clients are more likely to rate their prenatal care more highly in qualitative terms and to be using birth control at the time of the interview. Although few differences in other services and behaviors were seen, the types of services that distinguished HSP clients from other residents (the use of birth control and perceptions of quality of care) may serve to improve subsequent use of services[24] and birth outcomes.[25] Future programs might devise strategies to work with women in smaller, private settings, where their supportive services may not duplicate those found in larger clinical settings.[26,27]

Limitations of this study include the short interval after delivery, which precludes examining many infant outcomes, including effects

of HSP on mortality and completion of immunization. Recruiting the target numbers of clients and nonclients in program areas with low proportions of either proved difficult within the resources of the evaluation, resulting in uneven sample sizes per area. Further, a sample of WIC participants provides information from those well integrated into services, indicated by higher proportions of our respondents with early prenatal care and more prenatal counseling than in national samples.[28,29] Thus, the experience of women who have more difficulty obtaining care may differ. Despite the limitations, the results suggest that community-based interventions like Healthy Start may require substantially longer in an individual's life to affect the use of health services and pregnancy outcomes. ■

About the Authors

Marie C. McCormick and Lisa W. Deal are with the Department of Maternal and Child Health, Harvard School of Public Health, Boston, Mass. Lisa W. Deal is also with the David and Lucile Packard Foundation, Los Altos, Calif. Barbara L. Devaney, Dexter Chu, and Lorenzo Moreno are with Mathematica Policy Research Inc, Princeton, NJ, and Washington, DC. Karen T. Raykovich is with the Office of Program Evaluation and Legislation, Health Resources and Services Administration, Rockville, Md.

Requests for reprints should be sent to Marie C. McCormick, MD, ScD, Department of Maternal and Child Health, Harvard School of Public Health, 677 Huntington Ave, Boston, MA 02115-6096 (e-mail: mmccormi@hsph.harvard.edu).

This article was accepted February 23, 2001.

Contributors

M.C. McCormick, a coprincipal investigator of the national evaluation, participated in the design of the survey instrument and prepared the written reports from the survey. L.W. Deal and D. Chu were the primary data analysts. B.L. Devaney, also a coprincipal investigator, provided input on design and analysis and had primary administrative oversight of the survey. L. Moreno was the senior statistician with responsibility for the modeling. K.T. Raykovich was the project officer who took an active role in designing the survey, serving as liaison with the Department of Agriculture, and revising and editing the manuscript.

Acknowledgments

This study was supported by a contract from the Health Resources and Services Administration of the US Dept of Health and Human Services (HRSA Contract 240-93-0050).

The study was approved by the Committee on the Use of Human Subjects in Research of the Harvard School of Public Health.

The authors wish to acknowledge the cooperation of the Food and Consumer Service of the US Dept of Agriculture and the state and local staff of the WIC for facilitating access to their clients. In addition, they wish to acknowledge the following Healthy Start projects: Baltimore Healthy Start Program, Birmingham Healthy Start Initiative, Boston Healthy Start Initiative, Chicago Healthy Start Program, Cleveland Healthy Family/Healthy Start Project, Detroit Healthy Start Initiative, District of Columbia Healthy Start, New Orleans Healthy Start/Great Expectations, Healthy Start/New York City, Northwest Indiana Healthy Start, Oakland Healthy Start, United Way of South Carolina/Healthy Start—A Rural Community Partnership (Pee Dee, NC), The Allegheny County/City of Pittsburgh Healthy Start Program, Philadelphia Healthy Start, and Northern Plains Healthy Start.

This report represents one in a series of evaluation reports on the Healthy Start Program and should be interpreted in that light. The final report on the national evaluation, which was completed in the summer of 2000, synthesized all previous findings and presented findings on key outcome variables, including infant mortality rates. An assessment of the ultimate effectiveness of the Healthy Start Program was included in the final report on the program.[30]

REFERENCES

1. Korenbrot C, Clayson Z, Gill A, Patterson E. *Evaluation of the Implementation of the Comprehensive Perinatal Service Program.* San Francisco: Institute for Health Policy Studies, University of California; 1993.
2. Miller C, Margolis L, Schwethalm B, Smith S. Barriers to implementation of a prenatal care program for low-income women. *Am J Public Health.* 1989;79:62–64.
3. Strobino D, Chase G, Kim Y, Crawley B, Salim J, Baruffi G. The impact of the Mississippi Improved Child Health Project on prenatal care and low birthweight. *Am J Public Health.* 1986;76:274–278.
4. Olds DL, Kitzman H. Review of research on home visiting for pregnant women and parents of young children. *Future Child.* 1993;3(3):53–92.
5. Peoples M, Grimson R, Daughtry G. Evaluation of the effects of the North Carolina Improved Pregnancy Outcome Project: implications for state-level decision-making. *Am J Public Health.* 1984;74:549–554.
6. Herman AA, Berendes HOV, Yu KF, et al. Evaluation of the effectiveness of a community-based enriched model prenatal intervention project in the District of Columbia. *Health Serv Res.* 1996;31:609–621.
7. Devaney B, McCormick M. *Evaluation Design: National Evaluation of Healthy Start.* Princeton, NJ: Mathematica Policy Research, Inc; 1993.
8. Raykovich KST, McCormick MC, Howell EM, Devaney BL. Evaluating the Healthy Start Program. Design development to evaluative assessment. *Eval Health Prof.* 1996;19:342–362.
9. Howell EM, Devaney B, McCormick M, Raykovich KT. Back to the future: community involvement in the Healthy Start Program. *J Health Polit Policy Law.* 1988;23:292–317.
10. Howell EM, Devaney B, Foot B, et al. *The Implementation of Healthy Start. Lessons for the Future.* Washington, DC: Mathematica Policy Research Inc; 1997.
11. McCormick MC, Deal LW. *The National Healthy Start Program: Report From a Survey of Postpartum Women.* Washington, DC: Mathematica Policy Research Inc; 1998.
12. Chu D, Deal L, McCormick M, Cohen R, DeSaw C, Potter F. *The Healthy Start Postpartum Data Set: Final Report.* Princeton, NJ: Mathematica Policy Research Inc; 2000.
13. Sanderson M, Placek PJ, Keppel KG. The 1988 National Maternal and Infant Health Survey: design, content, and data availability. *Birth.* 1991;18:26–32.
14. Maynard R, Nicolson W, Rangarajan A. *Breaking the Cycle of Poverty: The Effectiveness of Mandatory Services for Welfare Dependent Teenage Parents.* Princeton, NJ: Mathematica Policy Research Inc; 1993.
15. Kotelchuck M. An evaluation of the Kessner Adequacy of Prenatal Care Index and a proposed Adequacy of Prenatal Care Utilization Index. *Am J Public Health.* 1994;84:1414–1420.
16. Devaney B, Chu D, Foot B, McCormick M, Howell EM. *Case Management in Healthy Start.* Princeton, NJ: Mathematica Policy Research Inc; 1998.
17. Githens PB, Glass CA, Sloan FA, Entman SS. Maternal recall and medical records: an examination of events during pregnancy, childbirth, and early infancy. *Birth.* 1993;20:136–141.
18. Entman SS, Glass CA, Hickson GB, Githens PB, Whetten-Goldstein K, Sloan FA. The relationship between malpractice claims history and subsequent obstetric care. *JAMA.* 1994;272:1588–1591.
19. Clement D, Retchin S, Stegall M, Brown R. *Evaluation of Access and Satisfaction With Care in the TEFRA Program.* Richmond: Medical College of Virginia; 1992.
20. *Stata Statistical Software, Release 6.0* [computer program]. College Station, Tex: Stata Corp; 1999.
21. Intriligator MD. *Econometric Models, Techniques and Applications.* Englewood Cliffs, NJ: Prentice-Hall Inc; 1978:28–29.
22. Bollen K, Guilkey D, Mroz T. Binary outcomes and endogenous explanatory variables: tests and solutions with an application to the demand for contraceptive use in Tunisia. *Demography.* 1995;32:111–129.
23. Zeger SL, Liang KY, Albert PS. Models for longitudinal data: a generalized estimating equation approach. *Biometrics.* 1988;44:1049–1060.
24. Higgins P, Murray ML, Williams EM. Self-esteem, social support and satisfaction differences in women with adequate and inadequate prenatal care. *Birth.* 1994;21:26–33.
25. Brown S, Eisenberg L, eds. *The Best Intentions.* Washington, DC: National Academy Press; 1995.
26. Frida MC, Andersen HF, Damus K, Merkatz IR. Are there differences in information given to private and public prenatal patients? *Am J Obstet Gynecol.* 1993;169:155–160.
27. Kotelchuck M, Kogan MD, Alexander GR, Jack BW. The influence of site of care in the content of prenatal care for low-income women. *Matern Child Health J.* 1997;1:25–34.
28. National Center for Health Statistics. *Health United States 1995.* Hyattsville, Md: Public Health Service; 1995.
29. Kogan MD, Alexander GR, Kotelchuck M, Nagey DA, Jack BW. Comparing mothers' reports on the content of prenatal care received with national recommended guidelines. *Public Health Rep.* 1994;109:637–646.
30. Devaney B, Howell E, McCormick M, Moreno L. *Reducing Infant Mortality: Lessons Learned From Healthy Start. Final Report.* Princeton, NJ: Mathematica Policy Research Inc; 2000.