Project to Improve Child Health in a Health District of South Carolina

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APPROXIMATELY 900 BABIES who were born alive in 1979 in South Carolina died before their first birthday; another 600 babies were stillborn. For every 1,000 infants born in that year, 18 did not reach their first birthday. This tragic record ranks South Carolina 49th among the 50 States in infant mortality. Infant mortality rates are only a gross indicator of the real problem in South Carolina, because for every baby who dies, it is estimated that three babies will live with lifelong handicapping conditions that are preventable.

Improved Child Health Projects

To help reduce infant mortality and the significant prevalence of maternal and infant mortality in some parts of the United States, the Bureau of Community Health Services, Health Services Administration, Department of Health and Human Services, has allocated supplemental funds to selected State maternal and child health programs. The States have used the funds to design Improved Child Health Projects (ICHP) targeted on groups of counties with persistent problems in maternal and child health. The objectives of the projects are (*a*) to set up a coordinated-integrated system of comprehensive health care for mothers and infants; (*b*) to demonstrate the effectiveness of the targeting of resources to selected areas of a State in order to have an impact on a significant problem, and (*c*) to clarify the roles and interrelationships of public, private, and academic partners in solving persistent and resistant problems in maternal and child health.

Services to be delivered through the Improved Child Health Projects have included:

- outreach activities with emphasis on early identification;
- triage through a risk-scoring system for mothers and infants;
- primary health care services, including prenatal, postpartum, and intraconceptual care;
- infant care with referral of high-risk infants and infants with disabilities to specialized service programs;
- hospital care available in accordance with risk status;
- specialized services such as nutrition, social work, dental care, medical and surgical specialties, and laboratory studies;
- supportive services, such as patient education, food assistance (WIC—women, infants, and children's supplemental nutrition programs), day care, home health, homemaker, and transportation;
- preventive services designed to prevent disease and disability and promote health maintenance, such as early casefinding, screening, family planning, prenatal care, immunization, nutrition, dental care, and education;
- coordination and linkages with primary care providers and medical schools for specialized services and programs supported by Title V funds.

Pee Dee II Health District

In October 1978, the Bureau of Maternal and Child Care of the South Carolina Department of Health and Environmental Control (S.C. DHEC) was awarded 1 of 15 grants for Improved Child Health Projects

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for use in the Pee Dee II Health District, a 3-county (Chesterfield, Darlington, and Marlboro) rural area in the northeastern corner of South Carolina.

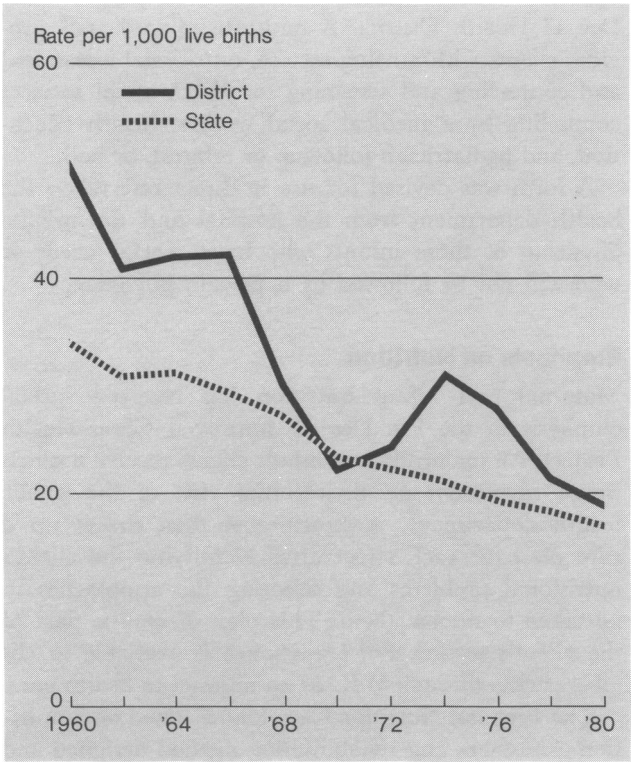
The population of the Pee Dee II area is approximately 120,000; 61 percent of the population is white and 39 percent nonwhite. The population is 73.2 percent rural, and the per capita income is $3,600. Approximately half of the population is at or below 150 percent of the poverty level. Among adults aged 25 and over, 18 percent have less than a fifth grade education (functional illiterates) and 71 percent have less than a high school education (undereducated) (*1*).

The Pee Dee II District is a health manpower shortage area; one county (Chesterfield) has no obstetrician nor pediatrician, and another (Marlboro) has only one obstetrician and one pediatrician.. There are five private hospitals in the area that provide perinatal health care services.

Pee Dee II's Perinatal Health Problems

In 1978, the Pee Dee II Health District had an infant mortality rate of 21.8 per 1,000 live births, well above the State rate of 18.5 per 1,000 live births and in excess of the national rate of 13.6 per 1,000 live births. Of the infant deaths in Pee Dee II in 1978, 48 percent occurred in the first 24 hours of life and 81 percent within the first 28 days. Pee Dee II's neonatal mortality rate of 17.2 per 1,000 live births was above the State rate of 12.4 per 1,000 live births, and the district ranked second highest in the State in neonatal mortality. As seen in figure 1, infant mortality rates in the Pee Dee II area consistently have been higher than the State rates over the past 20 years.

Figure 1. Infant mortality rates for the Pee Dee II Health District of South Carolina, 1960–79



Factors that contribute to the poor perinatal health and account for the excessive perinatal mortality in the Pee Dee II Health District include a high rate of low-birth-weight infants, inadequate prenatal care, low socioeconomic status, poor nutrition, lack of perinatal education, limited physician and institutional care capabilities, lack of appropriate risk identification and referral, and lack of transportaton.

Improved Child Health Project in Pee Dee II

The Federal resources available for the Improved Child Health Project in the Pee Dee II district included: (*a*) $300,000 per year for 4 years of Maternal and Child Care funds authorized under Title V of the Social Security Act; (*b*) $80,000 of Federal family planning funds (for the first year of the project), authorized under Title X of the Public Health Service Act: (*c*) designation of the Pee Dee II service area as a primary site for National Health Service Corps assignments; and (*d*) placement in the district of Rural Health Initiative (RHI) projects authorized under Section 330 of the Public Health Service Act.

The goal of the Pee Dee II ICHP is to demonstrate the effectiveness of a multidisciplinary approach in decreasing infant mortality rates in Chesterfield, Darlington, and Marlboro Counties to at least the 1977 State rate of 17.6 per 1,000 live births. The specific objectives of the project are:

- to ensure that all pregnant women and infants have the appropriate level of care,
- to coordinate existing health care services to improve the quality of care and make effective use of resources,
- to increase community awareness of perinatal health care issues and problems,
- to upgrade the knowledge and skills of health service providers in both the private and public sectors,
- to monitor the vital statistics and pregnancy outcome measures in the district's service area.

The Improved Child Health Project has been integrated with existing programs of the South Carolina Department of Health and Environmental Control, especially its family planning, maternal and child care, and WIC programs. The activities of the project have been coordinated with other State agencies and programs in the Pee Dee II communities. Written agreements were reached between the ICHP staff and staffs

of Rural Health Initiative Projects functioning in the area in an effort to promote better communication, referral, and collaboration among all those providing health care to perinatal clients in the Pee Dee II Health District. The ICHP staff also has consulted with private physicians, National Health Service Corps assignees, and staffs of hospitals and service agencies to facilitate continuity in the planning and implementation of specific approaches to the district's perinatal health problems. In addition, the ICHP staff has received support from, and cooperated with, the Pee Dee Area Regional Health Systems Agency, Inc., which has served both as a project review body and as a resource for addressing perinatal health care in the entire Pee Dee area (12 counties).

Advisory Task Force and Council

A task force was organized in the Bureau of Maternal and Child Care (MCC) to serve as an advisory and consultant group for the ICHP. This task force is comprised of the MCC's bureau chief and other MCC staff, including a nutritionist, a social worker, a health educator, the director of the Improved Pregnancy Outcome Project, the director(s) of the family planning program and of the maternal and child health programs, an evaluation and management consultant, an obstetrician-gynecologist consultant, and a fiscal consultant.

A local advisory council with lay, professional, and consumer representatives was established for the project by expanding the existing Family Planning Advisory Council so that it could serve the goals of both projects. This council addresses perinatal health care issues in the three-county Pee Dee II area and provides a broad-based community coalition to promote perinatal health.

Increase in Perinatal Services and Personnel

The Improved Child Health Project has made it possible to recruit and hire a cadre of health professionals to provide perinatal health services for Pee Dee II area residents through the public health system. This cadre includes four community health nurses, a nutritionist, two community health aides, four clerks, a health education assistant, and a staff assistant. A certified nurse midwife-family nurse practitioner, a pediatrician, a health educator, and a social worker have also been assigned from the National Health Service Corps.

The Improved Child Health Project also has provided for an increase in perinatal health services in all public health departments in the Pee Dee II Health District. Each of the major public health centers now has maternity, infant and child health, WIC, and family planning services available. Also, throughout the district, prenatal clinics have been increased to once weekly, and monthly prenatal clinics have been initiated at convenient hours (3 to 7 pm) to meet the needs for prenatal services of the school-aged and of working women.

A multidisciplinary staff provides all perinatal clients with the following health care services: nursing services and counseling; examination by a physician, a certified nurse midwife, or both; social services counseling and certification for WIC (if eligible); and health education. Additional medical evaluation, consultation, and screening are also obtained for the individual client as needed.

Each maternity client is assessed by means of the Maternity High Risk Score Sheet of the S.C. DHEC to identify those clients with a problem or condition (physiological, emotional, or social) that might adversely affect the delivery of a healthy, full-term baby and also to determine whether she might qualify for the funding of high-risk maternity care. Prenatal clients judged to be at high risk are referred for care either to the Perinatal High Risk Clinic in Florence (outside the Pee Dee II Health District) or to an obstetrician-pediatrician team in Marlboro County. Transportation to the clinic, the physician's office, and the hospital is arranged for every high-risk maternity client in need of the service.

Separate clinic services for infants under 1 year of age have been established in each county in the Pee Dee II Health District. A multidisciplinary staff provides clients with nursing service, nutritional assessment and counseling and screening for WIC, social services counseling by a medical social worker, health education, and pediatrician followup or referral, or both.

A form was devised for use in direct referral to the health department from the hospital and the private physician of those infants who have special needs or who will not be followed by a private physician.

Emphasis on Nutrition

Maternal and infant nutrition has received special emphasis in the Pee Dee II Improved Child Health Project. All maternity and infant clients receive a nutritional assessment on their initial visit to the public health department. A nutritionist then draws up a care plan for each client after identifying the client's nutritional problems and selecting the approaches to be taken to resolve them. This plan of care is part of the client's record. Food assistance is available to eligible clients through WIC as an adjunct to health care.

The Prenatal Nutrition Care Plan is based on a nutrition assessment and rehabilitation method designed and

tested by Agnes Higgins of the Montreal Diet Dispensary, Montreal, Canada. This method (see box) includes calculation of the client's individual protein requirement, which is compared with the client's actual protein intake. Counseling by the nutritionst is directed at getting the client to eat foods that would eliminate any protein deficits. Usually these deficits can be corrected by the addition of WIC foods to the client's diet.

Based on current recommendations of the American Academy of Pediatrics, an infant feeding guide also was prepared, which is used in nutrition classes and infant clinics. In this guide, the recommended feeding schedule for the infant is outlined, and particular attention is given to the age for introducing solid foods into the child's diet.

All maternity clients are screened for WIC eligibility. To ensure that each client is in a system of prenatal care, clients obtain the medical data required for this certification either from their private physician or through the health department's maternity clinic. Those clients who are seeing a private physician are given a letter that the physician must complete and sign.

Health Education

Health education has been an integral part of all activities in the Pee Dee II ICHP effort and has included classes and individual counseling in the public health clinics, reproductive health education in the schools, the preparation of resource materials, inservice education, community education, consultation, and technical assistance.

A comprehensive eight-class curriculum was written for use in the health department's maternity clinics. Classes are offered at each clinic based on the clients' individual needs.

The primary strategies that have been adopted in addressing the educational needs of the community have been the media, educational programs, and literature. Increasing the community's awareness and knowledge of perinatal health care and the issues and problems related to it has been a major effort of the Improved Child Health Project. The project staff, in cooperation with the Pee Dee Area March of Dimes, the South Carolina Perinatal Association, and the South Carolina Improved Pregnancy Outcome Project, has prepared public service announcements that are aired on radio stations serving the Pee Dee II area. These announcements provide information about perinatal health and related issues and also provide a resource (BABY, P.O. Box 1115, Bennettsville, S.C. 29512) where interested persons can obtain more information about perinatal health and perintal health care.

Inservice education and training, a separate component within the community education effort, has been directed at the staffs of community groups and service agencies in the area, as well as at public health providers who may need to update their knowledge and skills.

Summary of Pee Dee II Public Health District—Nutrition Care Plan

Client's name _____ Gestation week at first visit _____
Address _____ Age _____
_____ Height _____ Frame _____
_____ Weight at first visit _____
Telephone No. _____ Usual nonpregnant weight _____
Client's No. _____ Ideal weight _____
Underweight or overweight _____

Nutrient requirement	Date Calories	Protein	Date Calories	Protein	Date Calories	Protein
Before 20th week of pregnancy						
Woman at 20th week of pregnancy						
Total						
Correction for underweight (5 percent or more)						
Under nutrition						
Stress						
Total						
Actual intake						
Deficit						

Perinatal Continuing Education Program

The staff of the Improved Child Health Project contracted with the Medical University of South Carolina to offer a perinatal continuing education program to hospitals in the Pee Dee II area. The comprehensive program provided under this contract consists of a self-instructional, self-paced curriculum that was designed by the University of Virginia specifically for physicians and nurses engaged in the bedside care of pregnant women, newborn babies, or both, in a community hospital. It has been offered to all five hospitals in the Pee Dee II Health District and also to the McLeod Regional Hospital in Florence (the referral center for the entire Pee Dee area). The ICHP staff believe that the program has great potential for upgrading perinatal care in small communities and for reducing their excessive neonatal mortality rates.

SWAT—Reproductive Health Education

A special effort to address teenage pregnancy was initiated through the Title X family planning component

of the Improved Child Health Project. In this effort, a team of health professionals—called Pee Dee II SWAT (special weapons attack team)—offers reproductive health education in the schools in all three counties. The target group is the adolescent population (13–16 years) with particular emphasis on the 9th grade student. The services provided by SWAT include a comprehensive 22-hour series of reproductive health education classes for various school and comunity groups; a public health nurse-educator in one county school system whose role involves identifying, counseling, referring, and following up teenagers who become pregnant or have other reproductive problems; training programs in reproductive health education for teachers; data collection and analysis; and other public awareness and public education activities.

Followup of Infants

One goal of the Improved Child Health Project has been to assure that every infant is followed in a system of health care. In July 1979, after a meeting with the Marlboro County Medical Society, the ICHP staff initiated a followup or tracking system for all infants born in the Marlboro General Hospital. The hospital nursery was visited weekly by a project nurse to obtain a record of births and necessary information for contacting the family. Shortly after the date set for the infant's first visit with the physician, a health department nurse contacted the physician's office to ascertain if the infant had been seen. If the infant was not brought in for this first visit, the health department nurse contacted the parents or family by telephone, a home visit, or both. Clients were encouraged to take their infant to the private physician, but if they did not plan to obtain care from the physician, the infant was scheduled into the infant clinic at the health department.

The majority (357 or 79 percent) of the 454 infants in this pilot effort in infant followup were brought in for their initial visit to the physician upon the parent's(s') or family's own volition without external prompting; another 10 percent were brought in after a health department nurse contacted the parent(s) or family. Sometimes several contacts were required before the infant was taken to the physician. By the time of followup, 4 of the 97 infants who failed to keep their first appointment with the physician either no longer lived in the area or were no longer receiving medical care from the same physician. Of the other 93 infants who had not kept the first appointment with the physician, 74 (80 percent) entered a health care system once their parent(s) or family were contacted:

Category of infants	*Number*	*Percent*
Failed to keep first appointment with physician	93	100
Kept rescheduled appointment with physician after parent(s) or family were contacted	46	50
Was brought to health department after parent(s) or family were contacted	28	30
Was brought to health department on parent(s) or family's own volition	7	8
Failed to enter any health care system	6	6
Died in neonatal period	6	6

This followup effort was time consuming but also was limited, since infants were followed only through their first scheduled visit with the physician. Preliminary analysis of the data has yielded two interesting points: (*a*) failure to keep the first appointment was not associated with any postneonatal deaths among those infants who were followed up to 1 year of age and (*b*) contrary to our expectations, low-birth-weight infants were brought in for their first appointment with the physician at a higher rate than infants of normal birth weight.

Special Strategies to Improve Care

Several strategies to improve perinatal care have been initiated through the Pee Dee II Improved Child Health Project. For example, genetic services are available to clients in the Pee Dee II area under a contract with the Greenwood Genetic Center, which provides diagnostic and consultative services. Transportation for in-need high-risk maternity and infant clients is provided through contracts with two local public agencies.

A special activity of the ICHP has been the establishment of a neonatal transport system to serve the 12-county Pee Dee area. Pee Dee II, in conjunction with the McLeod Regional Medical Center, Pee Dee Regional Emergency Medical Service (EMS), Pee Dee I Health District, and Pee Dee area March of Dimes, jointly purchased and equipped the transport unit. EMS technicians and a nurse will staff the unit, which will operate under the direction of a neonatologist.

Equipment such as cribs, highchairs, humidifiers, sterilizers, and infant car seats were purchased for the project and are available for loan to perinatal clients in need.

Progress in Improving Perinatal Care

Several changes took place in the delivery of perinatal health care in the Pee Dee II Health District at about the same time that the grant for the Improved Child Health Project was awarded. Between August 1978 and

December 1978, perinatal health care became more available and accessible to residents of the Pee Dee II area. Four new physicians began practicing in Marlboro County, including an obstetrician who established a private practice in Bennettsville and became the first obstetrician to practice in that county. A National Health Service Corps pediatrician also set up a private practice in Bennettsville at about this time.

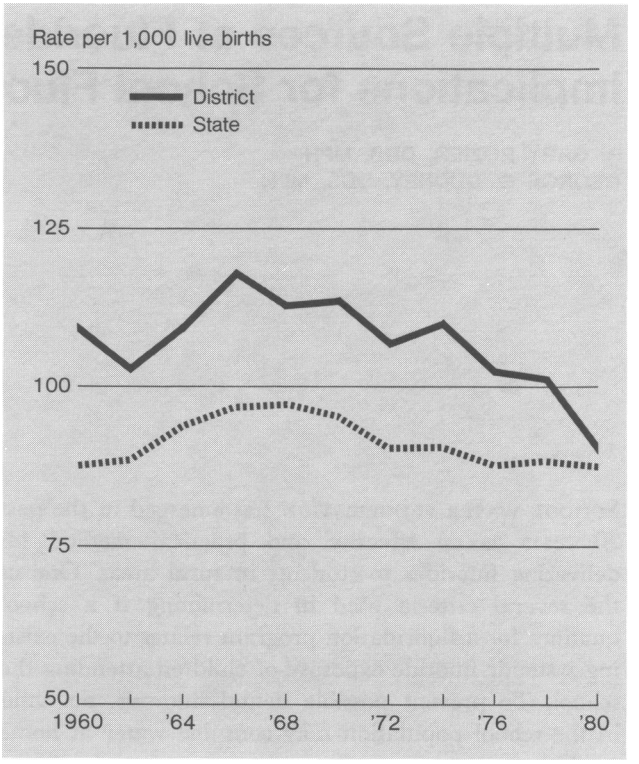
As a Rural Health Initiative project, a medical center was established in Clio, a community in Marlboro County that had been without a physician for several years. Two National Health Service Corps general practitioners were assigned to this RHI, each of whom provided perinatal health care. The expanded medical manpower in Marlboro County enabled clients with financial resources or third-party payment to obtain private obstetrical and pediatric care in the county, while the RHI made care more accessible to those with limited financial resources. The obstetrician and pediatrician in Bennettsville also serve as in-county, in-district referral sources for general practitioners and family practice physicians in the area.

The Pee Dee II medical director has played a significant role in altering the medical climate in the district by participating in local medical society activities, assisting in the establishment of three Rural Health Initiative projects, and also actively recruiting physicians for the area. As consultant to the Marlboro County Physician Search Committee, he was instrumental in bringing four physicians to the county in 1978. He also serves as consultant to the Medical Health Needs Committee of the Cheraw Chamber of Commerce and has assisted the McBee and Society Hill RHIs in the recruitment of physicians.

A review of perinatal data for the Pee Dee II Health District reveals several changes that have taken place in the years 1977–79. The most remarkable change has been a decrease in the number of low-birth-weight (less than 2,500 gm) infants in the district (fig. 2).

In 1977, infants weighing less than 2,500 gm accounted for 10.7 percent of live births in the Pee Dee II Health District. By 1979, the percentage of low-birth-weight infants had declined to 8.9. Not only did the total number of low-birth-weight infants decrease, there was also a decrease in the number of infants born weighing 1,000 gm or less, a figure that generally represents very immature infants. Since the survival rate for infants in this extremely low birth-weight group has been poor (22 percent), the large number of births in this weight group has skewed the Pee Dee II Health District's neonatal mortality rates. The decline in the number of low-birth-weight infants also has been accompanied by a decrease in the number of deaths of infants weighing less than 2,500 gm.

Figure 2. Premature birth rates for the Pee Dee II Health District of South Carolina, 1960–79



NOTE: Premature means infants weighing less than 2,500 grams at birth.

As seen in figure 1, the infant mortality rate in the Pee Dee II area has decreased from 21.6 per 1,000 live births in 1977 to 19.2 per 1,000 live births in 1979. As mentioned earlier, the ultimate goal of the Improved Child Health Project is for the area's infant mortality rate to reach the 1977 State rate of 17.6 per 1,000 live births.

These changes in perinatal statistics in the Pee Dee II area reflect some positive strides that are being taken in improving perinatal health, although the numbers are small and must be viewed as preliminary. The changes cannot be attributed solely to the Improved Child Health Project, but nevertheless the ICHP staff believe that it has served as a catalyst in mobilizing and targeting the area's energies and resources, in increasing the availability and accessibility of perinatal health care, and in promoting more efficient use of both public and private resources for improving the health of mothers and children.

Reference

1. U.S. Bureau of the Census: 1970 census of the population general population characteristics: South Carolina. Series PC (1)—B42. U.S. Government Printing Office, Washington, D.C., 1970.