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SUMMARY OF THE FINAL EVALUATION OF NORTH CAROLINA'S MATERNAL OUTREACH WORKER (MOW) PROGRAM

by

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ABSTRACT

In this report, findings from the *Final Evaluation Report*¹ of North Carolina's Maternal Outreach Worker (MOW) Program are presented. The focus here is on the evaluation of program objectives, as originally proposed in the 1991 grant application to the Kate B. Reynolds Foundation. The MOW Program is a community-based home visiting program designed to help low income and at-risk pregnant women make full and early use of the existing health care system, achieve a sustainable reduction in risk factors, and reduce adverse birth outcomes. It is also designed to improve infant development. The MOW group included participants from 24 counties, selected during the initial funding period. A comparison group included pregnant women in the Maternity Care Coordination (MCC) Program, in counties not participating in the MOW Program. The evaluation was conducted on two levels: (1) a program-wide analysis of birth certificate data and other service related data from state-level information systems, and (2) a three-panel interview study including a subset of women from nine project and nine comparison sites. The results suggest that the success of the MOW Program in meeting its stated objectives was mixed. The observed number of low birth weight births and very low birth weight births among African American participants was slightly lower than what was expected. With respect to use of maternal and child health services, we observed few differences between participants and the comparison group. MOW participants were found to be at much higher risk than non-participants on factors such as age and education, so the lack of positive findings for the program should not automatically be interpreted as a lack of program effectiveness.



BACKGROUND

In July 1991, the Division of Maternal and Child Health (MCH) received a \$2.8 million grant from the Kate B. Reynolds Health Care Trust. In conjunction with the Division of Medical Assistance and the Office of Rural Health and Resource Development, the MCH Division developed and began the Maternal Outreach Worker (MOW) Program.

The MOW Program was designed as the next logical step in extending the Medical Assistance (Baby Love) Program to combat the state's unacceptably high rate of infant mortality. The role of the Maternal Outreach Worker was to help the Maternity Care Coordinator provide home visiting support to isolated, at-risk pregnant women.

Initial funding for the project went to 24 local health agencies serving 26 counties across the state. Maternal outreach workers were hired in early 1992 and training began in the spring of that year. The training included skill development in relationship building, communication, problem solving, emotional and family support, use of available resources, making referrals, and client advocacy. Caseload sizes were kept small (25-30) to ensure adequate provision of services. Participants in the MOW Program consisted of Medicaid-eligible women, 28 or fewer weeks pregnant, who were identified by the Maternity Care Coordinator as being in need of extra help.

MOW PROGRAM OBJECTIVES

Developed as a community-based home visiting program, the MOW Program is designed to help low income and at-risk pregnant women: (1) make full and early use of the existing health care system, (2) achieve a sustainable reduction in risk factors, and (3) reduce adverse birth outcomes. In accordance with these aims, it was thought that the MOW Program would meet the following objectives for eligible pregnant women and infants up to age one²:

- ◆ promote earlier and more continuous use of prenatal care;
- ◆ improve use of pregnancy-related services;
- ◆ promote maternal compliance with behaviors that reduce risk;
- ◆ improve birth weight;
- ◆ promote early and more continuous use of well-baby care services and other related programs; and
- ◆ promote greater use of WIC services.

In this report we examine specific results associated with the above objectives, and results on infant development at age one³.

METHODS

Definitions

In the following, "participant" or "MOW" refers to a woman enrolled in the MOW Program. The comparison group (that is, the group that *did not* receive MOW services) is distinguished by the terms "non-participant," "comparison," or "non-MOW." These distinctions hold true for the program-wide and the interview study.

Program-wide study

The program-wide sample consisted of mothers with infants born between July 1992 and October 1995, who participated in the MOW Program through the end of pregnancy. Those eligible for the study were mothers enrolled in one of the original 24 project sites, those who participated in the program for at least 29 days, and those who initiated services before the 29th week of pregnancy. Only single live births were included in the analysis. After excluding births that did not meet the sample criteria, there were a total of 1,726 MOW births in the study.

Comparison mothers included women receiving Maternity Care Coordination (MCC) in 33 counties that did not participate in the MOW project. Eligibility for the study was the same as that defined for

the MOW group, including beginning services prior to the 29th week of pregnancy. For analysis, 12,988 comparison births were selected.

MOW and comparison births were linked to the following information systems: (1) Medicaid Paid Claims files; (2) Health Services Information Systems files (NC health departments); and (3) the Pregnancy Nutrition Surveillance System files (prenatal/postnatal WIC). Data from these files and birth certificate information were used to weigh the differences between MOWs and non-MOWs on prenatal care, birth weight, and use of EPSDT and WIC services.

Interview Study

A series of face-to-face interviews were conducted on three different occasions: (1) during pregnancy (soon after program enrollment); (2) soon after birth; and (3) one year after birth of the baby. Interview subjects were recruited by Maternity Care Coordinators in each of nine MOW and nine non-MOW counties. In non-MOW counties, the Maternity Care Coordinator was asked to identify who would likely be referred to an outreach worker if the program was available; from this group comparison mothers were selected. Participation in the interview study was voluntary.

The interview contained questions about the mother's health history, health behaviors (for example, diet, exercise, substance abuse), social support networks, psychological status, family violence, perceived needs during/after pregnancy, demographic factors, and baby's health and development. Some questions were repeated across all interviews or across the 2nd and 3rd interviews, allowing for the analysis of change over time. All interviews were administered by trained interviewers.

The interview sample consisted of 705 completed first interviews (373 MOW and 332 non-MOW subjects). By the second interview, 81 MOWs (22%) and

68 non-MOWs (20%) dropped out of the study. By the third interview, an additional 43 MOW and 66 non-MOW subjects dropped out. That brought the study completion rates to 67 percent for the MOW group and 60 percent for the comparison group.

Analysis

For dichotomous outcomes (e.g., WIC participation: yes/no), categorical data analysis techniques were explored, including the chi-square test and the Cochran-Mantel-Haenszel (CMH) test. Logistic regression was used in the analysis of low birth weight (LBW) and very low birth weight (VLBW).

RESULTS

Tables 1A and 1B provide an overview of the evaluation results. The following paragraphs present the results, organized by objective.

Eligible Pregnant Women

Table 1A suggests that, for the most part, there was little difference in results between the two study groups. Mothers with and without MOW services fared about the same with respect to using pregnancy-related services and complying with behaviors that reduce risk.

Objective #1

The adequacy (and use) of prenatal care was measured by the Kessner index.⁴ The results from the program-wide study revealed that black MOW participants were less likely to have adequate care (61 percent for MOWs and 64 percent for non-MOWs). Also, they were more likely to be classified as receiving "intermediate" or "inadequate" care. Among whites there was a slightly higher percentage of MOWs receiving adequate care than non-MOWs (77 versus 75 percent).

**Table 1A. Evaluation Findings Related to MOW Program Objectives
for Eligible Pregnant Women*.**

Outcomes by Program Objective	Favorable	Neutral	Unfavorable
1. Promote use of prenatal care services.			
A. Black MOWs had less adequate prenatal care than the comparison group.**			X
B. White MOWs tended to have more adequate prenatal care than non-MOWs.	X		
2. Promote continuous use of pregnancy-related and supportive services.			
A. Slightly higher percentage of MOWs than non-MOWs had plans to continue with education after childbirth.		X	
B. Onset of birth control about the same for both groups.		X	
3. Improve patient compliance with risk reduction behaviors.			
A. Among smokers, the rate of those who either cut down, quit, or still smoked during pregnancy was about the same for MOWs and non-MOWs.		X	
B. Reduction of alcohol use during pregnancy was about the same for MOWs and non-MOWs.		X	
C. Among those exposed to domestic violence during or after pregnancy, help-seeking behaviors did not differ between study groups.		X	

*MOW Program objectives appear in boldface type; the related results include findings from both the program-wide and interview study. The ranking of results from “favorable” to “unfavorable” provides a rough measure of how well MOW participants fared in comparison to non-participants. The category “neutral” was applied for all outcomes not involving statistical significance. “Favorable” or “unfavorable” reflect results that were either statistically significant or close to statistical significance.

**p value < 0.05.

**Table 1B. Evaluation Findings Related to MOW Program Objectives
for Infants Up to Age One.**

Outcomes by Program Objective	Favorable	Neutral	Unfavorable
4. Improve birth weight.			
A. The observed number of LBW and VLBW births among black MOWs was lower than expected.	X		
B. Little or no difference in the expected versus observed number of LBW and VLBW births among white MOWs.		X	
5. Enhance use of infant health services.			
A. No difference was found between MOWs and comparisons with respect to onset of EPSDT visits within 3 months postpartum.		X	
B. Among blacks, completion of 4 or more well-baby checkups during first year of life was higher among MOWs.	X		
C. Among whites, the rate for childhood immunization was lower for MOWs than non-MOWs.			X
6. Promote use of WIC services.			
A. No difference in the MOW and non-MOW rates of prenatal/postnatal WIC participation.		X	
7. Infant development at age one.			
A. MOW infants displayed higher levels of development than comparison infants.**	X		

**p value < 0.05

Objective #2

Results from the interview study revealed that the majority of mothers had plans to continue with their education. Among mothers who indicated during the first interview a desire to return to school, no significant differences in educational plans were evident between MOWs and non-MOWs by the 3rd interview.

Onset of birth control was examined as a substitute for use of family planning services. For those whose second interview date was less than six weeks after the date of their infant's birth, 63 percent of MOW mothers and 67 percent of non-MOW mothers had begun use of birth control. For mothers interviewed later than six weeks, those percentages climbed to about 84 percent for both MOW participants and non-participants.

Objective #3

Results related to risk reduction behaviors were examined exclusively with interview data. Among those who had smoked during pregnancy (75 non-participants and 93 participants), 65 percent of non-participants indicated they "cut down" while 67 percent of participants indicated doing so. After taking into account those who were either "serious" or "not serious" about quitting (first interview), there were no statistical differences in overall smoking status by the second interview. Furthermore, among those who reported using alcohol during pregnancy (21 non-participants and 15 participants) five non-participants and four participants indicated they either cut down or stopped drinking.

The help-seeking behaviors of mothers exposed to violence was examined at both the second and third interviews. We assumed that MOW participants would have greater opportunity than non-participants to seek help, since the program provided extended contact between the outreach worker and client. Thirty-four MOW mothers (12 percent of the second interview sample) reported being exposed to violence during pregnancy; the corresponding

number for non-participants was 28, or 11 percent of the sample.

Among those who reported exposure to violence in either the second or third interview, the percentage of MOW mothers seeking help (about 60 percent) changed very little between time periods. For the non-MOW group, the percentage of mothers seeking help declined somewhat from 58 percent in the second interview to 54 percent in the third interview.

Infants Up To Age One

The results shown in Table 1B suggest that the MOW Program had a favorable effect on some infant objectives; however, the effect was found mostly among black infants.

Objective #4

Improved births among black MOWs was a finding of the program-wide study. We estimated the number of low birthweight (LBW) and very low birthweight (VLBW) babies expected to occur over the three-year period if the MOW population shared the same degree of risk as the comparison population. For black MOW births (n=895), there were 104 LBW births and we would have expected 117 LBW births; there were 14 VLBW births and we expected 20. Also, these differences nearly achieved the traditional level of statistical significance.

By contrast, there appeared to be no improvement in birth weights among white MOWs. Among white MOW births (n=724), there were 62 LBW births and we expected 61; while seven VLBW births occurred and the same number was expected.

Objective #5

EPSDT (Early and Periodic Screening, Diagnosis, and Treatment) or well-baby care, and childhood immunizations were identified as critical aspects of child health care. Based upon program-

wide data, we found that about 81 percent of MOW and comparison infants received their first EPSDT screening within three months postpartum in health department settings. In non-health department settings, the rate was about 79 percent for both groups.

Information on use of well-baby services and frequency of immunizations was obtained from the third interview. Seventy-five percent of black MOWs and 65 percent of the comparison group reported taking their infant to a well-baby checkup at least four times during the preceding year. Among whites, a slightly smaller percentage of participants (73%) versus non-participants (75%) reported taking their infant for at least four well-child visits in the preceding year.

About 93 percent of black MOWs and non-MOWs reported taking their infant for immunization shots at least three times since birth. By contrast, white non-participants (99%) were more likely than white participants (94%) to have taken their infant for immunization shots at least three times.

Objective #6

Use of WIC services was measured as enrollment in WIC in both the prenatal and postnatal period (program-wide study). The analysis used the mother's level of education to serve as a substitute for socio-economic status. The results revealed that 81 percent of MOWs with less than a high school education and 83 percent of MOWs with a high school education or more were enrolled in both pre- and postnatal WIC; the corresponding rates for the non-MOW group were 82 percent and 84 percent respectively.

Infant Development at Age One (#7)

The Infant Monitoring Questionnaire (IMQ) was used during the third interview to determine the developmental progress of infants. Based upon maternal reports, using the 12-month IMQ assessment,

MOW babies appeared to show significantly higher skill development than comparison babies in the areas of communication, gross motor, adaptive, and personal and social skills. Moreover, significantly more comparison babies were identified as having atypical development in adaptive behavior and personal/social skills. These differences were also statistically significant.

DISCUSSION

For both the program-wide and the interview sample, MOW mothers were more likely to be found in the highest risk groups. The proportion of program-wide MOW mothers who were less than 18 years of age was noticeably higher than that of the comparison group (see Appendix A). MOW interview subjects were less likely to report that their health was "generally good" (Appendix A). That also helps explain the higher percentage of MOWs with a prior medical condition, as reported on the birth certificate.

We would expect birth outcomes to be somewhat worse among participants if no intervention had occurred, particularly in view of an elevated prepregnancy risk among MOW participants. Since, in several instances, MOW mothers tended to do better than the comparison group (favorable findings), there is justification for concluding that the MOW Program may be successfully meeting some of its objectives.

Lower than expected LBW and VLBW births and better use of well-baby services among black MOWs suggests a positive effect. These trends are also notable given the long-standing differences between black and white births in the state. Furthermore, the MOW Program appears to have a favorable effect in the area of child development at one year of age. (Additional research is needed to substantiate the latter finding, since data on infant development was based exclusively on reports of mothers.)

MOW Program measures with regard to most service-related objectives, however, appeared no different than those of the non-MOW group of MCC participants. Lack of transportation was known to be a frequent problem among participants (results not shown), which might not be overcome by MOW participation. It could also be argued that there was insufficient MOW contact during some women's pregnancies to bring about substantial differences in use of services. For participants, the average time of entry into the program was after the first trimester, at slightly more than 14 weeks of pregnancy. For some women with relatively late entry, there may not have been sufficient time to influence the use of health services.

The results of this evaluation may help provide direction for the continued development of MOW services. However, given the limitations of the study, (for example, the lack of comparability between MOW and non-MOW participants) it would not be advisable to draw conclusions about the program's overall effectiveness without additional study or other sources of information.

END NOTES

1. State Center for Health Statistics, NC Department of Environment, Health, and Natural Resources and the University of North Carolina at Chapel Hill Center for Health Promotion and Disease Prevention. *North Carolina Baby Love Maternal Outreach Worker (MOW) Program Final Evaluation Report*. September 1, 1996.
2. The Division of Maternal and Child Health, Office of Rural Health and Development. "The Baby Love Maternal Outreach Program: An Application to the Kate B. Reynolds Health Care Trust." April 1, 1991.
3. The evaluation component of the project was a cooperative venture between the University of North Carolina at Chapel Hill, Center for Health Promotion and Disease Prevention and the State Center for Health Statistics, Raleigh, NC.
4. The Kessner index is constructed from information on the length of pregnancy, the month prenatal care began (wherein most of the variation in index scores is explained), and the total number of prenatal visits. A three-point scale is derived, ranging from adequate to inadequate.

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APPENDIX A

PROGRAM-WIDE Comparisons

Combined 1992-94* Distribution of Prenatal Risk Factors Among MOW Participants, Comparison Subjects, and Statewide Population of Mothers Who Did Not Participate in Maternity Care Coordination: NC MOW Evaluation, 1996.

1992 - 1994 NC Matched Medicaid (Baby Love) Files

Prenatal Risk Factors	MOWS	Comparisons (MCC)	Statewide Pop. (non-MCC)
Less than 18 years old	31.0%	15.6%	3.4%
Less than 12th grade	65.5%	41.9%	15.0%
Not married	74.8%	63.5%	21.5%
Smoked during pregnancy	29.1%	25.4%	15.2%
Prior medical condition	31.6%	26.2%	25.4%
 Total number	 1,319	 9,255	 228,482

INTERVIEW STUDY: Selected Comparisons

Percentage of Baseline (First Interview) Characteristics for MOW Participants and Comparison Group: MOW Intensive Study, 1992-93.

Characteristic	Both Races		Blacks		Whites	
	MOW	Comparison	MOW	Comparison	MOW	Comparison
Education:						
<i>Diploma Status⁴</i>						
High school graduate	28.4 ³	48.1	28.8 ²	44.6	27.9 ³	53.2
Pursuing H.S. diploma	24.0	19.0	30.7	26.1	13.2	8.7
Employment:						
Working for Pay	11.5 ³	26.9	8.1 ³	23.0	16.9 ²	32.5
Postpartum Work Plan	76.8	78.2	76.1	82.1	78.0	72.6
Health Status:						
Health Generally Good	78.4 ¹	85.5	78.8 ¹	86.4	77.9	84.1
Regular Check-up Likely	48.1	47.4	49.1	57.1	46.6 ¹	33.3
 Total number	 343	 310	 212	 184	 131	 126

¹statistically significant at p<.05

²statistically significant at p<.01

³statistically significant at p<.001

⁴Missing Values

*Note: Information for the 1995 statewide population of MCC mothers was not available at the time of this analysis.

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