Project MotherCare: One Hospital's Response to the High Perinatal Death Rate in New Haven, CT

WILFRED REGUERO, MD
MARILYN CRANE, CNM, MS

Dr. Reguero is Chairman, Department of Obstetrics and Gynecology, Hospital of Saint Raphael, and Associate Clinical Professor of Obstetrics and Gynecology, Yale University School of Medicine. Ms. Crane is Assistant Professor, Yale University School of Nursing, Adult Health Division, Nurse-Midwifery Program.

Tearsheet requests to Wilfred Reguero, MD, Hospital of Saint Raphael, 1450 Chapel St., New Haven, CT, 06511, telephone 203–789–3661, FAX 203–867–5203.

Synopsis

Startling national statistics indicate that New Haven, CT, is the seventh poorest city of its size, in terms of per capita income, in the United States. In 1989, it was reported to have the highest rate of infant mortality—18.5 infant deaths per 1,000 live births—in the nation for a city with more than 100,000 people.

Seventy-five percent of all perinatal deaths are attributed to low birth weight infants. Adequate prenatal care is a proven means of reducing this risk. To further compound the problem, substance abuse among pregnant women has increased dramatically. Census tract data revealed that many of the infant deaths were localized to several well-defined areas of the city. Forty-four percent of the infant deaths were ascribed to extreme immaturity or other causes related to low birth weight.

Approximately 21 percent of the pregnant population had either no prenatal care or care was begun late—after the first trimester. The traditional avenues for prenatal care have been ineffective; an innovative approach, one that can be replicated, was initiated.

The Hospital of Saint Raphael's "Project MotherCare" embarked on an initiative to address these problems by reducing the access barriers to prenatal care regardless of insurance status or ability to pay. The mission was twofold: (a) to bring prenatal care to underserved neighborhoods of New Haven and (b) to identify the substance-abusing pregnant woman and deliver a continuum of services including prenatal care, counseling, social services, and referral to a drug treatment program. Community need caused the program to expand beyond prenatal services and provide additional primary care services to other residents of these neighborhoods.

NEW HAVEN is the seventh poorest city of its size, population 130,000, in the United States (*1*). There are high rates of unemployment, crime, illicit substance abuse, and teen pregnancy, as well as low educational achievement, poor housing, and many single parent households (*2,3*). In 1989, it was reported to have the highest rate of infant mortality (18.5 infant deaths per 1,000 live births) in the nation for a city with more than 100,000 people (*3,4*). Thirty-one of the 47 deaths of resident infants (66 percent) occurred within the first 28 days of life.

Forty-four percent of the infant deaths were ascribed to extreme immaturity or other causes related to low birth weight. Census tract data revealed that many of the infant deaths were localized to several well-defined areas of the city; for example, in one neighborhood the infant death rate was 66.7 deaths per 1,000 births. During this time, the city reported that approximately 21 percent of the pregnant population had either no prenatal care or care was begun late—after the first trimester of pregnancy (*3*). Finally, maternal use of cocaine, as well as the high incidence of sexually transmitted diseases, syphilis and human immunodeficiency virus (HIV), have also been associated with the city's high infant and perinatal death rate (*2,5,6*).

Although New Haven has an extensive health care system—two hospitals and four outreach clinics—service network health care providers have been unable to reach out to patients who contribute to unfavorable infant and perinatal mortality outcomes. Unfortunately, when one studies the city's medical triangle where these facilities are located, it is apparent that large areas of the city are a considerable distance from existing services. Reaching the medical triangle requires taking two buses and at least 1 hour traveling time.

The most peripheral areas in the city have no bus

Table 1. Numbers of medical care services at Project MotherCare's Neighborhood Mobile Clinic, December 1, 1990, to September 30, 1992

Services	*FY 1990–91*	*FY 1991–92*
Gynecology:		
New patients	66	101
Return patients	7	19
Serum pregnancy	76	175
Prenatal:		
New patients	54	70
Return patients	227	276
Deliveries:		
Hospital of Saint Raphael's patients	22	28
Yale New Haven Hospital's patients	5	2
Patients at home	1	0
Post-partum care	17	26
Adult primary care:		
New patients	150	171
Return patients	25	48
Blood pressure screening:		
New patients	178	115
Return patients	63	105
Blood work and urine analysis: [1]	2,527	3,524
Toxicology screen: tested	860	679
Toxicology screen: tested positive	80	47
HIV screening: tested	127	185
HIV screening: tested positive	7	3
Serum alcohol: tested	27	77
Serum alcohol: tested positive	12	3
Immunization	39	601
Social services, drug counseling:		
New patients	403	324
Return patients	372	567
WIC, nutrition counseling:		
New patients	302	319
Return patients	222	269
Pediatric:		
New patients	316	444
Return patients	27	81
Acupuncture:		
New patients	193	120
Return patients	715	545
Referrals	355	297
Total services performed	6,334	8,317
New patients	977	1,457
Total patients seen	2,469	2,765

[1] Includes all blood screenings and urine anaylses.

line to link them to the outer perimeter of the city and to the downtown area. Some areas have no community health centers for the people to access. In other areas, health centers have limitations on the number of clients they can see, or they have other restrictions which limit their ability to impact sufficiently on health care needs. In addition, the surrounding communities, such as West Haven, have no public transport to the medical triangle and have no free-standing clinics in the entire region.

Although church and school facilities are available, they are not easily or economically transformed into neighborhood medical clinic sites. The costs associated with such an improvement in service are prohibitive, especially in cities such as New Haven that are skirting bankruptcy. The mobile van provides an important resource for these communities.

Project MotherCare is a response of the Hospital of Saint Raphael to the high infant death rate. This report is an initial description of the Neighborhood Mobile Clinic component of Project MotherCare and provides preliminary data as to the impact of such a program after 2 years of operation. The project's second component is a clinic program which is held at the hospital three evenings per week. A description and preliminary data from this phase of the program will be described in detail in a subsequent paper.

Description of Project MotherCare

The mission of Project MotherCare's Mobile Clinic Program is twofold: (*a*) to bring prenatal care to the underserved neighborhoods of New Haven and (*b*) to identify the substance-abusing pregnant woman and deliver a continuum of services including prenatal care, counseling, acupuncture, referral to a drug treatment program, and social services. The underlying premise was that even though the city was and still is served by two excellent hospital facilities, the traditional approach to prenatal care apparently has had no impact on the infant mortality rate.

The mobile clinic is a custom-made, 58-foot tractor trailer on wheels which we euphemistically call the van. Working space includes two examination rooms, three lavatory facilities that will accommodate disabled clients, four offices, and a small waiting area. The van's team comprises a physician assistant-acupuncturist, part-time pediatrician, Special Supplemental Food Program for Women, Infants and Children (WIC) nutritionist, social service-substance abuse counselor, registrar-receptionist, phlebotomist, driver, and an environmental control worker. The latter two team members also provide security for the van.

This clinic travels to seven or eight impoverished neighborhoods in New Haven each week on a regular schedule. Every effort has been made to work collaboratively with all the providers in the New Haven region. The City of New Haven, through the Mayor's office, have been active participants in the implementation of the project. By using the resources of the health department and present free-standing clinics, we have worked closely to determine the best locations to access the indigent clients and the persons most in need of services. We have received numerous requests from the surrounding greater New

Haven area to provide services to their citizens as well.

Clients are seen on a walk-in basis. Appointments are not required because it is our view that they serve as a barrier to clients availing themselves for care and services. Clients are screened on initial intake visit, when a comprehensive patient questionnaire is completed, and a determination and plan of treatment is made in response to their short- and long-term health and psychosocial needs.

Services provided on the van include initial and return prenatal visit care, sexually transmitted disease screening and treatment, primary care for both men and women, pediatric care, immunizations, HIV counseling and testing, screening of blood samples, acupuncture treatment for substance abuse, nutrition and psychosocial counseling, and enrollment in the WIC Program. Every effort is made to provide comprehensive care and to link clients into hospital-based medical services, as well as community services or programs. Review of preliminary screening information has revealed that the majority of clients seen on the van do not have regular health care providers.

All persons who visit the van are eligible for services regardless of their ability to pay. Attempts are made to provide for each person's immediate needs. All full-time staff perform outreach and frequently go door-to-door to acquaint area residents with the van and to encourage them to use this service. Transportation for the staff and clients is provided by a minivan. When necessary, clients are transported to the van or to the two area hospitals for special procedures or tertiary care. Any client needing services when we are not on site in their community may call, and our minivan will transport them to and from the van or the hospital if that is necessary for them to receive adequate care.

Program Funding

The Hospital of Saint Raphael funds Project MotherCare with the help of a Maternal-Child Health Project grant from Connecticut's Commission on Hospitals. The project was started with $500,000, including a one-time expenditure of $140,000 for the construction of the van. Project MotherCare was also the recipient of a grant that provided funds for the purchase of the minivan.

Preliminary Results

Table 1 details the raw data collected for the first 2 years of this demonstration project from December 1990 through September 1992. A total of 5,234 people have received care at the van. Approximately 75 percent of the clients are black. There was a 49 percent increase in the number of new clients during the second year of operation.

'All persons who visit the van are eligible for services regardless of their ability to pay. No one is turned away without an attempt being made to provide for their immediate needs. All full-time staff perform outreach and frequently go door-to-door to acquaint area residents with the van and to encourage them to use this service.'

Interestingly, the majority of our clients were seen for primary (pediatric and adult) care; a total of 14,651 services were provided. For example, approximately 5.6 percent of the clients at initial visit requested blood pressure screening for hypertension; of this group, 127 (43 percent) had elevated blood pressure. All of these clients were introduced into the health care system at a local facility or received followup care at the van. The incidence of hypertension was comparable to the national rates estimated at 38 percent for blacks (*7*).

A total of 151 clients were screened for diabetes; 57 (37 percent) were pregnant. Seven percent of the prenatal clients were found to have diabetes. In the nonpregnant group, 15 females and 8 males, the prevalence of diabetes was 24 percent.

Substance abuse-social service counseling is provided by the van staff. Counseling is available to all clients, including males and nonpregnant females. Referrals are made to several programs, both outpatient and residential types. The Hospital of Saint Raphael has an evening and day substance abuse facility and maintains close ties to other citywide programs.

HIV counseling and testing is another project service; 312 clients were screened for HIV infection with a positive rate of 3.2 percent. It is suspected that this rate may be greater because often clients at high risk for HIV infection refused testing. Their refusal may indicate that they knew their HIV status, were fearful of the repercussions if they tested positive or, for whatever reason, were simply not interested in knowing their HIV status.

Substance abuse has rapidly increased in the city's

Table 2. Number of prenatal substance abuse patients at Project MotherCare's Neighborhood Mobile Clinic

Kind of services	FY 1990–91		FY 1991–92	
	Number	Percent	Number	Percent
Prenatal:				
New patients	54	100	70	100
Positive on first visit	16	29.6	18	25.7
Deliveries	28	100	30	100
Positive at delivery	8	28.5	5	16.6

Table 3. Ethnic background and insurance status of prenatal patients at Project MotherCare's Neighborhood Mobile Clinic

Category	Number	Percent
Ethnicity:		
Black	97	75.2
Hispanic	10	7.8
White	9	7.0
Other, including noncitizen	13	10.0
Insurance status:		
State	77	59.7
Healthy Start	9	7.0
Citycaid	5	3.9
Private (such as the Blue Cross)	3	2.3
Uninsured	35	27.1

Table 4. Ethnicity and kind of insurance of patients at Project MotherCare's Neighborhood Mobile Clinic

Ethnicity	Percent
Black:	
State	68.0
Healthy Start	7.2
Private	2.1
Citycaid	5.2
Uninsured	17.5
Hispanic:	
State	50.0
Uninsured	50.0
White:	
State	44.4
Uninsured	55.6
Other:	
State	15.4
Healthy Start	15.4
Private	7.7
Uninsured	61.5

population (*6*). While it is our intent to identify and refer patients to traditional substance abuse programs, we are using acupuncture of the ear as supportive therapy for these clients. We have found that acupuncture has encouraged some clients to take advantage of other interventions that are available in more traditional settings. Approximately 30 percent of our clients who receive acupuncture treatment have reduced their substance use as monitored by urine screening for drugs. In addition, it was found that clients using acupuncture for cessation of cigarette smoking stopped smoking for the period they were in the program.

Sixteen percent of all clients came for pediatric care, and 74 percent of them needed and received the necessary childhood immunizations. To meet the demand for pediatric care, a part-time pediatrician was added to the van's team in its second year.

Project MotherCare was sensitive to the need for nutritional support in the communities we were preparing to visit. During the 2 years of operation, almost 25 percent of the new clients visiting the van initially came for WIC services and nutritional counseling. Of the total number of prenatal clients seen, 21 percent came to the van requesting WIC services.

A total of 251 serum tests for pregnancy have been performed, and 124 clients testing positive registered for care on the van. The initial prenatal visit begins with a series of questions regarding demographics. At that time a thorough and complete history is taken, including any patterns of drug dependency. A risk assessment and problem list is developed, and an extensive physical is performed. Following the initial visit, it is determined whether a referral to one of the several free-standing sites for care is feasible or continuing care should be given by the van staff. Clients' wishes are taken into account to encourage them to continue to access the health care system.

To identify the substance abusing pregnant clients, urine toxicology screenings are performed at the first prenatal visit, every subsequent trimester, and again on admission to labor and delivery. Informed consent is obtained for each client. If clients refused, screening was done anonymously; only one client has declined screening to date.

Table 2 provides an overview of prenatal registrants' toxicology status. The clients with positive findings at delivery had an average of four prenatal visits; the clients that had negative screens for drugs averaged 7.4 prenatal visits.

The chi-square test was not significant ($P = 0.628$) between years 1 and 2 for positive urine drug screens that were performed at the first prenatal visit. Upon admission to labor and delivery, there was also no significant difference ($P = 0.164$). In the second year of service, the rate of positive urine tests decreased from 28.5 percent to 16.6 percent at time of delivery.

According to the results of a survey among the clients of Project MotherCare, 75.2 percent were black, 7.8 percent were Hispanic, 7 percent were

white, and 10 percent were classified as other, which included some noncitizens (table 3). Approximately 27 percent of the van's clients had no health care insurance, or were underinsured, and therefore had limited access to the traditional health care system.

Insurance status of this group is shown in table 3. In accordance with Federal poverty level guidelines, State, Healthy Start, and Citycaid are programs that provide health coverage for pregnant women (table 4), infants from 0–12 months at 185 percent of poverty level, children 1 to 6 years at 133 percent, and 7 to 8 years at 100 percent. Regular Medicaid in Connecticut provides coverage at 85 percent of poverty for other segments of the population.

Each visit may have multiple components. A visit with the nutritionist would be considered a service. An examination by the physician assistant would also be considered a service. The cost per service was estimated at $16 and the cost per visit was approximately $43.

Although we cannot claim to have dramatically impacted on the death rate in New Haven, we can point out that our efforts have changed the death rate in our own community hospital. According to State data, New Haven's infant death rate decreased from 18.5 per 1,000 live births in 1989 to 10.9 per 1,000 live births in 1990. Figure 1 demonstrates the slow but dramatic decrease in perinatal deaths at the Hospital of Saint Raphael. As yet, these changes cannot be directly linked to Project MotherCare interventions. Nevertheless, we believe that there has been some spill-over effect that has caused us to be much more aware of the need for comprehensive prenatal care, and it has changed our practice in such a manner that has allowed for the reduction seen.

Figure 2 illustrates the distribution by race of the perinatal deaths at the Hospital of Saint Raphael during the years 1990 to 1993. Compared with statewide data, the relationships between the groups are essentially the same. Connecticut has an excellent perinatal death rate for whites, 4.8 per 1,000 births from 1990 through 1993. Its perinatal death rate for whites is third lowest in the country, but the State ranks approximately 27th for perinatal deaths among the black population. Data for the Hispanic population of the State are not readily available and has not been tracked adequately over the years.

The explanation as to why these rates are so disparate between the races remains as yet unanswered. It is believed that these differences are rooted in unequal opportunity for jobs, education, and collectively the failure of our society to ensure access to an improved socioeconomic standard of living for all our citizens.

Figure 1. Hospital of Saint Raphael's perinatal death rate per 1,000 births

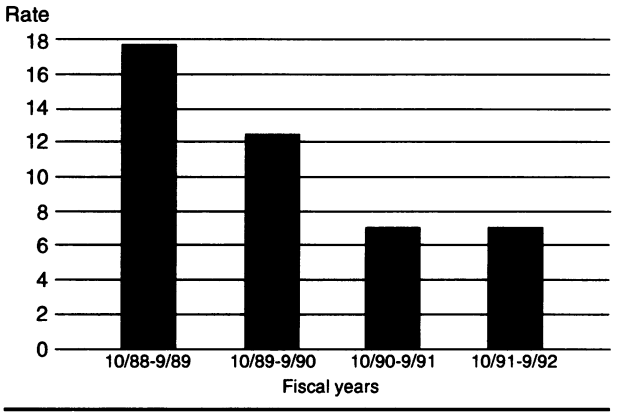
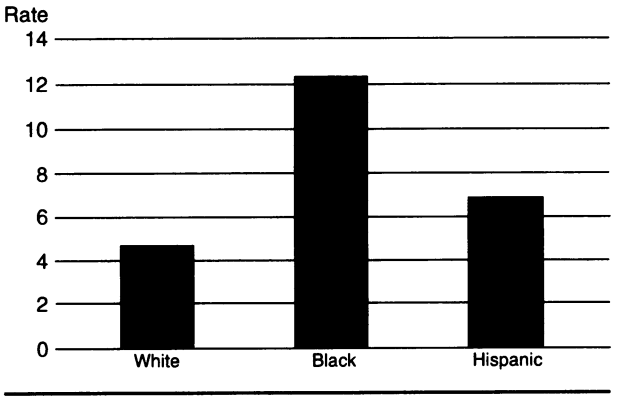


Figure 2. Hospital of Saint Raphael's perinatal death rate per 1,000 births by race, 1990–93



Discussion

Project MotherCare had, as its primary initiative, developed the Neighborhood Mobile Clinic to provide health care in impoverished, underserved areas that have demonstrated high infant and perinatal mortality rates.

It was discovered that there was a major gap in the delivery of primary care services to the impoverished communities of New Haven and its surrounding municipalities. In a very short time, it became apparent that the large numbers of clients coming to the van had all kinds of health needs; many of them would have otherwise been outside the mainstream of the health care system. Community need caused the program to expand beyond prenatal services. This initiative has not only reduced the barriers to delivering prenatal care but, subsequently, has been a major source of primary health care to the people of these afflicted and affected communities.

The infant mortality rate in New Haven serves as a

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barometer of the overall health care system. Although we never changed the focus of our efforts—to reduce perinatal and infant deaths—we did in fact shift gears and embarked on a serious attempt to meet other needs of the underserved, impoverished communities we visit. By reducing the barriers to care for prenatal, pediatric, and adult primary clients, we are providing an avenue of access into the health care system for persons most in need. The high rates of hypertension and diabetes detected help to validate our outreach program in the identification of these clients in the hope of aborting some of the serious sequelae attributed to their disease processes.

There is no doubt that WIC is a very important aspect of our program. It provides a desperately needed support service and helps to gather clients who are difficult to reach, enabling us to deliver comprehensive services offsite.

Interventions such as Project MotherCare provide us with a snapshot of primary health care needs in the very neighborhoods that have high perinatal and infant deaths. In view of the fact that all clients are seen on the van regardless of their ability to pay, one can readily see why the program has met with such great acceptance.

Our numbers are as yet too small to evaluate adequately morbidity and mortality data and the various other needs that we are addressing. Our project demonstrates that although there are services available in the city, if they are not easily accessible, the indigent can make little use of many obtainable interventions.

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