

**THE EFFECT OF PARTICIPATION IN MULTIPLE MATERNAL AND CHILD HEALTH  
PROGRAMS ON BIRTH OUTCOME**

by

**Jo Anne Durkee**

**Illinois Department of Human Services**

**Introduction**

Infant mortality remains a pressing problem in Illinois. Despite a steady decline in the statewide mortality rate since the mid-1980s, Illinois consistently ranks 44<sup>th</sup> out of the 50 states in infant mortality.

Two key factors, birth weight distribution and weight-specific mortality rates, determine the infant mortality rate. From 1985 to 1997, Illinois' infant mortality rate decreased three percentage points (11.2 to 8.2 deaths/1000 live births). These decreases were evidenced both in the neonatal and postneonatal mortality rates. These declines likely reflect two important developments: introduction of an effective treatment for respiratory distress syndrome and decrease in death from sudden infant death syndrome. At the same time, no improvement in the rate of low birth weight was reported; in fact, it increased slightly.

Evidence suggests that adequate prenatal care has a beneficial effect on improving birth weights. Prenatal care that addresses psychological (reducing or ceasing smoking and alcohol use), nutritional and medical issues is considered an effective intervention. In Illinois, these issues are addressed through two statewide programs: Family Case Management (FCM) and the Special Supplemental Nutrition Program for Women, Infants and Children (WIC).

Family Case Management services are provided to women and children through state grants to local health departments, federally qualified health centers, and community based organizations. The goals of the program are to: provide access to health care, including prenatal care, pediatric primary care, family planning services, and specialty services; identify and resolve access barriers; and provide health education. Women are referred to the program through participation in other programs, including WIC and Medicaid, and through community outreach. Once a woman decides to participate in the program, her needs are assessed by a case manager who has a bachelor's level degree (preferably in a health related field). Assessment involves dialogue between the client and case manager to assess health, social, environmental and educational needs, as well as access barriers. The case manager, together with the client, then develops an individual care plan, which focuses on the woman's areas of highest need. Through linkages with other programs and resources within the agencies themselves, case managers refer the clients to and provide them with needed services. Services are provided throughout the pregnancy and for up to one to three years after delivery. An emphasis is placed on follow-up, both in the home and in the FCM office.

The state also provides grants for WIC services. In most cases, these are to the same agencies that offer FCM. WIC provides health screening, nutrition education and counseling, supplemental foods and information about other health services. Those eligible to receive the services are income-eligible pregnant, breastfeeding and postpartum women, and infants and children up to five years of age with medical and nutritional risks. Participants receive food packages based on nutritional needs. WIC foods include milk, cheese, eggs, adult and infant cereal, juice, peanut butter, tuna, carrots, beans and infant formula. Participants obtain food by redeeming the coupons at WIC approved grocery stores and food centers.

The purpose of this study is to examine the effect of participation in both the WIC and FCM programs on birth outcomes as compared to that for participation in only one of the two programs. Low birth weight and infant mortality rates will be compared for women participating in both WIC and FCM, WIC only, FCM only and Medicaid.

## **Methodology**

Data Sources. Three major data sources were used to conduct the analysis: Cornerstone, Vital Records and the Medicaid Management Information System (MMIS).

Cornerstone is a management information system developed and implemented by the Illinois Department of Human Services as a mechanism to facilitate maternal and child health service

integration. The system supports the delivery of the following services: WIC, FCM, prenatal care, pediatric primary care, breast and cervical cancer screening and childhood immunizations.

Cornerstone's design and technical architecture features many new approaches to administering maternal and child health services:

- \$ A common enrollment component in which demographic and eligibility information specific to a client is captured once and available to all other service providers participating in Cornerstone.
  
- \$ An automated care plan that generates service goals based on a client's response to a standardized series of questions assessing prenatal or child health care, nutrition, child safety or other human service needs.
  
- \$ A referral process using a locally developed listing of resources organized by service type that allows the case manager to link the client to a local service providers.
  
- \$ A wide-area network that allows Cornerstone users access to service history data (e.g. immunization history) in the frequently occurring event of clients changing place of service.

The system was completely installed across the state by 1997. It is a PC and local area network-based system distributed to over 300 separate community health service locations. The LANs support 2 to 30 workstations per service location. Locally collected client information is transmitted to the State (Springfield) nightly for central processing. Interfaces with the Illinois Departments of Public Aid and Children and Family Services identify clients eligible for case management services and in need of follow-up.

Vital Records were also used. Death records were matched to birth records of infants born in 1997. During that year, there were 180,649 live births and 1,372 infant deaths in Illinois.

To examine the effect of program participation on birth outcomes, client service records were linked to those of the Vital Records matched birth-death file. Cornerstone was analyzed to 1) select clients who were pregnant and delivered in 1997; 2) match this data to that of clients born in 1997; and 3) determine program participation for the prenatal clients. These data were then linked to the matched birth-death file through a complex algorithm utilizing the infant's first and last names, date of delivery and mother's first and last or maiden names. A matching rate of 98 percent was achieved. Additionally, using the same matching criteria to identify all women with a hospital delivery claim paid for by Medicaid during calendar year 1997, the MMIS files were linked to the previously linked Cornerstone-Vital Records file.

Analysis. Crude rates of very low birth weight (VLBW) and infant mortality were examined for

FCM only, WIC only, FCM and WIC, and Medicaid participants; all others or the general population; and Illinois. Several comparisons of these rates were conducted using Chi-square tests.

## **Results**

Of the total number of live births reported in Illinois for 1997, 67,573 or 37.4 percent participated in FCM, WIC, or both programs. With the addition of 13,161 Medicaid births, State-sponsored programs served 44.7 percent of all births. An examination of the distribution of live births by program participation and selected demographic characteristics as presented in Table 1 suggests that State-sponsored programs serve most of at-risk births, as determined by maternal age, marital status and race. Together, State-sponsored programs served 88 percent of births to teens, 85 percent of births to single women, and 82 percent of births to black women. These programs served 36% of births to white women.

Table 2 presents VLBW rates by program participation. Participants enrolled in both FCM and WIC reported a VLBW rate of 1.3 percent while those in FCM only and WIC only reported rates of 2.4 and 1.4 percent, respectively. These differences were statistically significant at the  $p < .05$  level. For Medicaid participants, the VLBW rate was 3.9 percent. As compared to infants whose mothers enrolled in both FCM and WIC, the rate for Medicaid births was significantly greater at  $p < .05$ . All remaining births had a VLBW rate of 1.4 percent. Illinois' VLBW rate was 1.6 percent.

Infant mortality rates by program participation are presented in Table 3. Clients participating in both FCM and WIC had infant mortality rates of 6.5 per 1,000 live births as compared to 13.1 and 6.3 for FCM only and WIC only clients, respectively. These comparisons yielded a statistically significant finding at  $p < .05$  for the difference in mortality rates for those infants whose mothers enrolled in both programs and those who enrolled in FCM only. No statistical difference was observed for those enrolled in both programs and those in WIC only. The infant mortality rate for Medicaid recipients was 14.6 deaths per 1000 live births, and for the general population it was 6.8. For the state, the rate was 7.6.



**TABLE 1**  
**DISTRIBUTION OF LIVE BIRTHS BY DEMOGRAPHIC**  
**Characteristics of Mother and Program**  
**ILLINOIS, 1997**

**Demographic Category of Mother**

<b>Groups</b>	<b>Teen</b>	<b>Single</b>	<b>Black</b>	<b>White</b>	<b>All</b>
<b>State Sponsored Programs</b>					
<b>FCM Only</b>	2,016	6,086	3,011	6,936	9,947
<b>WIC Only</b>	5,170	12,885	9,860	11,153	21,013
<b>FCM/WIC</b>	9,813	22,480	9,430	27,183	36,613
<b>Medicaid</b>	3,006	9,847	6,707	6,454	13,161
<b>General Population</b>	2,641	9,103	6,414	93,501	99,915
<b>ILLINOIS</b>	22,646	60,401	35,422	145,227	180,649

Table 2

**RATES OF VERY LOW BIRTHWEIGHT (<1500 Grams)  
BY PROGRAM PARTICIPATION,  
General Population and Illinois  
1997**

<b>Groups</b>	<b>Rate/100 Live Births</b>
<b>State-Sponsored Program</b>	
FCM Only	2.4
WIC Only	1.4
FCM & WIC	1.3
Medicaid	3.9
<b>General Population</b>	<b>1.4</b>
<b>ILLINOIS</b>	<b>1.6</b>

**Table 3**

**RATES OF INFANT MORTALITY  
BY PROGRAM PARTICIPATION,  
General Population and Illinois  
1997**

<b>Groups</b>	<b>Deaths/1000 Live Births</b>
<b>State-Sponsored Programs</b>	
FCM Only	13.1
WIC Only	6.3
FCM & WIC	6.5
Medicaid	14.6
<b>General Population</b>	<b>6.8</b>
<b>ILLINOIS</b>	<b>7.6</b>

## **Discussion**

The results of this study suggest that participation in both FCM and WIC improves birth outcomes among at-risk women. In comparison with infants born to women participating in FCM only, infants enrolled in both WIC and FCM had statistically significant lower rates of VLBW and mortality. Infants born to women participating in WIC only evidenced similarly low incidences of VLBW and mortality, as did infants whose mothers were enrolled in both FCM and WIC. There were no statistically significant differences in outcome measures for the two types of participant groups. Outcomes for infants whose mothers participated in Medicaid were significantly poorer than for infants whose mothers participated in both FCM and WIC. Finally, dual participation evidenced better birth outcomes than those reported for the general population and the state as a whole.

In this type of study, in which random assignment of clients to treatment and control groups is not possible, there is the possibility of selection bias. Perhaps characteristics prompting enrollment in both programs (such as education, social support network and other resources) also are associated with the outcomes observed. Another source of selection bias may have occurred through method of referral to the programs. Women were referred to the programs by two methods, through the Department of Public Aid and by community outreach. The Department of Public Aid on a monthly basis transferred the names of all known pregnant women on Medicaid from the MMIS to Cornerstone; these women were then contacted by the local health agency. This method of outreach

was very effective in reaching women who became eligible for Medicaid by becoming pregnant. Many women, however, were on Medicaid prior to becoming pregnant, namely, AFDC recipients. Because only files of women on Medicaid and known to be pregnant were transferred to Cornerstone, pregnant women on AFDC may have been missed.

## **Conclusion**

Despite these concerns, the Division of Community Health and Prevention considered the results extremely significant. The concept of improved health outcomes through integrated service delivery seemed to be substantiated. Accordingly, the Division established policies and procedures to require local agencies that provide WIC and/or FCM to insure the delivery of both programs to clients. Each quarter, a map is distributed statewide to providers of WIC and FCM designating the status of agencies in enrolling up to 95 percent of clientele into both programs. Division staff work closely with agencies that enroll less than 95% to develop action plans that will improve dual enrollment. Several local agencies have reorganized, combining the staff of each program into one service delivery team. Others have developed strong administrative agreements which allow them to refer and schedule clients for one another's services.

The changes in local service delivery based on these findings are broad. Because of the nature and extent of the changes, the Division expects continued improvement in birth outcomes for women and children who participate in its maternal and child health programs.