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COMPREHENSIVE COMMUNITY-BASED PERINATAL CASE MANAGEMENT:
A PANACEA FOR IMPROVED OUTCOMES

By

Donna Ellyn Clark Scheideberg

A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Family and Child Ecology

1995

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ABSTRACT

COMPREHENSIVE COMMUNITY-BASED PERINATAL CASE MANAGEMENT: A PANACEA FOR IMPROVED OUTCOMES

By

Donna Ellyn Clark Scheideberg

This dissertation examined the effect of comprehensive, community-based, perinatal case management on perinatal outcomes and family stability. The study was conducted to test the hypotheses that comprehensive, community-based, perinatal case management improves perinatal outcomes of birth weight, APGAR scores, and gestational age at delivery, and that it has a positive effect on family stability factors for the psychosocially at-risk perinatal client. Survey data were gathered for the case managed women who were matched by age, fecundancy, and marital status to women who had received either comprehensive perinatal care or standard obstetrical care in a tri-county area of northern New York state and delivered between October 1991 and May 1993.

Women who received either comprehensive care or case management perinatal care had perinatal outcomes that were similar to women who received standard obstetrical care. Low birth weight and macrosomia indicators were found to be well below national averages and well below those of the

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There was found to be no support for the second hypotheses. Strong evidence indicated, however, that domestic violence, child abuse/neglect, and decreased education and employment opportunities contribute to the continuing high-risk status of the case managed client. Pregnancy recidivism was also found higher in case managed clients.

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DONNA ELLYN CLARK SCHEIDEBERG

1995

DEDICATION

To Paul for his nurturing,
love, and support

To Ashley and Ian for their kisses
and hugs when things got tough

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ACKNOWLEDGEMENTS

The completion of this dissertation could not take place without acknowledging the many people that assisted in its birth. The gestational period was long and the dissertation arrived post-mature but healthy with the support of the wonderful people of Watertown, New York. Linda Knight ARNP, Dr. Paul Kruger, Nancy Marsalis, and Joanne Dwyer, all of the Maternal Health Center, provided continuous input, support, and listened to my many woes and worries. The competent, compassionate, caring that they provided to their clients showed over and over as I gathered data from patient records.

I would also like to thank the staffs of the House of the Good Samaritan (especially the obstetrical nursing staff and the medical records staff) and OB-GYN Associates of Northern New York in helping me access patient records and directing my questions to the appropriate source. The College of Nursing at the University of Kentucky, especially Dean Carolyn Williams, Dr. Margaret Grier, Dr. Gwendolen Lee, Renate Sward, and Sally Rogers, I thank for their guidance and encouragement over the past twelve months. I need to thank especially the time commitment the College of

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Nursing provided for the completion of this dissertation.

I would like to thank all my dissertation committee members for their guidance and perseverance over the years of struggle to complete this study. Initially I would like to thank Dr. Lillian Phenice, Chairperson, Dr. Verna Hildebrand, and Dr. Linda Nelson of the Department of Family and Child Ecology, and Dr. Barbara Given of the College of Nursing. Due to retirement and other time commitments, my committee changed towards the end of the long road. I would like to thank Dr. Robert Griffore of the Department of Family and Child Ecology and Dr. Herbert Whittier of the Department of Family Practice and Anthropology for graciously accepting the challenge of assisting me in the final stages. A special thanks to Drs. John and Verna Hildebrand who befriended my family in Okinawa, Japan and helped to pave the way to Michigan State University.

A healthy conception and birth cannot occur alone. My partner in this dissertation was my spouse, Paul Scheideberg, without whom this dissertation would not have been completed. His continual support--both emotionally and financially (in large amounts of both) provided the impetus to continue through the trials and tribulations of dissertation research. I thank him for the hours of nagging, the dollars expended, the love bestowed, and the many years of dishes and vacuuming that he willingly gave.

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I also thank my children and apologize to them for the time commitment that this dissertation required. Their hugs and kisses helped to make this possible. Finally I would like to thank my parents, although deceased, for teaching me to challenge myself and to continually strive for a higher goal.

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CHAPTER 1

INTRODUCTION

Improved perinatal outcome is, and has been, a goal for health care providers in the United States for decades. In 1960 the United States ranked twenty-sixth in world standings for infant mortality and morbidity (World Bank, 1980). Thirty years later despite medical and technological advances, the United States still only ranks twenty-second in infant mortality (Copeland, 1992).

The purpose of this dissertation is to determine how comprehensive, community-based, perinatal case management affects the perinatal and family outcomes of psychosocially at-risk clients. Poor perinatal outcomes (low birth weight, prematurity, birth defects, and infant mortality and morbidity) are a result of a myriad of factors--poor access to health care, poor nutritional status, low socioeconomic status, lack of adequate housing, noncompliance to medical care, adolescence, and multiparity. Various disciplines have sought programs and developed services hoping to decrease poor outcomes:

- Nursing developed school based health care clinics and family life education.

- Medicine brought expanded hours and easier access to care.
- Social work developed school based infant day care centers.
- The federal Health Care Finance Agency developed expanded Medicaid and insurance coverage for pregnant women and young children.
- Home economists in cooperative extension developed parenting and nurturing programs for adolescent expectant mothers.
- Multidisciplinary teams developed comprehensive care programs for pregnant women utilizing nutritionists, social workers, nurse-midwives, public health nurses, and perinatologists.

All these initiatives have had limited successes. Reasons for this may include competition for scarce resources, limited impact areas, or provision of only secondary interventions.

The statistics surrounding perinatal outcome are staggering:

- Twenty percent of all newborns are born with health problems; 10% with serious medical problems (Lincoln & Johnson, 1987).
- The number of premature births has risen steadily since 1981. In 1989, premature births accounted for 10.6% of the total births (Steven & O'Connell, 1992).

- In 1988, 1 in 14 babies born in the United States were of low birth weight (Fink, Yano, & Goya, 1992).
- Two-thirds of all neonatal deaths are due to low birth weight (Watkins, 1988).
- Infants born to teenaged mothers are three times more likely to die in their first 28 days of life (Ringdahl, 1992).
- The Black infant mortality rate in 1992 was 17.6/1000 as compared to the overall infant mortality rate of 8.9/1000 (Wegman, 1993).

In 1985 the Consolidated Omnibus Reconciliation Act (PL. 99-272) was enacted. This law assisted the further development of one-stop shopping services (multiple services located at one site that cover a variety of health and human services) and opened the door for multidisciplinary case management services for perinatal clients. The central theme of case management is the interaction between the client and the case manager/case management organization to (1) assess the client's lines of defense/resistance to stressors, (2) to assess the degree of reaction and reconstitution to develop mutually agreed upon and accepted goals and (3) to provide through service and/or referral intervention modalities to restore or maintain homeostasis of the family ecosystem. Although the central theme is identified, the conceptualization of case management varies:

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1. A process of ensuring that the services provided are appropriate for the client's needs (Ryndes, 1989).
2. Planning and defining services that are coordinated among all service providers with effective client involvement and input (Cervera & Videka-Sherman, 1989).
3. A mechanism for coordinating community-based services (Sevick, 1989).
4. The responsibility for the oversight of the woman's care (Curry, 1987).
5. A system of patient care delivery that focuses on the achievement of outcomes within effective and appropriate time frames and resources (Swansburg, 1990).
6. Identification and "linkage" of patient to needed services, monitoring patient needs, and participation and when necessary, advocacy on behalf of the patient with service providers (Wissow, Worshow, Box & Baker, 1988).
7. A set of logical steps and a process of interactions with service networks that assure a patient receives needed services in a supportive, efficient, and cost-effective manner (McKenzie, Trokelson, & Hall, 1989).

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8. A health care delivery process whose goals are to provide quality health care, decrease fragmentation, enhance the quality of life and contain costs (ANA Publication #NS 32).
9. A systematic process of assessment, planning, service coordination and/or referral, and monitoring through which the multiple-service needs of clients are met (Pittman, 1989).

With the mandate under the 1985 Consolidated Omnibus Reconciliation Act, the charge for one-stop shopping (the consolidation of health care, Medicaid coverage, WIC participation, and a variety of human services at one site) for prenatal care services based on the National Commission to Prevent Infant Mortality's 1988 report *Death before life: The tragedy of infant mortality* (Building on the Basics, 1990), and Health Care Reform, it is clear that the comprehensive multidisciplinary approach will be the model for prenatal care programs developed in the United States for the remainder of this decade; however the effectiveness of this strategy for reducing risks and thus improving pregnancy outcomes and, in turn, family stability, has not been fully documented.

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Information obtained from this study will allow health and human service care providers an expanded format to assist with meeting the needs of the community, meeting the goals of decreasing infant mortality, strengthening family bonds, and reducing wastage of dollars spent in duplication of services.

CHAPTER 2

REVIEW OF THE LITERATURE

In 1979 Healthy People, a report from the Surgeon General, established a goal to reduce infant mortality to fewer than 9 deaths per 1000 births (Platt, 1989). In 1978 the infant mortality rate was 13.8/1000. Thirteen years later, in 1991, that goal was met with the rate at 8.9/1000, however the United States ranked 24th in worldwide infant mortality standings, a decline from 20th in 1980 (Infant Mortality, 1993; Wegman, 1993). Despite technological and medical advances in maternal-fetal care, poor perinatal outcomes with resultant neonatal and child morbidity and mortality continues to perplex scientists and health care providers.

Factors that Influence Perinatal Outcomes

There has been a myriad of studies conducted on factors that may affect perinatal outcomes. Increasing access to prenatal care was considered the number one factor in reducing infant mortality and morbidity over the past two decades. Therefore, the majority of research centers on barriers to care. The Institute of Medicine (IOM)

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identified the major barriers as (Curry, 1987):

1. Limited availability of providers of prenatal care.
2. Insufficient prenatal care services in sites serving high-risk populations.
3. Experiences, attitudes, and beliefs among women that disincline them to seek or maintain prenatal care.
4. Lack of transportation and shortage of child care services.
5. Inadequate systems to recruit hard to reach women into care.

Interventions successful in improving pregnancy outcomes, although limited in scope and application, include:

1. Initial and ongoing risk assessments.
2. Adequate prenatal care.
3. Nutritional counseling
4. Health education
5. Social support services.

Each of these interventions is reviewed in relation to identified barriers and perinatal and family outcomes.

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Risk Assessments

There are various tools to determine risk status of pregnant women. The Institute of Medicine in 1985 found no consensus on a risk assessment tool that was both a reliable and sensitive method for pregnant women in various populations (Mawn & Bradley, 1993). Although each tool varies in scope and complexity most address three major areas: socio-demographic characteristics, lifestyle factors, and medical/health status.

There is consensus on medical/health status risks and pregnancy outcomes. Women with chronic conditions of diabetes, hypertension, and cardiac or renal diseases are at risk for less than optimal pregnancy outcomes. There is also some consensus, although not unanimous, on other medical conditions: chronic and acute anemia, thyroid diseases, and collagen diseases. Obstetrical problems of grand multiparity (greater than five pregnancies), abdominal surgery during pregnancy, bleeding during pregnancy, uterine anomalies, pyelonephritis, and previous delivery of a low birth weight infant (weight under 2500 grams) are considered high risk factors for poor perinatal outcomes. Health care providers are well equipped to treat these medical and obstetrical conditions and thus decrease the risks.

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Socio-demographic risk factors for pregnant women include age less than 18 or greater than 35, single status, poor economic status, minority race or ethnic group, less than a high school education, and communication barriers. In 1989 the number of low birth weight infants was 7.0/1000--the highest rate the United States has seen since 1978. If a woman was a teenager that rate was higher (13.4). The same was true if she was 40 years of age or older (10.5) (Stevens & O'Connell, 1992).

In 1988, 66% of births to teenagers were to single mothers (LeHew, 1992) compared to only 15% in 1950 (Davis, R., 1989). In 1989 births to teens increased to its highest level in 15 years. Births to teens aged 15-17 was 36.5/1000 while those to teens aged 18-19 was 86/1000 (Stevens & O'Connell, 1992). Infants born to mothers aged 17 or younger are three times more likely to die in their first twenty-eight days of life (Ringdahl, 1992). Post-neonatal mortality rates are approximately twice as high for infants of teens than for older women (McAnarney & Hendee, 1989a). Teenaged pregnancies result not only in poor infant outcomes, but are linked to high unemployment, poverty, and lack of educational attainment for the parents. The child born to teenaged parents is also at risk for lower intellectual and academic achievement, social and behavioral problems and becoming teen parents themselves (LeHew, 1992).

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Births to unmarried women hit a new high in 1990 with 1,165,384 babies born to single mothers. This breaks down to 20% of all White births, 37% of all Hispanic births, and 67% of all Black births for an overall 28% single parent birth rate compared to a 3.9% rate in 1950 (Beck, 1993).

Poverty "by itself does not contribute to poor outcomes but is associated with...cultural, institutional, financial and personal barriers to care that do convey high risk" (Culpepper & Jack, 1993). In 1985, 75% of families maintained by a woman under 25 years of age were living in poverty (McAnarney & Hendee, 1989a). Fifty percent of all women receiving government assistance had their first child when they were teens (Ringdahl, 1992). Infant mortality rates among low income children are twice that for non-low income children (Rosenbaum, Hughes, Butler, & Howard, 1988). Haas, Udvarhelyi, Morris, and Epstein (1993) found no change in the incidence of poor birth outcomes in their study of health coverage for poor uninsured pregnant women in Massachusetts from 1984-1987. Piper, Ray, and Griffin (1990) investigated financial coverage and adverse birth outcomes in their 1984-1987 study in Tennessee on Medicaid changes. They also found no improvement in birth outcomes.

The maternal mortality rates for Black and non-White women are four times higher than for White women (Rosenbaum et al., 1988). Infant mortality rates are also higher for non-White infants born in the United States. One-fourth of

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Schoendorf, Hogue, Kleinman, and Rowley (1992) studied the infant mortality rates of college educated parents in 1983-1985. They found that infants of Black college educated parents were twice as likely as infants of White college educated parents to have low birth weight and the risk of very low birth weight (1500 grams or less) was three times higher.

More than one million pregnancies occur to teens annually. These teen mothers are less likely to finish high school which contributes to their inability to achieve economic independence. Parenthood before age 18 reduces high school completion rates by 50% for women and 25% for men (Ambler & Dull, 1987). Studies have shown however, that living with their children (for Whites) and marrying the mother (for Blacks) increases the odds that teen males will finish high school (Davis, S., 1989).

The major life style factors that are associated with premature birth, intrauterine growth retardation, and infant mortality are substance use/abuse, poor nutrition, and short interpregnancy interval (less than twelve months between pregnancies). The relationship of smoking to low birth weight was established in 1957 by Simpson (Floyd, Rimer,

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Giovino, Mullen, & Sullivan, 1993). Smoking continues to be a major contributor to poor perinatal outcomes. Among the 3.9 million women delivering annually 25% smoke (Huddleston, 1992; Windsor, Li, Lowe, Perkins, Erschoof, & Glynn, 1993). Approximately 5% of all prenatal deaths and 14% of all low birth weight deliveries in the US can be attributed to smoking (Culpepper & Jack, 1993). Smoking accounts for 20-30% of the low birth weight rate and 10% of the infant mortality rates in the U.S. (Windsor et al., 1993). Smoking reduces birth weight by an average of 150-250 grams and doubles the risk of low birth weight (Willis & Fullerton, 1991). Land and Stockbauer (1993) analyzed smoking among pregnant Black teens in Missouri from 1978-1990. They found that the overall Black teen smoking rate decreased 28.6% while the Black pregnant teen smoking rate decreased 15%. They also found that the incidence of low birth weight infants among Black teens decreased 13.6% over the same period. McDonald, Armstrong, and Sloan (1992) in their study of Montreal single new parents found smoking accounted for 39% of low birth weight for gestational age, 35% of low birth weight infants, and 11% of premature births.

Alcohol consumption and its effects on embryonic development are well known. Current findings on alcohol consumption and low birth weight are somewhat startling. McDonald et al. (1992) found in their Montreal study of just completed pregnancies that light consumption of alcohol had

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Consumption of cocaine contributes to a high incidence of premature labor and birth and thus low birth weight infants. Infants of cocaine users were three times more likely to have low birth weight (Willis & Fullerton, 1991). A retrospective population-based study in New York City 1988-1990 (Racine, Joyce, & Anderson, 1993) found that receipt of prenatal care among cocaine users was associated with significant improvements in birth weight.

Women who have short interpregnancy intervals are at high risk for delivery of a low birth weight infant. A multicenter study of 55,000 women from 1959-1966 found that short interpregnancy intervals occurred in women who were young, had less education, and were light weight (Klebanoff, 1988). Other researchers found that teens were likely to have a second pregnancy within two years of their first delivery (O'Sullivan & Jacobsen, 1992).

Prenatal care

"Prenatal care is defined as services provided to all patients (mother, fetus, newborn) (1) from the time of conception to the onset of labor, (2) during labor and delivery, and (3) for an extended period after delivery" (Development, 1992, p. 4).

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The components of prenatal care include early and continuing risk assessments, health promotion, and medical and psychological interventions with follow-up. The objectives for prenatal care based on the *Report of the public health service expert panel on the content of prenatal care, October 1988* are (Culpepper & Jack, 1993):

1. For the pregnant woman:
 - a. To increase well-being before, during, and after pregnancy and to improve self-image and self-care.
 - b. To reduce maternal morality and morbidity, fetal loss, and unnecessary pregnancy interventions.
 - c. To reduce the risk to her health prior to subsequent pregnancies and beyond childbearing years.
 - d. To promote the development of parental skills.
2. For the fetus and infant:
 - a. To increase well-being.
 - b. To reduce premature birth, intrauterine growth retardation, congenital anomalies, and failure to thrive.
 - c. To promote healthy growth and development, immunizations, and health supervision.
 - d. To reduce neurological, developmental, and other morbidity.

- e. To reduce child abuse and neglect, injuries, preventable acute and chronic illness, and the need for extended hospitalization after birth.
3. For the family during pregnancy and the infant's first year of life:
- a. To promote family development and positive parent-infant interaction.
 - b. To reduce unintended pregnancies.
 - c. To identify for treatment behavior disorders leading to child neglect and family violence.

Prenatal care utilization is influenced by financial resources, system capacity, and cultural and personal attitudes and beliefs. A 1983 study (Hutchins, 1985) for the National Governor's Association found that women living in poverty in the United States were three times more likely to receive no prenatal care than women living in non-poverty areas. The perception of cost barriers was the most important variable in determining adequacy of prenatal care received by teenagers in a study by Cartwright, McLaughlin, Martinez, Caul, Hogan, Reed, & Swafford (1993). Harvey and Fober (1993) in their study of rural Oregon women 1988-1990 found that despite the establishment of a program to provide prenatal care to low income women who could not afford it, the most common reasons cited for inadequate prenatal care were financial obstacles (70% had difficulty in paying for

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prenatal care and 55% had difficulty with medical insurance coverage).

In the early 1980s states were able to appropriate new state dollars to pay for prenatal services for women up to 185% of poverty who were previously ineligible for Medicaid. Goldfarb, Hillman, Eisenberg, Kelly, Cohen, and Dellheim (1991) studied the impact of a financial-based (cost-containment) Medicaid program called *HealthPASS* had on the adequacy of prenatal care and birth outcomes among enrollees. They found no significant differences between *HealthPASS* and Medicaid enrollees on either services or outcomes. The GAO (U.S. Government Accounting Office) report of 1987 on Medicaid recipients and uninsured women (Platt, 1989) found that 63% of the women interviewed cited lack of money to pay for prenatal care as the primary reason for inadequate prenatal care. Family income, travel time, plannedness of the pregnancy, and type of financial coverage were significant predictors of when prenatal care was initiated in McDonald and Coburn's (1988) study of Maine women in 1983.

Available data suggest that prenatal care is cost-effective. For every dollar spent on prenatal care, \$2-\$3.33 is saved in neonatal intensive care for low birth weight infants alone. The indirect cost of preventable low birth weight and infant mortality has been estimated between 6-12 billion dollars annually in lost productivity (Platt,

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1989; Fink et al., 1992; Children's Defense Fund, 1991).

Thirty-four percent of pregnant women (approximately 1.3 million annually) receive inadequate prenatal care. Inadequate care is defined as care started after the first trimester, only one prenatal visit between gestational weeks 22-29, or less than 4 total visits (Lincoln & Johnson, 1987). Based on the 1987 GAO report, 81% of privately insured women began prenatal care in the first trimester and made nine or more prenatal visits compared with 36% of women with Medicaid coverage and 32% of women with no health insurance (Platt, 1989). In 1985, the National Center for Health Statistics reported that only 45% of teenagers enter prenatal care during the first trimester and 5% receive no prenatal care at all (Cartwright et al., 1993). Women who do not obtain adequate prenatal care double the risk of having a low birth weight infant. These women are also at risk for inadequate weight gain and delivering an infant prematurely (Lincoln & Johnson, 1987). Showstack, Burdetti, and Minkler (1984) used multiple regression to analyze birth outcomes and prenatal care. They found an increase of approximately 200 grams in infant birth weight when adequate prenatal care was received.

Inadequate prenatal care is not only linked to financial resources but to availability of health care providers. In the early 1980s, 44% of US physicians providing obstetrical services did not accept Medicaid

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patients (Harvey & Fober, 1993). Expanded Medicaid and increased payments to health care providers has brought the participating physician rate to approximately 60% (Copeland, 1992). Unfortunately this still leaves a large portion of pregnant women without physician providers who will accept Medicaid. Pregnant women must travel quite long distances in many areas of the U.S. to receive prenatal care. In 1987, 799 counties throughout the U.S. had documented 200,000 births where no prenatal care was available (Copeland, 1992). Transportation difficulties have been cited as a major barrier to obtaining adequate prenatal care in several research studies (Harvey & Fober, 1993; Kugler, Yeash, & Rumbaugh, 1993; Cartwright et al., 1993). Arizona, the first state to enroll all Medicaid clients in a managed care program, provides primary health care, no copayment for prenatal care, and reimbursement for transportation to a health care provider. This program, however, was not effective in ensuring adequate prenatal care usage. The researchers found that transportation problems (limited access to bus services), other children in the family, lack of social support, and lack of knowledge of Medicaid coverage were the major barriers cited by the recipients (Moore and Hepworth, 1994).

Cultural or personal factors that are significant predictors of obtaining adequate care include (Harvey & Fober, 1993):

1. Poor understanding or low value of the importance of prenatal care.
2. Ambivalence about the pregnancy.
3. Stress

Cartwright et al. (1993) study of teenagers' perceptions of barriers to prenatal care found that the degree of support after cost barriers was the most important barrier. Kugler et al. (1993) found a negative correlation between optimal prenatal care utilization and dysfunctional family scores in their research of 368 military pregnancy families in 1989. Poland, Giblin, Waller, and Bayer (1991) found that 14.4% of their study population of low income mothers in Detroit cited prenatal care as unimportant (lack of knowledge of importance of prenatal care) as a reason for missing prenatal care appointments.

Nutrition

Nutrition and its role in birth outcomes have been studied thoroughly over the past few decades. Research was instrumental in the initiation of the federal nutrition program, Women, Infants, and Children (WIC), for pregnant and lactating women and their children through age five. Research findings were also instrumental in initiating SNAP,

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Supplemental Nutrition Assistance Program, which allows more pregnant women to enroll in state funded forms of WIC. Buescher, Larson, Nelson, and Lenihan (1993) studied the impact of prenatal WIC on low birth weight and Medicaid costs for newborn care for 1988. Their findings were significant. White participants had 22% lower low birth weight and 44% lower very low birth weight infants while Black participants had 31% lower low birth weight and 57% lower very low birth weight infants than non-WIC participants. The cost-benefit analysis showed that for every dollar spent on WIC services, Medicaid savings in newborn medical care were \$2.91.

Parker and Abrams (1992) replicated an earlier study by Scholl on weight gain and birth outcomes. They found, like earlier researchers, that low prenatal weight gain was associated with low birth weight. Springer, Bischooping, Sampsel, Mayes, and Petersen (1992) studied weight gain with outcomes of birth weight and gestational age. They found that women who were underweight reduced the infant's gestational age at birth by 1.82 weeks.

Health education

Health education plays an important part in promoting optimal birth outcomes. Health education in pregnancy includes nutritional counseling, smoking cessation awareness, avoidance of alcohol and illicit drugs, and

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Table 1
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exercise. McCurdy's (1992) Colorado health project targeted 988 women to determine the effects behavioral changes had on low birth weight. The researchers found that women who resolved their behavioral risks had fewer low birth weight infants than those who did not (3.7% versus 11.1%). They also found that decreasing only one or two behavioral risks had positive effects (see Table 1). Other researchers found that smoking cessation in the first half of pregnancy will provide the same low birth weight risk as a non-smokers (Floyd et al., 1993). McDonald et al. (1992) found that women with increased alcohol intake have low birth weight infants. They also found in their study population that smoking accounted for 35% of low birth weight infants and 11% of premature infants.

Table 1.
Behavioral Risks and Risk of Delivering Low Birth Weight Infants [Adapted from findings of McCurdy. (1992). Colorado Medicine, p. 262].

Risk Behavior	% of Risk Behavior Change	% of Risk No Change
Underweight & Smoking	0.0	12.8
Smoking	6.8	10.0
Alcohol	5.8	10.2

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Social support

Social support is the network of resource, tangible and psychological, that assists persons or families to cope with life events. Tangible support is the specific behavior or resource that is provided or shared. Psychological support is provided through emotional and informational assistance (Knox & Snowden, 1989). Pregnancy is a life cycle event that is also influenced by concurrent stressors: concerns with medical care, family relationships, neighborhood crime, financial insecurity, and/or isolation. The woman must appraise the stressors, identify coping mechanism, and react to the situation.

"Coping mechanism and sources of social support are important to stress assessment in that they provide a basis for understanding each individual's potential for psychological adjustment throughout the pregnancy" (Knox & Snowden, 1989, p. 181).

Pregnancy may exert negative effects.

"It may divert a woman or couple's attention from the pregnancy and decrease the priority of pregnancy-related events...Stress may create unhealthy coping behaviors including smoking, substance use, inadequate rest, and excessive work. It may alter interpersonal relations and decrease the resources available to the woman" (Culpepper & Jack, 1993, p. 606).

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McAnarney and Stevens-Simon (1990) found that psychologically stressed women gained less weight and had infants of lower birth weights. Bryce, Stanley, and Garner (1991) also found that stress in pregnancy was associated with premature births and low birth weight infants. Williamson and LeFevre (1992) studied the relationship of tangible support and perinatal outcomes in Missouri from 1984-1986. They found that women with low tangible support (no or only one reliable support person) had a higher rate of neonatal death, neonatal intensive care unit stays, low birth weight, and low APGAR scores (a scoring system that evaluates the physical condition of the newborn at birth and the immediate need for resuscitation) (Olds, London, & Ladewig, 1992) than those women with moderate or high tangible supports (two or more people). Zuckerman, Amaro, Bauchner, and Cabral (1989) studied 1014 women between 1984-1987 to determine the relationships of depressive symptoms in pregnancy and maternal health status and behaviors. They found that depressive symptoms were significantly associated with poor maternal health behaviors of poor weight gain, smoking, and alcohol and cocaine use.

Rofe and Goldberg in 1983 (Istvan, 1986) studied the relation of blood pressure to stressful environments just prior to childbirth in Israel. They found consistent increases in blood pressure with increasing level of stress exposure (as determined by the level of terrorist activity).

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They found 20% of women in low stress areas had diastolic blood pressures above 85 mmHg as compared to 49% from high stress areas.

A stressful environment can also be the home environment itself. Based on findings from the second National Family Violence Survey (Newberger, Barkan, Lieberman, McCormick, Yllo, Gary, & Schnechter, 1992) 154 acts of violence per 1000 women occurred during the first four months of pregnancy and 170 acts of violence per 1000 women occurred during the fifth through ninth months of pregnancy. Bullock and McFarlane (1989) studied the effects of battering in pregnancy on birth outcomes. In their study of 589 women, the percentage of battered women who gave birth to low birth weight infants was twice that of the non-battered woman (12.5% versus 6.6%).

Summary of Factors that Influence Perinatal Outcomes:

Research has identified components that are successful in improving perinatal outcomes:

1. Initial and ongoing risk assessment and adequate prenatal care.

Barriers of excessive stress, ambivalence about the pregnancy, and poor understanding of or low value of prenatal care are significant predictors of obtaining inadequate prenatal care. Every dollar spent on prenatal

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care saves \$3.38 in care of the low birth weight infant (Harvey & Fober, 1993).

2. Nutritional counseling

There is a positive relationship between adequate early weight gain, decreased substance use/abuse behavior, and gestational age/birth weight (Springer et al., 1992). WIC participation decreases the number of low birth weight and very low birth weight infants born annually (Buescher et al., 1993).

3. Education to reduce or eliminate unhealthful habits

Smoking and alcohol use is associated with low birth weight and premature infants (McDonald et al., 1992).

4. Social support services

Low birth weight infants are more likely to be associated with women who are battered. There are conflicting findings on the relationship of early prenatal care, birth weight, and neonatal mortality with social support programs (McDonald & Coburn, 1988; Piper, Ray, & Griffen, 1990; Goldfarb et al., 1991).

Prenatal Care Programs

Research findings document the complexities of our ecosystems: optimal perinatal outcome is greater than the sum of the factors. Programs that address perinatal outcomes, and thus family outcomes, must address the whole ecosystem of the pregnant woman and her family to provide

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success. The National Commission to Prevent Infant Mortality in 1988 reported (Sharp, 1993, p. 18):

"Unless every pregnant woman and infant in the United States has access to early, good, quality, comprehensive prenatal and pediatric care, no progress will be made in the area of infant mortality."

Programs developed that address perinatal outcomes and the pregnant woman and her family are reviewed briefly.

Comprehensive Prenatal Care Programs

Comprehensive prenatal services include prenatal care and psycho-social supports. Comprehensive care has the "potential to ensure that the diverse elements of care are provided through an integrated package of coordinated services" (Jessop & Stein, 1994). Ideally this integrated package should be located in one setting.

"One-stop shopping describes a client-centered system that enhances access to care by improving integration and coordination among programs, ensuring comprehensive delivery of services and simplifying enrollment procedures and eligibility criteria for health and social services and financial assistance" (Macro Systems, 1990, p. 1).

There are several one-stop shopping programs in the United States that provide comprehensive prenatal services:

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Pregnancy Aid of Snohomish County, Everett, Washington:

Provides emergency supplies of baby food and formula, emergency housing, prenatal vitamins, public information programs for schools and community groups, problem-solving assistance for clients facing red-tape difficulties. (Healthy mothers and healthy babies, 1986).

Birthright Pregnancy Care Center, Hastings, Nebraska:

Work with clients on a one to one basis addressing problems of abuse, housing, education, clothing, transportation and legal aid (Healthy mothers and healthy babies, 1986).

Healthy Start, nationwide programs: Mobilizes communities to pull together health, housing, nutrition, social, job training, and economic development services to assist low income pregnant women (Sharp, 1993).

Jackson-Hinds Community Health Center, Jackson,

Mississippi: Provides basic medical care (prenatal, post-partum, family planning, and child health), laboratory services, pharmacy, nutrition education, WIC, social services, homeless shelter, home visitation program, and high-risk infant tracking (Macro Systems, 1990).

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Duval County Public Health Unit, Jacksonville, Florida: Provides prenatal care, post-partum care, family planning, WIC, and presumptive Medicaid eligibility (Macro Systems, 1990).

Childbearing Women's Project, Barre, Vermont: Provides prenatal care, WIC, home visits, delivery service, and assistance with Medicaid forms (Macro Systems, 1990).

Comprehensive care programs differ greatly in scope and breadth from one agency or locale to another. Prenatal care programs that provide home visitation for social support and home assessment are one type of comprehensive care service. Blondell and Breart's 1992 meta-analysis of three randomized controlled trials of 1410 women who had prenatal complications found no statistical significance in home visitations on antepartal hospitalizations. However, Helewa, Heamon, Robinson, and Thompson (1993) contribute an annual savings of \$148,000 to home visiting in mild pre-eclampsia management in their 1985-1989 study of 321 women in Winnipeg, Canada.

The National Commission to Prevent Infant Mortality has included home visitation as a strategy to improve perinatal outcomes (Olds, 1992). Bryce et al. (1991) found no significant difference on the effectiveness of home visiting with the prevention of premature births in their study of 1970 women in Western Australia. Conversely Olds' (1992)

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study of 400 women in Elmira, New York found that women who received home visitation had reduced smoking, improved nutritional intake, and had 75% fewer premature births than their comparison groups.

The 1980s saw school-based teenage clinic developing to address the special issues of adolescents: relationships, decision-making, sexual concerns, sexually transmitted diseases, contraception, and teen pregnancy. A study of school-based clinics and their effectiveness on birthrates in St. Paul, Minnesota 1971-1986 showed no difference in school-wide birthrates (Kirby, Resnick, Downes, Kocker, Gunderson & Potthoff, 1993). Setzer and Smith (1992) studied 339 teenaged mothers in Dallas finding no significant differences in gestational age, infant birth weight, or repeat pregnancy rates in school-based and non school-based programs.

Both home visitation and school-based health care programs provide some components of comprehensive prenatal care services. Other programs have developed that stress prenatal care, psychological support, and financial assistance. Sokol reports comprehensive prenatal care is associated with higher birth weights and improved perinatal outcomes (Showstack et al., 1984). Felici, Granados, Ances, Hebel, Roeder, and Heald (1981) studied a comprehensive prenatal care program for inner city teenagers. They matched the 67 teenagers aged 15 and below with a

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comprehensive group of 67 inner city teenagers who received standard obstetrical care. The teenagers in the comprehensive group were seen by a physician, nutritionist, and social worker. The study group had 9% low birth weight infants as compared to 20.9% in the control group. Rabin, Seltzer, and Pollard (1991) also studied comprehensive prenatal care programs for teenagers. Their study matched teenagers in comprehensive care to teenagers in standard adult obstetrical clinics. They found lower maternal and infant mortality, more frequent contraceptive use, increased regular school attendance, and decreased repeat pregnancy rate in the teen comprehensive care group. Horwitz, Klerman, Kuo, and Jewel (1991) looked at teenage mothers via long term follow-up of the Young Mother's Program. The Young Mother's Program was one of the first comprehensive programs for pregnant teens in the United States that provided obstetrical care, social services, and educational services. At the 20-year follow-up the women who were members of the comprehensive program reported a greater sense of control over their lives, had higher educational aspirations for themselves and their children, understood their roles as mothers, and reported little social isolation. McLaughlin, Altemeier, Christensen, Sherrod, Dietrich, and Stern (1992) studied the effects of comprehensive care and birth outcomes among low income women. The comprehensive prenatal care group received care

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from a team consisting of nurse-midwives, social workers, nutritionists, psychologists and paraprofessional home visitors while the control group received standard obstetrical care. Multiple regression analysis showed that comprehensive prenatal care was related to higher birth weights for primigravidas but not for multigravidas.

Case Management Programs

In 1988, Vince Hutchins of the U.S. Bureau of Maternal and Child Health called for a new approach to care for the vulnerable populations of pregnant women and children:

"A system that assures effective continuity of care with appropriate monitoring, referral, and specialized services..." (Hutchins, 1988, p. 2).

This system, case management, coordinates community based services through continuity of care that emphasizes an individualized approach to patient care and a commitment to the ideals of comprehensiveness, thus empowering client decision-making, enhancing psychosocial functioning, and promoting health. Case management requires multi-institutional and interdisciplinary efforts to influence economic, social, and lifestyle issues as well as access to health care to promote improved perinatal and family outcomes.

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In September 1990, the United Nations' Convention on the Rights of the Child was signed by over seventy world leaders. Within a year 105 countries had ratified this document that specifies in Article 24:

"The recognition of the child's right to the highest attainable standards of health, including appropriate prenatal and postnatal care for all mothers, taking measures to diminish infant and child mortality, and the development of preventive care, including family planning services" (Mawn & Bradley, 1993, p. 78).

Absent from the list of national and world signatures was the United States. The American Academy of Pediatrics endorsed this treaty statement and has asked President Clinton for support. President Clinton has asked the U.S. State Department to review the Convention to determine if it is consistent with state laws (Haggerty, 1994). Despite the absence of the U.S. ratification, states throughout the United States have initiated case management programs to improve perinatal outcomes.

The Teen Parent Initiative Pilot Program was a five-year case management program in Texas. Two separate programs were developed: TEAM (Training and Education for Adolescent Mothers) and Redirection. These two programs, with similar services although different formats, provided on-site comprehensive service of education, job development and training, child care, and health services of prenatal

care and family planning along with case management services of counseling, brokering, advocacy, and linkage (Teen Parent, 1987). While project TEAM was discontinued in its third year due to financial problems with the parent agency (Teen Parent, 1990), both programs had success in terms of lower low birth weight rates and lower repeat pregnancy rates (see Table 2).

Table 2.
Low Birth Weight and Pregnancy Recidivism Rates (Results abstracted from the Teen Parent Initiative Pilot Program of Texas, 1991).

Variable	National Rate	TEAM	Redirection
Low Birth Weight	12.7	8.0	6.8
Repeat Pregnancy at One Year	30.9	n/a	3.6
Repeat Pregnancy at Two Years	43.2	n/a	5.1

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Families with a Future (Illinois Department of Health, 1990) was Illinois' case management program to reduce infant mortality. This program brought to targeted areas throughout the state integrated community-based health and social services to ensure access and utilization of needed services to pregnant women and their families. The results were dramatic for the non urban areas. Infant mortality was decreased 22.4% in the non urban targeted areas. Neonatal mortality also decreased by 23.5% in the non urban targeted areas. The targeted areas in Chicago saw a smaller decline in infant and neonatal mortality that the researchers attributed to the complex and persistent social problems that face Chicagoans.

Project CONNECT in New York City is a collaborative effort to facilitate access to and expand delivery of health and human services to pregnant and parenting women through comprehensive case management and provision of priority access to needed services. Special attention is given to high-risk women presenting with late or no prenatal care, pregnant teenagers, substance/alcohol abusers, and HIV positive women (Randolph & Sherman, 1993). Since this is a relatively new program, statistical evidence of effectiveness is not available.

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Another program in its infancy is the New Mexico Families FIRST (Families and Infants Receive Services and Training) project (Mawn & Bradley, 1993). Families FIRST is a 4-year demonstration project for Medicaid eligible pregnant women and their children in four sites throughout the state. The program provides a nursing case management approach that includes education, outreach, and care coordination.

Prenatal Care Programs Summary

Comprehensive and case management programs addressing prenatal care attempt to answer the charge given to the world at the WHO/UNICEF 1978 Alma Ata conference, *Health for all by the year 2000*. Article VII of the *Declaration of Alma-Ata* states (Owen, 1987, p. 15):

"Primary health care relies at local and referral levels on health workers, including physicians, nurses, midwives, auxiliaries, community workers, as well as traditional practitioners, as needed, suitably trained socially and technically to work, as a health team and to respond to the health needs of the community."

Although multidisciplinary and interdisciplinary efforts have addressed perinatal outcomes, these programs vary greatly in their scope, breadth, and degree of interaction. Conflicting findings exist between similar and dissimilar comprehensive programs; thus, no statistical inferences can

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be determined. The effectiveness of case management program for reducing risk and improving both perinatal and family outcomes have not been fully documented perhaps due to the infancy of these programs. This dissertation will investigate the effectiveness of community-based comprehensive case management in the prenatal care setting in improving perinatal outcomes as well as strengthening the family unit.

CHAPTER 3

A REVIEW OF CONCEPTUAL FRAMEWORKS

Case management is proposed as a method for improving perinatal outcomes. The method provides not only comprehensive health care services, but also promotes primary interventions as well as secondary and tertiary interventions. The proposed comprehensive approach to case management in the perinatal setting not only impacts perinatal outcomes but focuses on the pregnant woman and her family ecosystem promoting wellness throughout the life cycle.

Both Neuman's nursing system model and family ecosystem framework utilize general systems theory to identify the concepts of wholism and non-summativity. The frameworks provide for woman with her unique characteristics and interactions as the central core of the model. Boundaries that protect and defend this core from the environments that interface and interact with each other and with the central core are identified. Together the frameworks provide a model of wellness that represents a multicausal relationship between the environments and the human environed unit (the central core). When entropy occurs, or when boundaries can

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no longer protect and defend, the synthesized framework provides the basis for a dynamic and interactive process to maintain, restore, or attain optimal wellness. This process is entitled case management. The scope and process of community-based, comprehensive, perinatal case management will be identified through the conceptual theories and their synthesis. This will enable the researcher to discuss the implications of the research findings with special emphasis to community-based primary nursing care and to provide a critical science perspective.

Family Ecosystem Framework

Although the conceptual framework of family ecosystem is relatively new (since the late 1970's), it has its roots stretching back into the last century. In 1866 Ernest Haeckle coined the term "ecology" to conceptualize the relationship of an organism with other organisms and with their environments (Grief & Lynch, 1983). In 1892 Richards proposed that:

"environment was being transformed by technology, but, people must retain some control over their lives and environment...[Ecology is] a means for applying principles, methods, and results of science for improvement of peoples lives and their environment" (Bubolz & Sontag, 1993, p. 420).

Ecology was not, however, considered a true science until 1915 when Robert Park published his ecological study of the city and its peoples in an article entitled: *The city: Suggestions for the investigation of human behavior in city environment* (Wirth, 1961). In the 1950's Hawley introduced the family in an ecological perspective. Using Tonnies' ideas of *Gemeinschaft* and *Gesellschaft* to show the relationship of the family unit to its environment. (*Gemeinschaft* is conceptualized as the individual being born into a small homogeneous and intimate group in which interrelations are personal and based upon common interests. *Gesellschaft* is conceptualized as the individual matures and moves out into a large universe of interrelations characterized by impersonality and functional specialization (Hawley, 1950, p. 208).

In 1970, Hook and Paolucci brought forth the concept of family as an ecosystem:

"The family is a life support system, dependent on the natural environment for physical sustenance and on the social environment for humanness and for giving quality and meaning to life" (Bubolz & Sontag, 1993, p. 423).

This concept borrows from general systems theory especially in regard to two aspects:

1. Cybernetic communication
2. The action of one unit affecting the rest of the system.

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Figure 1)

Family ecosystem builds upon ecological theory by concentrating on the linkages among systems and how a change in one system will produce a change in another system. In the family ecosystem, the family is placed at the core of the universe (the human enviroined unit) and the environments that interface and interact with the family encircle it. Bubolz, Eicher, and Sontag (1979) conceptualized these environments as the human behavioral environment, the human constructed environment, and the natural environment (see Figure 1).

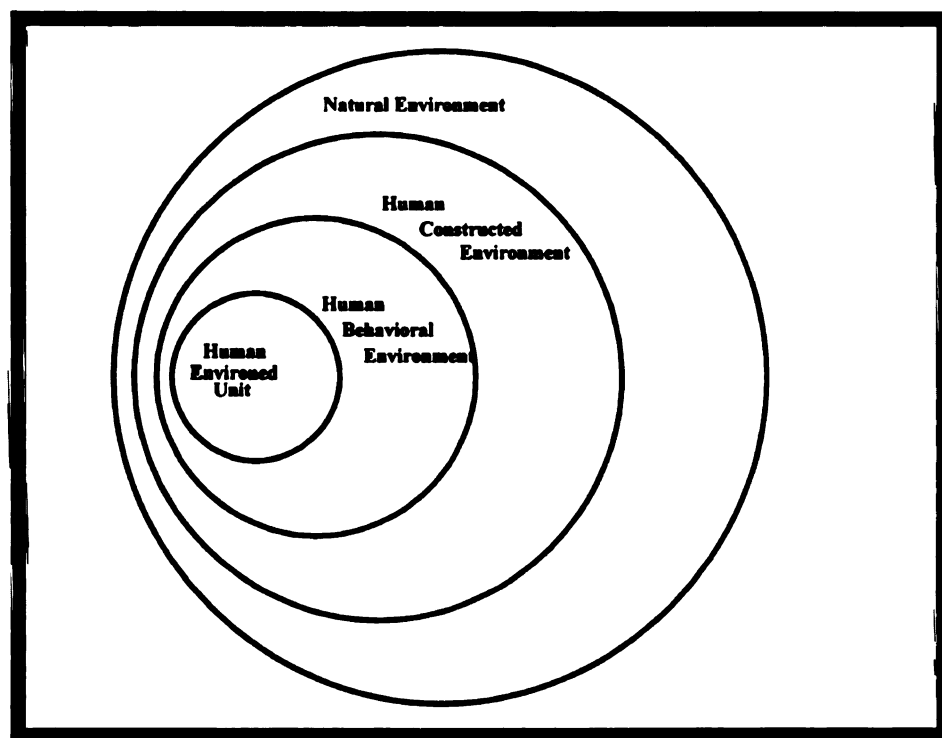


Figure 1.
The Human Ecosystem: A Model. Adapted from:
Bubolz, M, Eicher, J, and Sontag, M. (Spring
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Bronfenbrenner used a similar nesting model (see Figure 2) but identified the environments in a general systems perspective of microsystem (the family), mesosystem (relations among family and community), exosystem (community and neighborhoods), and macrosystem (cultural beliefs and institutions).

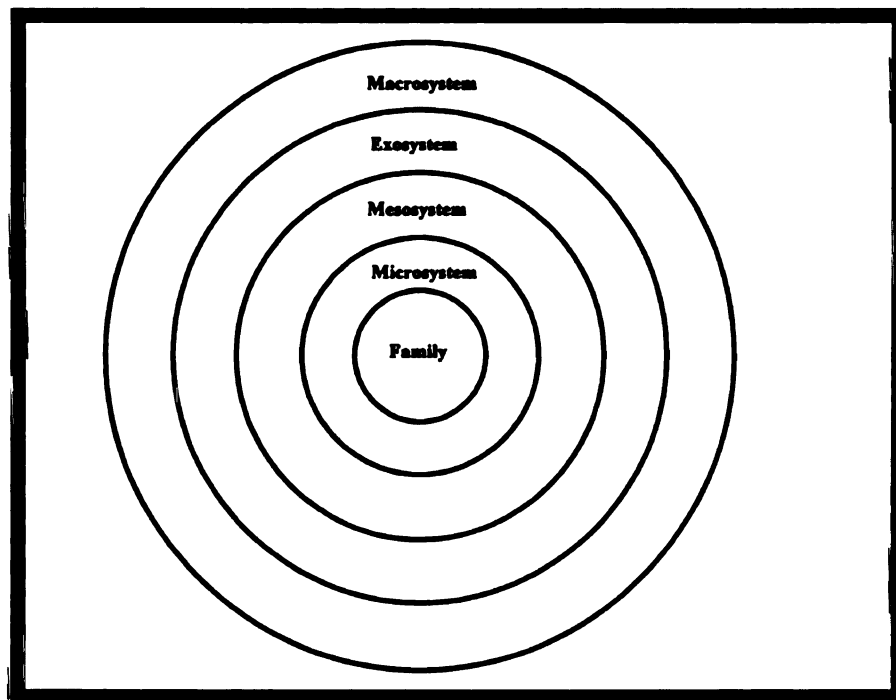


Figure 2.
The Family Ecosystem. Adapted from:
Bronfenbrenner, U. (1979) The ecology of
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The family ecosystem perspective was developed to address problems related to the family and its environments. Up to this period research delved into the family through the sum of its members therefore not looking at the unit by and of itself. This perspective allows the family to be viewed through its life cycle stages. The family ecosystem framework allows the family to be studied and assessed through its interaction and within the environment and the changes among the environments. The underlying values at the base of family ecosystem theory are those concerned with human betterment: economic adequacy, justice, freedom, and peacefulness. Family ecology's scope:

"attends to special problems of groups and subcultures who lack power, self determination, and access to resources and who experience discrimination and prejudice. These...include racial and ethnic minorities, the handicapped, women, the poor, and to old" (Bubolz & Sontag, 1993, p. 427).

The scope of the family ecosystem perspective can be addressed as a macrotheory as it allows for a broad range of phenomena to be researched "that cannot be adequately studied by using other paradigms or theories of more limited scope" (Bubolz & Sontag, 1993, p. 428). Siporin in 1979 (Grief & Lynch, 1983, p. 56) stated that the family

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ecosystem framework "accepts diverse theoretical orientations, such as psychoanalytic, problem-solving, behavioral, existentialist, and other approaches". Adolescent pregnancy, family boundary ambiguity, eldercare, child abuse, and marital discord are among the phenomena studied.

Family ecosystem theory is evolving as more scientists are utilizing the concepts and model in their studies. The theory analyzes family and describes family relationships to the environments within a circular causality and reciprocal interactional process.

The key assumptions of the family ecosystem include:

1. The family ecosystem is a semi-closed, mutually interacting group of people who have a common theme, goals, interests, and possessions.
2. "The family carries out physical-biological sustenance, economic maintenance, psychosocial, and nurturance functions for its members, for itself as a collectivity, and for the common good of society" (Bubolz & Sontag, 1993, p. 425).
3. Society is an organization of specialized, functioning parts, each of which is essential to the survival of the whole (Hawley, 1950).
4. The human enviroined unit and its environments can be viewed as nested systems that interface though the use of feedback loops.

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5. The family ecosystem is a cybernetic system. It maintains control and adaptability by informational feedback (Moran, 1982).
6. The family and its environments are dependent upon each other. The action of one part affects the actions of the other parts.
7. The family ecosystem has an adaptive nature, thus it is able to react to and respond to change within the environments and stresses within the human envired unit.
8. The family ecosystem is dynamic.
9. The family ecosystem maintains homeostasis.
10. Families interact with multiple environments (Bubolz & Sontag, 1993).
11. The family and its environments are linked by the flows of energy, matter, and information (Moran, 1982).
12. Equifinality is an integral part of analyzing family ecosystems.

The major concepts of the family ecosystem perspective include:

1. System: A group of components that interact with each other in a symbiotic relationship so that the whole is greater than the sum of the parts.
2. Ecosystem: The relationship (boundaries, interactions, and interfaces) of an organism (man, family, or organization) with its environments.

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3. Environment: "The sum total of the physical, biological, social, economic, political, aesthetic, and structural surroundings for organisms" (Bubolz, Eicher, & Sontag, 1979, p. 29).
4. Family: A semi-closed, mutually interacting system of independent personalities who have a common theme and goals characterized by long-term, intimate, reciprocal relationships occupying a common living space for a period of time and utilizing and sharing resources. They may be connected by blood, marriage, adoption, or culturally recognizable forms of unity and they share a past history, a present reality, and a future expectation, often, of transgenerational relationships (Hook & Paolucci, 1970; Melson, 1980; Kramer, 1985).
5. Interface: The area where two ecosystems share a common semi-permeable or permeable boundary that allows for exchange of data between those ecosystems or transformation of resources.
6. Boundaries: "The mechanism by which systems monitor the intake and output of information and resources" (Kostelnik, Stein, Whiren, & Soderman, 1988, p. 10).
7. Adaptation: The ability of an individual or group to change based on the stressors they encounter or the environment which has changes usually secondary to humankind's interaction with that environment.

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8. Communication: A transactional process whereby a message is transmitted from a source to a receiver via one or more channels. This message is goal-oriented and is influenced by noise or barriers that may include attitudes, beliefs, values, and cultural modes of the sender and/or receiver.
9. Social structure: "The established pattern of internal organization of any social group. It involves the character of the sum total of the relationships which exist between the members of the group with each other and within the group itself" (Fairchild, 1961, p. 293).
10. Relationship: "A tie or bond in which a person invests energy into another person, object, or activity and the formation of a commitment" (Blitsen, 1971, p. 59).
11. Energy: The exchange of heat or calories needed to transform one resource into another resource.
12. Resource: "Those tools which one has at his/her disposal to use to obtain goals or to satisfy wants or needs" (Wehlage, 1985, p. 215).
13. Time: The concept of calendar, history, future, season, pace, and duration as a dimension in which all ecosystems are involved to some extent.

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14. Human environed unit: "An individual or group of individuals who have feelings of unity, share some common resources, goals, values, interests, and have some sense of common identity" (Bubolz et al., 1979, p. 29).
15. Interaction: The exchange of energy between two or more organisms or units usually through the processes of communication or social behavior.

The family ecosystem is a construct of the family embedded in the environments, and the interactions among and between them, the components of the environments, and the family (see Figure 3) (Bubolz et al., 1979). Later theoretical formulation by Bubolz and Sontag has adapted the environments:

1. Natural environment to natural physical-biological.
2. Human constructed environment to human built.
3. Human behavioral environment to socio-cultural.

For this paper the former descriptions are used for ease in synthesizing the family ecology framework and the Neuman system model. Each of these will be discussed in brief.

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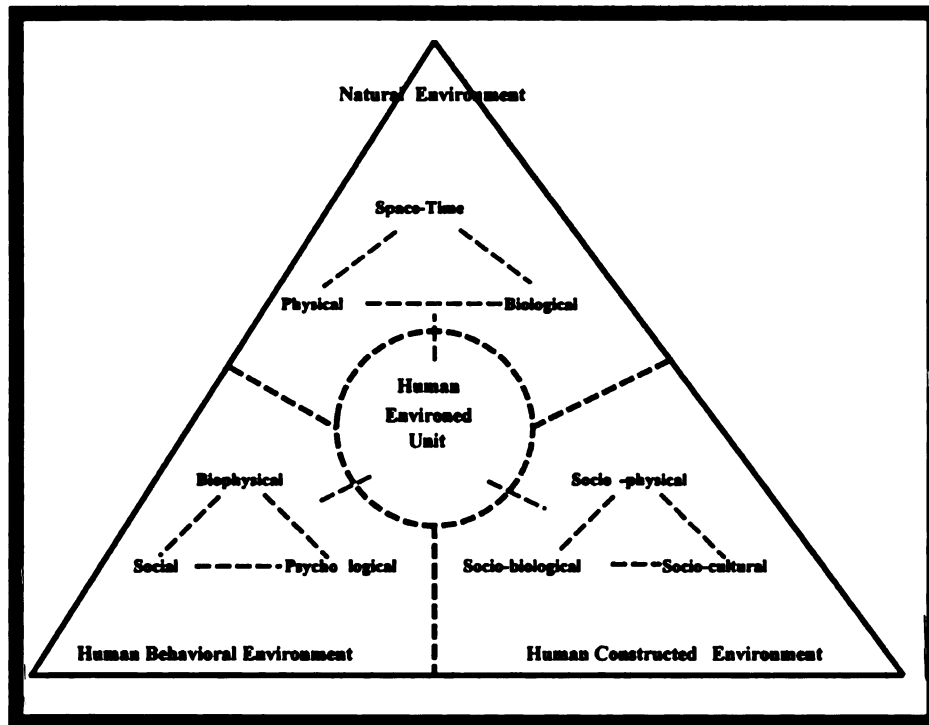


Figure 3.
The Human Ecosystem. Adapted from: Bubolz,
 M., Eicher, J., & Sontag, M. (Spring, 1979).
Journal of Home Economics. p. 29.

Family Unit

The family unit is located at the core of the family ecosystem. Family is defined by the concept *human environed unit*. Based on general systems theory, the whole is greater than the sum of the parts. Therefore, in the family ecosystem the family unit is greater than the sum of the individual members. Also based on systems theory, a change in any one part will produce change in the whole.

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Thus, in the family ecosystem, a change in any individual such as adaptive behavior, will produce a change in the entire family. The family processes are regulated by the dimensions of energy, space, and time. According to Melson (1980, p. 173):

"the perception of energy resources is limited, not only by family perceptual style, sensory awareness, information seeking, and the life, but also by the family's links to the other environmental systems within which it is embedded--the legal, economic, education, and political systems".

The social mechanisms of energy include fueling, investing, and mobilizing (Kantor & Lehr, 1975). Fueling is concerned with the acquisition of energy. It involves surveying, tapping, charging and requisitioning. Energy investing consists of reconnoitering, attaching, committing, detaching, and accounting. Energy mobilization involved gauging, budgeting, mustering, transforming and distributing.

Melson (1980, p. 75) defines space as "the process by which family members act on and in their spatial environment". This process addresses three separate but interrelated concepts of territorial space, personal space, and privacy. These concepts are further divided into the components of bounding, linking, and centering (Kantor & Lehr, 1975). Bounding is the boundary regulation component

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of the family. It consists of four mechanisms: mapping, routing (the direction of traffic within the home and family), screening (permeability of the boundaries), and patrolling. Linking is the regulating of distance. It has five mechanisms: bridging, buffering, blocking out, channeling, and recognizing. Centering is the organizing of the space in which the family lives. It includes locating, gathering, design, arranging and spending.

The time dimension has three components: orienting, clocking, and synchronizing. Orienting consists of four mechanisms: past, present, future, and non-temporal. Clocking is keeping track of date, day of week, and time through the use of sequencing, duration and pacing. Synchronizing includes setting, coordinating, and programming. Thus these three dimensions of energy, space and time are "the physical media through which each family system marks off its pathways for obtaining the goal they seek" (Hill, 1984, p. 9).

Environment

The environment can be structurally divided into three sub-environments that are both distinct yet interrelated. These sub-environments are the natural environment, human constructed environment, and the human behavioral environment (Bubolz et al., 1979).

The natural environment "supports human life in that it provides the energy and materials on which all life depends" (Bubolz et al., 1979, p. 29). Three components help to regulate life: space-time, physical, and biological. Space-time is concerned with the "three-dimensional expanse in which events occur and in which matter and energy exist" (Bubolz et al., 1979, p. 29) and the duration and sequencing of those events. The physical component addresses the living organisms of plants and animals that help to regulate the natural environment.

The human constructed environment is defined by Bubolz et al. (1979, p. 29) as "an environment altered or created by human beings". Three components: socio-physical, socio-cultural, and socio-biological, are concerned with the prevalent systems of humankind--agriculture, business-economics, politics, education, medicine, religion, and technology. The socio-physical component specifically addresses modifications to the environment in terms of roads, cultivation of the land, buildings, clothing and technological machines. The socio-cultural component is concerned with aesthetics--language, law, and social institutions. The socio-biological component encompasses modifications to plants, animals, and humans through the use of genetic engineering and programs such as reforestation.

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The human behavioral environment is "the environment of human beings and their biophysical, psychological and social behaviors" (Bubolz et al., 1979, p. 30). The components address the family structure--family form, size, living space, and territoriality--and the socialization (the social component), attitudes, values, and beliefs (the psychological component), and population--density, age, fertility rates, family planning, and body movements--posture (the biophysical component) (Bubolz et al., 1979; Hildebrand, 1987).

The conceptualization of these environments suggests that they are structurally separate, but in reality they are embedded within each other and are essential in providing the family with the resources necessary for life. The environments pose limitations and constraints, possibilities and opportunities that guide the family in its decision-making behavior (Bubolz & Sontag, 1993).

Interaction

The central mode of the family ecosystem framework is interaction. (The interactions are characterized by the dotted lines in Figure 3). Interactions occur in five ways: (Borland, 1987):

1. Interaction within the family unit.
2. Interaction between the family unit and the environments.

3. Interaction within one of the environments.
4. Interaction among the environments.
5. Interactions between family units.

These four ways are not distinct but can occur simultaneously. One of the assumptions regarding family ecosystems is the idea of cybernetics. This notion is inherent to this component. Information enters the family unit through inputs from the environments as matter and energy and as feedback from family processes. The family examines this information that "moves them to either change its patterns of internal organization, rules, goals, and external relatedness or try to maintain its previous patterns (Bubolz & Whiren, 1984, p. 6). The result of family decision-making is then returned to the environments as output in the form of transformed energy (as material goods, information, waste products, and human resources). These outputs in turn are utilized by the environments and by other ecosystems (Andrews, Bubolz, & Paolucci, 1980). The family ecosystem is dynamic thus the cybernetic process is a constant, at times unconscious, state of exchange. However, the family ecosystem attempts to maintain homeostasis so there is a state of relative balance and stability throughout this interactive component.

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Neuman Nursing Systems Model Framework

Neuman's systems model (NSM) is a nursing conceptual model that was first published in article form in 1972 by Neuman and Young for graduate nursing education (Neuman, 1972). The article, *A model for teaching total person approach to patient problems*, introduced the nursing world to a wholistic approach to clients, environments, and stressor relationships. Over the next two decades the model expanded into one of the three most utilized nursing models for nursing research internationally (Beckman, 1994). The model is amenable to interdisciplinary use throughout health and human services research (Neuman, 1982).

The model can be described as either grand or macro theory due to its origins and applications. Betty Neuman drew upon major theories in the development of her model:

- Gestalt: From which the concepts of wholism, perceptual fields, and homeostasis are borrowed.
- Selye's stress theory: The stressors and their relationships to woman and her environment form the basis of the NSM.
- Wiedenbach: Neuman used this theory to link the nursing process to stressors and interventions. She also adopted the validation of client behaviors and perceptions with client cooperation as a central tenant in the NSM.

- Systems: General systems theory ties the theory and concepts together in an open dynamic system that is in a state of equilibrium with the environment. It provides the unifying focus of non-summativity (where the whole is greater than the sum of its parts).

Neuman's model views each client (individual, family or community) as "a core surrounded by three hypothetical boundaries--lines of resistance, normal line of defense, and flexible line of resistance" (Thibodeau, 1983, p. 106) that protect, buffer, and defend against stressors--intrapersonal, interpersonal, and extrapersonal, in the environment. The role of the nurse is to provide interventions through primary, secondary, and tertiary levels of prevention thus assisting the boundaries to maintain or return to an optimal wellness state for the client (see Figure 4).

The key assumptions of the Neuman Systems Model include:

1. The client is in a dynamic energy exchange with the environment (Neuman, 1989b).
2. Each stressor is different in its potential to disturb an individual's equilibrium or normal line of defense (Fawcett, 1986).

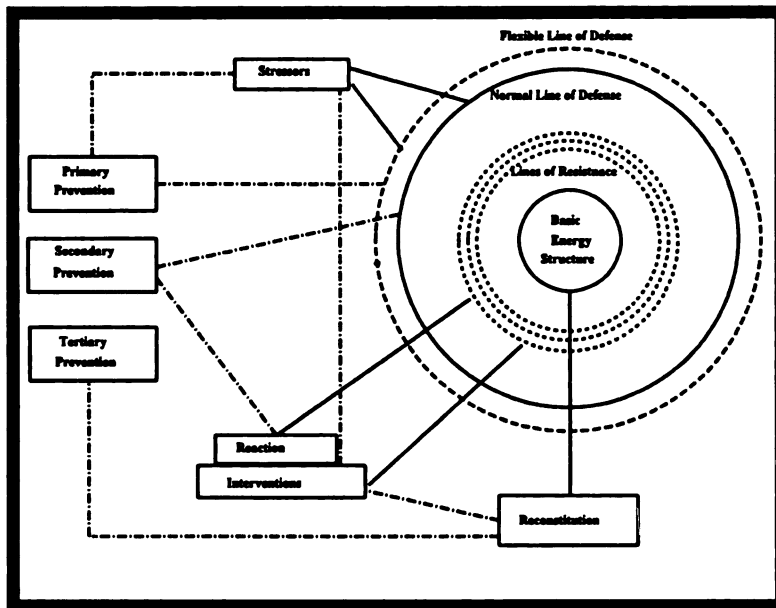


Figure 4.
Neuman System Model. Adapted from: Neuman,
 B. (1979). Nursing Research, 21(3).

3. Each system is a dynamic composite of the interrelationships between physiological, psychological, socio-cultural, developmental and spiritual variables that are present at all times and determine the nature and degree of the systems' reaction to the stressor (Fawcett, 1986).
4. Each client, over time, has evolved a normal range of responses which is referred to as the normal line of defense or wellness (stability state).

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5. Each client system has a set of internal resistance factors (lines of resistance) which function to stabilize and return the client to the normal line of defense or possibly to a higher level of stability following an environmental stressor reaction (Neuman, 1989b).
6. There are internal, external and created environments in which the individual maintains varying degrees of harmony and balance between the three.
7. The client is in a reciprocal relationship with environment by interacting with this environment through adjustment or accommodation (Marriner, 1986).

The major concepts in understanding the complexities of the Neuman systems model include:

1. Stressors: Tension-producing stimuli that have the potential for creating disequilibrium, situational or maturational crises or the experience of stress.
2. Basic structure energy resources: Basic survival factors or energy resources that are unique to the individual but within a common range of responses (Marriner, 1986).
3. Flexible lines of resistance: Internal factors that help the person defend against a stressor.

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4. Normal line of defense: The state of wellness or adaptation the person has maintained over time that is considered normal for that person.
5. Flexible lines of defense: Protective buffer for preventing stressors from breaking through the solid line of defense.
6. Degree of reaction: A person's relationship to stress.
7. Reconstitution: The state of adaptation to stressors in the internal and external environment.
8. Intervention: Activities that reduce the person's encounter with the stressor and/or strengthens the lines of defense to reduce the reaction.
9. Wholism: Viewing a person or subject in its entirety as a unit that can't be divided into its component parts without destroying its integrity (Barnum, 1987).

The Neuman systems model is a construct of three components that guide the nursing process: person, environment, and stress. Each will be described briefly and in relation to the nursing process.

Person

The Neuman systems model views nursing as the profession that emphasizes the "wholeness" of the individual, thus maintaining and promoting wellness through the interrelationships of the variables and moving the patient towards negentropy. Energy moves either toward

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extinction (entropy) as in a closed system by gradual disorganization, increasing randomness, and dissipation, or toward evolution (negentropy) as a system absorbing energy increases its organization and complexity and develops toward a more steady or wellness state (Neuman, 1989b).

Negentropy and entropy are on the opposite ends of a health or wellness continuum. Homeostasis preserves the character of this system so that an adjustment in one direction is countered by a movement in the opposite direction, both movements being approximate rather than compensatory. This homeostasis is dependent on the interrelationships of the variables that compose a person. In systems theory it is the whole of the parts rather than the sum of the parts that provide the essence of the person. Neuman (1989b, p.10) states:

"Wholism is both a philosophical and biological concept, implying relationships and processes arising from wholeness, dynamic freedom, and creativity in adjusting to stress in the...environment."

Nursing emphasizes the wholeness of an individual in the maintenance and promotion of health. The profession examines the variables that influence an individual's response to life cycle events. It is through this examination that assessment occurs and a data base is established to develop diagnoses and client-centered goals, plan nursing interventions, and evaluate outcomes. The variables are the

central core of the basic energy structure:

- Physiological--Body structure and function, age, sex, gender, and metabolic function.
- Psychological--Mental processes, attitudes, feelings, and relationships.
- Sociocultural--Combined social and cultural functions which encompass lifestyle patterns, ethnic and cultural background, geographic and economic factors.
- Developmental--Growth patterns and maturation levels.
- Spiritual--Values and beliefs that integrate all the other dimensions of the person (Corrine, Bailey, Valentin, Morantus, & Shirley, 1992).

Thus each client is viewed wholistically:

"As a unique, feeling individual with potentials for strength, wisdom, and untapped resources. Health is the maintenance of the dynamic relationship of body (developmental and physiological variables), mind (psychological and sociocultural variables), and spirit (spiritual variable) in a constantly fluctuating society and environment" (Blattner, 1981, p. 13).

Environment

Fawcett, (1986, p. 150) defines environment as:

"the viable arena which has relevance to the life space of an organism."

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In the Neuman model, as in general systems theory, a person is in interaction with the environment, interfacing with it through assimilation or accommodation. Accommodation is the process of adjusting behavior to adapt to environmental changes whereas assimilation is the process of adjusting or changing the environment to meet an individual's needs (Thibodeau, 1983).

The environment can be sub-divided into three parts-- internal, external, and creative environments. The internal environment consists of all forces or interactive influences internal to or contained within the boundaries of the client system. The external environment consists of all the influences that exist outside the boundary system. Connecting and intersecting these two environments is the creative environment. The creative environment involves the exchange of matter, energy, and information through the process of cybernetic feedback implicit in general systems theory. Neuman describes the creative environment in her 1989 model expansion (Neuman, 1989b, p. 32):

"The creative environment...is a symbolic expression of system wholeness. It acts as an immediate or long-range reservoir for existence or the maintenance of system integrity expressed consciously, unconsciously, or both simultaneously. This environment represents the client's unconscious mobilization of all system variables, including the basic structure energy

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factors, toward system integration, stability and integrity. It is inherently purposeful though unconsciously developed, since its function is to offer a protective shield or safe arena for system function. It is spontaneously created, increases or decreases, as warranted by a special condition or need. It supersedes or goes beyond the internal and external environments encompassing both."

The model reflects the environmental influences on health. The client is in a constant state of change with reciprocal environmental interactions, always moving either toward a dynamic state of wellness or toward illness. Health is reflected in the level of wellness on the continuum of entropy and negentropy. When system needs are met a state of optimal wellness exists, conversely, unmet needs reduce the wellness state. Nursing interventions are directed toward counteracting entropy and are based on nursing assessment and the client's perception of unmet needs and environmental influences with a view toward meeting desired goals and outcomes.

Nursing interventions are purposeful actions (levels of prevention) to help the client maintain, attain, and/or retain system stability. The three levels of prevention are (Marriner, 1986; Hall & Weaver, 1985):

1. Primary: Strategies that focus on altering environmental factors prior to the loss of health or the onset of illness.
2. Secondary: Strategies to reduce the prevalence of entropy by either altering the factors which led toward illness or by early diagnosis and treatment thus minimizing the adverse effects and controlling complications.
3. Tertiary: Strategies to reduce the residual effects of the illness, minimize the loss of function, and to return recovered individuals to society at an optimal level of wellness.

Stressors

Stressors are tension-producing stimuli with the potential for causing disequilibrium (Neuman, 1989b). The three types of stressors are (Cross, 1985):

1. Intrapersonal: Forces occurring within the individual: anger, physical abilities, coping mechanisms, values, beliefs, fears, and health needs.
2. Interpersonal: Forces occurring between two or more individuals such as parent-child relationships, role expectations, emotional support, and relationships with others.

3. Extrapersonal: Forces occurring outside the individual: unemployment, peer pressure, housing needs, and community influences.

The concept of wholism (non-summativity, the interrelationships of the variables in the basic energy structure core, and the environments) determine the amount of resistance the client has to stressors and whether a reaction will occur. All stressors have a potential for reaction but the lines of defense determine the reaction outcome. The flexible lines of defense are dynamic and rapidly altered to provide a buffering effect against the stressor or stressors. This flexible line of defense is easily influenced by physical impairments such as inadequate rest, poor diet, or alterations in activities of daily living (Louis, 1989). When these impairments are present, the stressors can easily penetrate through to the normal line of defense. The normal line of defense represents a unique stable state for the client. It identifies whom the person has become over time--thus the steady state, lifestyle, coping patterns, developmental and spiritual influences, and cultural identity. (Beckman, Boxley-Harge, Bruick-Sroge, Harris, Hermiz, Meininger, & Steinkeler, 1994). Entropy or illness occurs when this line is penetrated. The body's next line of defense moves in but the ability to cope with additional stressors is greatly reduced. The lines of resistance are the resource factors

that help a person defend against stressors. When these lines are penetrated, entropy and often death occur unless immediate interventions are enacted.

The penetration of these lines of defense is based on the time of stressor occurrence, the past and present condition of the person, the nature and intensity of the stressor, and the amount of energy required for accommodation or assimilation. Thus the entire nursing process (assessment, diagnosis, goals, interventions, and outcomes) is put to work. Nursing diagnosis requires a thorough assessment of the client. This assessment is based on data received from nursing's perception of the client as well as the client's perceptions of his or her own unique characteristics or variables and the ability to focus on the processing of stressors that influence the stability of existing patterns. Thus nursing assessment is the first step of the nursing process and includes:

1. Knowledge of all the factors influencing a person's perceptual field.
2. The meaning a stressor has and what is seen as a consequence of the present situation.
3. Support mechanisms, to include past coping patterns, social support systems, and how similar stressors were handled in the past.

Establishment of a nursing diagnosis is the second step of the nursing process and includes:

1. Identification and resolution of perceptual differences between the nurse and the client.
2. Identification of the potential or actual stressor.
3. Determination of a woman's level of wellness (her strengths, positive adaptations, and health behaviors).

The third step includes the delineation of goals and interventions to assist in meeting those goals. These goals are accomplished through nursing interventions that have their roots in public health theory: levels of prevention. The levels of prevention--primary, secondary and tertiary--are on a continuum and encompass one another through a reciprocal energy exchange to promote health and wellness.

Collaboration occurs between the nurse and the client to identify goals and intervention strategies. Reconstitution or the return of the body system to stability is the primary goal of nursing interventions. Reconstitution may occur at, beyond, or below the woman's normal line of defense. The second goal is to reduce or minimize risk factors and adverse conditions. The third goal is to reduce the degree of reaction to a stressor (Thibodeau, 1983).

Health promotion or primary prevention should work in concert with secondary and tertiary prevention to prevent recidivism and to promote optimal wellness (Neuman, 1989). Primary intervention strategies that strengthen the flexible lines of defense include (Fawcett, 1986):

1. Classifying stressors as to client system threat to stability and prevent stressor invasion.
2. Providing information to maintain or to strength existing client system strengths.
3. Supporting positive coping and functioning.
4. Desensitizing existing or possible noxious stressors.
5. Motivating toward wellness.
6. Coordinating/integrating interdisciplinary theories and epidemiological input.
7. Educating/re-educating.
8. Using stress as a positive intervention strategy.

Secondary intervention strategies successful in strengthening the normal line of defense include (Fawcett, 1986):

1. Following stressor invasion and protecting basic structure.
2. Mobilizing and maximizing internal/external resources toward stability and energy conservation.
3. Facilitating purposeful manipulation of stressors and reactions to stressors.

4. Motivating, educating, and involving the client in health care goals.
5. Facilitating appropriate treatment/intervention measures.
6. Supporting positive reactions toward illness.
7. Promoting advocacy through coordination and integration.

Tertiary intervention strategies required to strengthen internal lines of resistance include (Fawcett, 1986):

1. Attaining or maintaining maximum level of wellness and stability during reconstitution.
2. Educating, reeducating, and reorienting as needed.
3. Supporting the client in appropriate goal directedness and change efforts.

The fourth step is evaluation of outcomes. Attainment of goals is evaluated following interventions as a basis for confirming or reformulating of goals and interventions.

Outcomes are the end-result of care or a measurable change in the health status or behavior of clients. The four types of outcome evaluation are (Jones, 1993):

1. Clinical--Client's response to health and human service needs.
2. Functional--Maintenance or improvement of physical functioning.
3. Financial--Achievement of outcomes with most efficient use of resources.

4. Perceptual--Client's satisfaction with outcomes, care received or provided.

Summary

The family ecosystem framework is the basis of client and family-centered approaches to care. The model provides the construct of the family and the environments in which the family is embedded. The central mode is interaction--among, between, and within environments and other ecosystems. The Neuman system's model utilizes the nursing process to strengthen the ecosystem's lines of resistance and defense thus promoting or maintaining wellness. The integration of these two unique but complementary models is the foundation of community-based case management.

Case Management Synthesis

Case management is an approach to the coordinating and delivering of health and human services. The approach proposed is characterized by client and case worker interactions over time toward mutually agreed upon goals. The intent is to assure that all clients receive the services necessary for their health and well-being (Interagency agreement, 1990).

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Case management is a tool of this century. Seventy years ago, social work pioneers emphasized the need to consider the total family to assess individual problems and to mobilize community resources to develop a network of supportive services (Kirkhart & Rudolph, 1989). However, it wasn't until the past decade that case management entered the maternal-child health arena. Public Law 99-272 (Consolidated Omnibus Reconciliation Act) mandated that case management services be covered under Medicaid (Kirkhart & Rudolph, 1989, p. 30):

"States will be allowed to cover case management services without regard to requirements that Medicaid services be available throughout a state...Case management services will be services which assist individuals eligible under Medicaid in gaining access to needed medical, social, educational and other services".

October 1986 saw further legislation under P.L. 99-457 (Education for the Handicapped Act) which provided a family-centered care approach to case management. Several states began to develop case management services in maternal-child health by the end of decade: New Mexico, New York, Illinois, and Texas.

Comprehensive, community-based case management networks relevant community and county agencies to plan strategies and collaboratively work with the client to prevent adverse pregnancy outcomes by (Culpepper & Jack, 1993):

1. Determining risk status of the pregnant woman and her family.
2. Ensuring that women and their families are educated regarding risk and modification strategies.
3. Developing a comprehensive care plan that integrates medical, obstetrical, and psychosocial care.
4. Providing intervention required for risk reduction.
5. Assisting in reducing barriers to service.
6. Providing timely follow-up and monitoring of care.

Case management services are directed toward the client who has multiple service needs that cannot be met by the individual care provider. For the pregnant woman who is high-risk for medical, psychosocial, and/or obstetrical factors, thus high-risk for poor perinatal outcomes, case management is essential.

Community-based case management expands the process of individual case management as traditionally performed within an organizational structure. A tri-level approach allows for service delivery (see Figure 5). An umbrella agency eliminates many barriers that inhibit effective utilization of preventive services (fragmented services, inadequate resources, duplication of efforts, and interaction among and

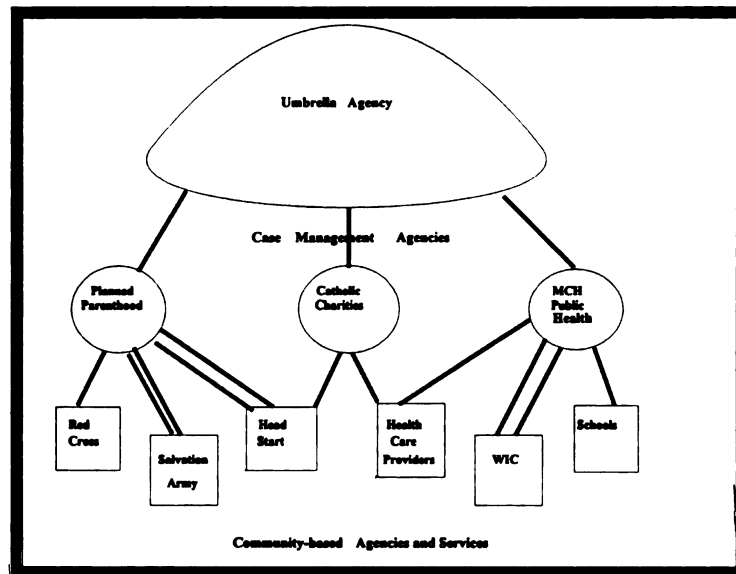


Figure 5.
Community-based case management: A schema.

between agencies) by forming a network of health and human service providers who provide a multidimensional approach to family needs. This agency develops policy, intervention strategies, and work plans, designs outreach, and analyzes data in terms of maternal and child mortality and morbidity. The case management agencies provide services of assessment, diagnosis, goal setting, and intervention strategies with client participation and keeps comprehensive data on referrals, dynamics of services and outcomes. The community-based agencies identify at-risk pregnant and parenting women referring them for case management services.

In turn, these agencies receive referrals for services from the case management agencies.

Case management can be conceptualized as an integrated delivery network that:

1. Is internally managed.
2. Provides a continuum of providers to meet population needs.
3. Develops service integration and linkages.
4. Coordinates care that ensures clients receive adequate services appropriately.
5. Ensures quality through uniform data analysis and accountability.

An integrated service network allows health and human service providers to respond to the unique needs of their local service areas and clientele (Setting relationships right, 1993).

The implementation of case management is the five step process of assessment, diagnosis, goal setting, intervention, and evaluation within the ecosystem of the client (see Figure 6). The successful application of case management is dependent on the integration of the case manager, the service delivery system, and the client.

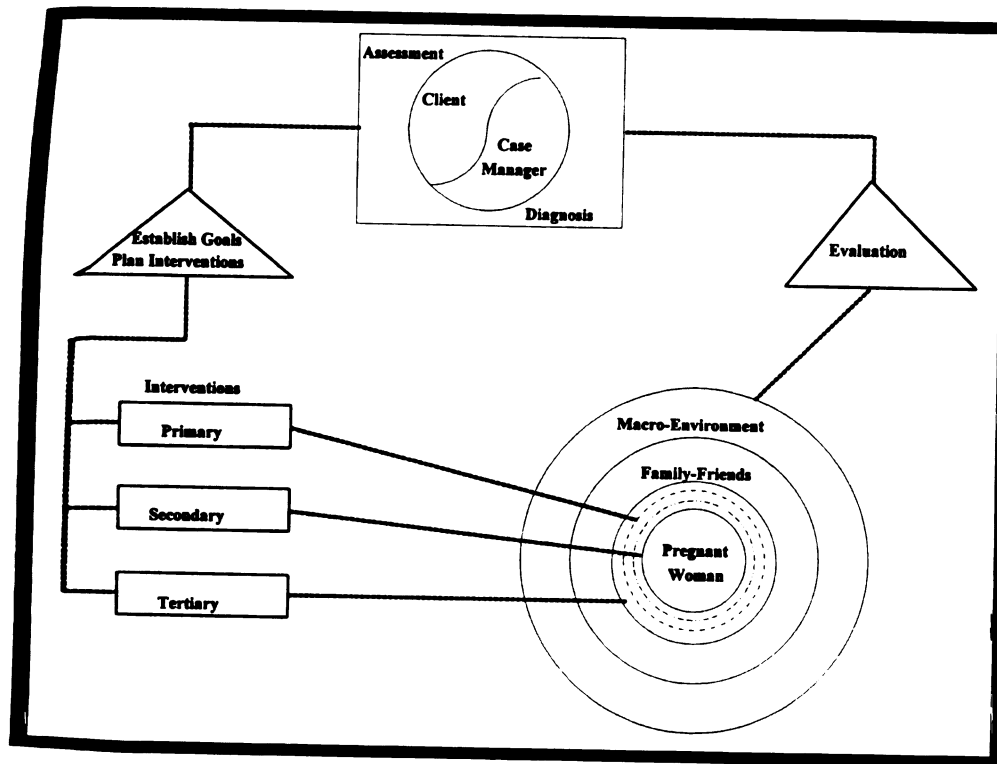


Figure 6.
Conceptual Model: Comprehensive Community-Based
Perinatal Case Management.

Assessment and Diagnosis

The case manager in a community-based case management delivery system may come from health care, human services, or community outreach. The case manager must be able to perform a thorough assessment, establish an advocacy relationship, understand community resources, circumnavigate complex multiple service systems, direct goal setting, develop a plan of care, and evaluate outcome criteria. The case manager spans boundaries, incorporating the social system approach into practice while learning how to move freely within and across the systems in all their complexities (Cervera & Videka-Sherman, 1989). The case manager is the catalyst in the implementation of case management that improves perinatal outcomes.

The family ecosystem model provides the framework the case manager needs for assessment of the pregnant woman. This model brings into purview the complex ecological system. The model focuses on the sources of nurturance, stimulation, and support which are essential for survival (Kumabe, 1989).

At the central core of the family ecosystem model is the human enviroined unit--the pregnant woman. This core contains the essence of woman--her physiological, psychological, developmental and spiritual being that has been molded by culture, ethnicity, relationships,

occupation, and socioeconomics. It is a fluid and dynamic state that responds to ideas, feelings, and events. The pregnant woman is nested within the environments of the family that act as stressors of melioris--"experiences which promote well-being and protect against effects of stressors" (Bubolz & Sontag, 1993, p. 433). Together the case manager and the pregnant woman examine the ecosystem along with the traditional assessment of medical-nursing history and family strengths and resources to determine the level of wellness. Together they assess the impact of potential or actual stressor on the lines of defense (see Figure 7). The Neuman system model requires a thorough assessment of concurrent stress and identification of coping responses, resources, and options (lines of resistance). Assessment of concurrent stressors involves examining the occurrence of responses to ordinary life stresses (concerns about medical care, finances, sense of being overloaded with responsibilities). Stressful events are those perceived as involving harm, loss, threat, or challenge (Knox & Snowden, 1989). Diagnosis, therefore, develops from the assessment of the pregnant woman, her uniqueness, and responses to stressors.

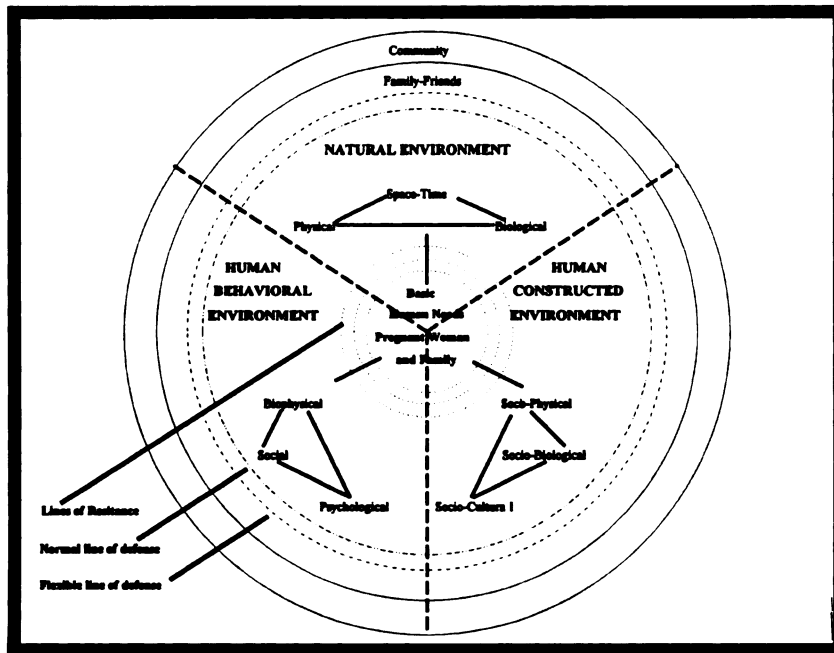


Figure 7.
The Human Enviroined Unit: Model Synthesis.

Goals and Interventions

The next step is goal identification and planning of interventions. This step includes identifying resources, establishing and prioritizing goals and developing specific steps to reach these goals, establishing time lines for goal completion, and developing alternative plans. An essential part of goal identification is the reality check--making sure goals reflect where the woman is and where she wants to be. Goal identification often includes the techniques of reframing and relabeling. Reframing allows the woman to see that change is possible and that she has the ability to

impact that change. Relabeling emphasizes the positive by focusing on the benefits of change (Kumabe, 1989). These two steps assist in empowering the woman to take action for improved perinatal outcome.

Intervention planning includes referral (linking the woman with needed services in the community), follow-up, advocacy, and supportive counseling. Integrating the interventions of all disciplines into the plan promotes coordinated care and negates the potential for fragmented care (Nugent, 1992). Interventions are targeted toward the lines of defense to support and strengthen them. Primary interventions support a family's strengths and assist in building the family's capacities (Anderson et al., 1991). These interventions include health education, nutrition, psychological support, adequate housing, recreation, employment, and preventive physical exams. Secondary interventions are aimed at the lines of resistance reinforcing and strengthening the family's ability to relate to each other, treating illness, and mobilizing resources from environments that interface and interact with the pregnant woman and her family. Tertiary interventions occur when some degree of reconstitution or stability has returned. Tertiary interventions attain or maintain a maximum level of wellness by supporting the family in goal directedness and change efforts (Fawcett, 1986) through parenting education, educational advocacy and job training.

These intervention strategies gain support in the family ecosystem framework process of adaptation:

"Survival, quality of life, and conservation of the environment, including the sustained yield of natural resources, depend on the ways and means by which humans achieve adaptation. Attention is given to the importance of selective perception, values, decision-making, and human actions as they influence adaptation and selection and use of resources as means toward attainment of goals, satisfaction of needs, and quality of the environment" (Bubolz & Sontag, 1993, p. 422).

Each intervention is planned with the client. The pregnant woman and her family are the decision-makers. Family ecology stresses that decision-making is the central cybernetic system of the family. It involves the identification, comparison and evaluation of alternatives and the choice of one of the alternatives. When a decision has been made the family evaluates this decision (usually unconsciously or informally) by the consequences or sequelae that arise. This evaluative process may lead to change within the family ecosystem and thus creates dynamic interactions.

Evaluation

The final step is that of evaluation. Evaluation is dependent upon continuity of care between the case manager, the woman, and community organizations. Evaluation assesses how well goals are being met, if intervention strategies need to be changed, and if goals need to be readdressed or discarded. The evaluation of client outcomes is both formative and summative. Formative evaluation is focused on implementation of the case management process while it is being delivered and while it can still be modified. Summative evaluations are terminal evaluations that occur after a client is discharged from case management, including not only the quantity of care, but the cost effectiveness of that care (Nugent, 1992). These steps are on a continuum interfacing the wellness continuum. As a woman achieves an optimal state of wellness, the case manager withdraws from her environment, summarizing where the woman has been, is, and where she is going.

Community-based, comprehensive perinatal case management within the context of the two theoretical models, Neuman systems model and family ecology framework, promotes a community-wide approach to improving perinatal and family outcomes through the management of stressors that impede the pregnant woman in obtaining health and human services. The synthesis of these two frameworks provides guidance in designing, delivering and evaluating services for families

utilizing a multidisciplinary perspective. The model synthesis recognizes the influence of family attributes, activities, and processes on the quality of family life. It allows exploration into "activities and processes that facilitate accessing, creating, utilizing, and preserving resources for the purpose of...family betterment" (Westney, 1993, p. 450). Comprehensive perinatal case management promotes the wellness of the family ecosystem facilitating interdependent and competent family function within the environments using available resources to maintain a state of wellness.

CHAPTER 4

STATEMENT OF THE PROBLEM

Purpose

The synthesized conceptual framework of case management will guide the author in her investigation to determine if comprehensive community-based perinatal case management affects the perinatal and family outcomes of prenatally at-risk clients.

Hypotheses

To meet the objectives of this research, the following hypotheses are proposed:

- H₀₁ There is no relationship between receipt of comprehensive community-based perinatal case management services and birth outcomes.
- H₁₁ There is a positive relationship between receipt of comprehensive community-based perinatal case management services and birth outcomes.

This hypothesis has found support through the Consensus Conferences. Their report *Access to prenatal care: Key to preventing low birth weight states* (Curry, 1987, p. viii):

"Increased access to prenatal care is an important and necessary step in reducing the incidence of low birth weight babies born in the United States.

Assuring that all women and children have access to basic life needs, including food, clothing, shelter, and health care, is essential to improving the health of pregnant women and of the present and future children of the nation".

Sharp (1993) points out that the rate of low birth weight infants began to increase during the 1980's, while at the same time, the proportion of women receiving early and continuous prenatal care declined significantly. McLaughlin et al. (1992) studied the effect of comprehensive prenatal care on birth weight using a randomized design. They found the comprehensive prenatal care was related to higher birth weights for primigravidas (women with a first pregnancy) but not for multigravidas (women with second or greater pregnancy). A study done by Parker and Abrams (1992) compared national guidelines formulated for weight gain by the Institute of Medicine and actual weight gain from women who delivered in California in 1988. They found that low maternal prenatal weight gain was associated with a more than double risk of a small-for-gestational age infant (SGA) and high maternal prenatal gain with both a doubled risk of large-for-gestational age infant (LGA) and a 20-30% increased risk of cesarean section. McDonald, Armstrong,

and Sloan (1992) found that smoking accounted for 39% of low birth weight infants for gestational age, 35% of low birth weight infants, and 11% of preterm births. Depressive symptoms and thus associated poor health behaviors that are a link to infant outcomes were studied by Zuckerman et al. (1989). They found that depressive symptoms were significantly associated with being single, older, unemployed, and having a lower income, but not with a mother's education or age.

As a subset for the above hypothesis, the following hypotheses are also proposed:

H₀₂ Among pregnant teenagers there is no relationship between birth outcomes and the receipt of community-based comprehensive prenatal case management services.

H₁₂ Among pregnant teenagers there is a positive relationship between birth outcomes and the receipt of community-based comprehensive prenatal case management services.

McAnarney and Hendee (1989) found that infants who were born to mothers less than 15 years of age were more than twice as likely to weigh less than 2500 grams at birth and are nearly three times more likely to die within the first 28 days of life. Felici et al. (1981) study of adolescents found that environmental factors influence the incidence of low birth weight babies. They went on to find that comprehensive

prenatal care programs resulted in 9% of the teens having low birth weight babies as compared to the 20.9% of the control group.

H₀₃ There is no relationship between receipt of community-based comprehensive prenatal case management services and family stability.

H₁₃ There is a positive relationship between receipt of community-based comprehensive prenatal case management services and family stability.

This hypothesis has found support with the Zuckerman et al. (1989) study on depressive symptoms during pregnancy and the link to infant outcomes. They found that the number of homes in which a woman had lived in the past three years was positively associated with symptoms of depression. A 1983 study for the National Governors' Association found that women living in poverty areas in the United States were three times more likely to receive no prenatal care as compared to women living in non-poverty areas (Hutchins, 1985). The Alan Guttmacher Institute reports that sixteen percent (16%) of women at risk for unintended pregnancy had a family income below the federally designated poverty level and another twenty-six percent (26%) were relatively close to the poverty level (Klitsch, 1993). However, a study of live births in Tennessee during 1984-1987 showed that Medicaid enrollment expansion did not improve the use of early prenatal care nor improve birth weight of neonatal

mortality rates (Piper, Ray, & Griffin, 1990).

Transportation was one of the barriers to obtaining adequate prenatal care found in the Oregon study by Harvey and Fober (1993). Bullock and McFarlane (1989) developed a study to determine if the stress of physical abuse would affect the incidence of low birth weight. They found that battered women gave birth to low birth weight infants nearly twice the rate that of non-battered women. Another study addressed social support in the home in preventing preterm births, but they found no correlation between the two (Bryce, Stanley, & Garner, 1991). The Second National Family Violence survey found that violence during pregnancy occurred frequently: 154 acts of violence per 1000 women during the first four months of pregnancy and 170 acts of violence per 1000 women during the fifth through ninth months (Newberger et al., 1992).

As a subset of the above, this hypothesis is proposed:

H_{04} Among pregnant teenagers there is no relationship between receipt of community-based comprehensive prenatal case management services and family stability.

H_{12} Among pregnant teenagers there is a positive relationship between receipt of community-based comprehensive prenatal case management services and family stability.

Welcher, in her analysis of studies at Johns Hopkins in 1982, noted that adolescent mothers who completed high school and had used contraception regularly also had higher self-esteem and clearer, more realistic goals than other teen mothers (O'Sullivan & Jacobsen, 1992). A study of former adolescent mothers at 20 years long-term follow-up for the Young Mother's Program (one of the first comprehensive programs for pregnant teens in the United States in 1967-1969) found that those who attended and completed the program had higher educational aspirations for themselves and their children (Horwitz et al., 1991). Ambler and Dull (1987, p. 206) examined the research on teen-age pregnancy and educational status. They summarize:

"Parenthood before age 18 reduces high school completion rates by 50% for women and 25% for men and reduces income by 80% for families headed by teenaged mothers".

Conceptual Definitions

The major variables to be investigated are birth outcomes (dependent variable), family stability (dependent variable), and prenatal care services (independent variable). Figure 8 illustrates the variables and their factors within the model synthesis. These variables are defined conceptually and operationally:

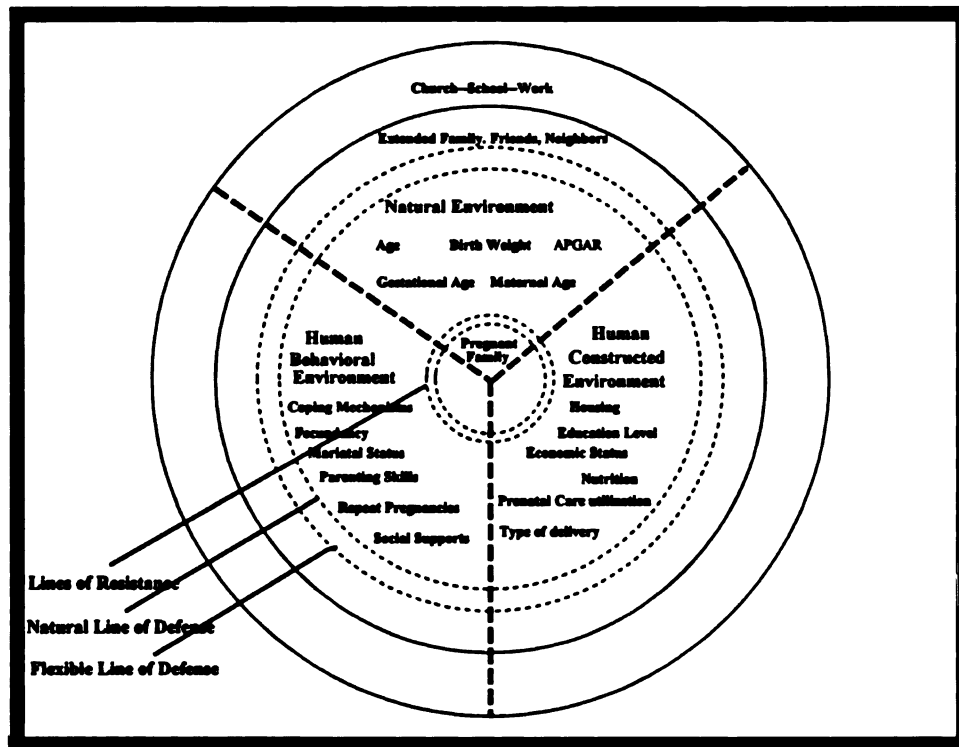


Figure 8.
Model Synthesis: Variables and Factors Under Study.

BIRTH OUTCOMES: Conceptually, birth outcomes are defined as the status and well-being of the infant at the time of birth. An optimal birth outcome is an infant born after the completion of thirty-seven weeks gestation with APGAR scores seven or greater at one and five minutes, and with a birth weight above 2500 grams (Frigoletto & Little, 1988; Arias, 1993). Operationally this is defined as the gestational age in weeks, birth weight in grams, one minute APGAR score, and five minute APGAR score.

FAMILY STABILITY: Conceptually family stability is defined as the family's ability to enhance the competence of their members to cope with the demands of other organizations in which they must function, to utilize these organizations, and to provide satisfactions and a mentally healthy environment intrinsic to the well-being of the family. It assumes that sustenance in the form of food and protection for physiologic survival is essential. Operationally this is defined as living situation, parenting, financial situation, employment, health status, personal development, and education.

PRENATAL CARE SERVICES: Conceptually prenatal care services are the health and human services received during the antepartal period of pregnancy. Conceptually prenatal care services are defined as case-managed services, comprehensive services, and routine obstetrical services. Routine obstetrical services are those prenatal services rendered by a board-certified/eligible obstetrician-gynecologist. They include high-risk screening and treatment/referral, pregnancy-related examinations and testing, and counseling for pregnancy-related conditions such as premature labor, genetics, labor, and family planning. Comprehensive services are those services rendered by an on-site multidisciplinary health care team consisting of a registered dietitian, medical social worker, WIC intake worker, nurse educator, Medicaid examiner, PCAP

examiner, genetic counselor, and OB-GYN advanced registered nurse practitioner or certified nurse-midwife. These services include nutritional counseling, family-partner-individual counseling and treatment, assessment and enrollment in Medicaid and/or PCAP as well as food stamps and HEAP, genetic counseling and testing, WIC enrollment to include receipt of WIC checks and services, prenatal education program for early pregnancy and prepared childbirth classes (with individual teen prenatal education program), educational advocacy, assessment for preparation of new family member, referrals for employment and training, and medical prenatal care services for low to moderate pregnancy risk clients with physician co-management for high pregnancy risk clients. Case management services include all comprehensive services plus community-based case management for continuity of health and human services to provide advocacy, brokering, and linkage by the case manager for the pregnant woman and her family over an established period of time. Case management agencies specific to this study include the Maternal Health Center (the site for comprehensive prenatal care services), Catholic Charities, Planned Parenthood's Circle and TASA programs, Jefferson County Public Health Department (with liaison with Public Health Departments of St. Lawrence, Lewis, and Oswego Counties), and North Country Children's Clinic's Adolescent

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Pregnancy Program. Other agencies that provide case management services but are not included in interagency agreements are the Oswego County Options Program, Mercy Mental Health, and Cornell Cooperative Extension.

Case Management in the North Country

Case management is an approach to the coordination and delivery of health and human services characterized by client/worker interactions over time toward a mutually agreed upon goal whose intent it is to assure that every client receives all of the services necessary to health and well-being (Interagency agreement, 1990).

The North Country Prenatal/Perinatal Council, Inc. (NCPPC) is one of New York state's comprehensive prenatal/perinatal networks that is funded through the Department of Health. The NCPPC covers a three-county area in Upstate New York. (Jefferson, St. Lawrence, and Lewis counties are outlined on the map in Figure 9). The tri-county area has a population of approximately 250,000 people with 93.6% White. Twenty-two percent of the population are females of childbearing ages (15-44 years of age). Although only a small percentage of the populations of Lewis and St. Lawrence counties, Ft. Drum U.S. Army Installation brings in a population of approximately 25,000. Perhaps due to the close relationship to Canada (Jefferson and St. Lawrence counties border the provinces of Ontario and Quebec),

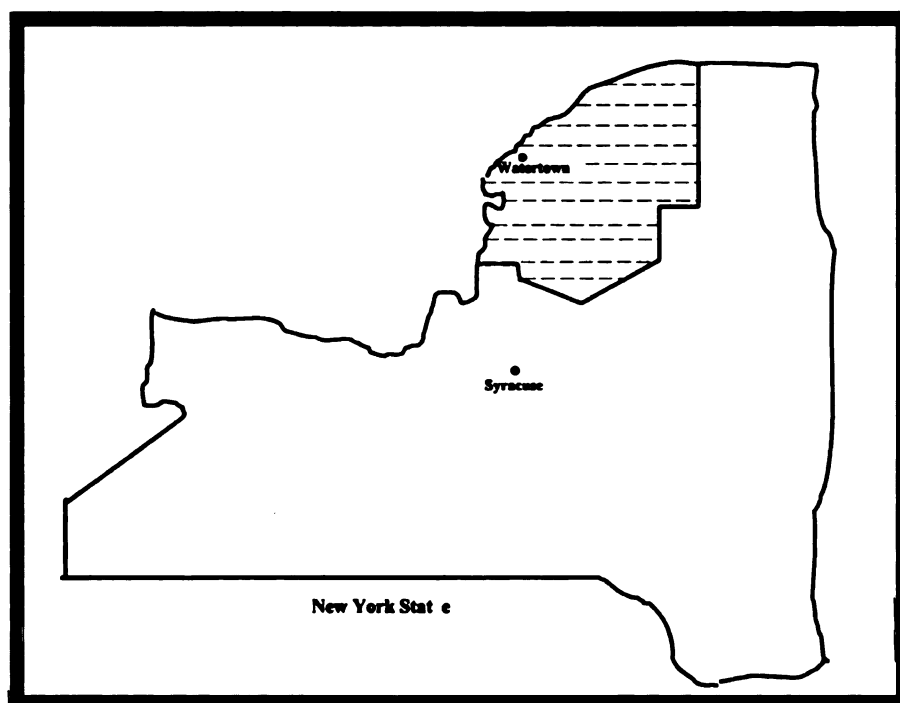


Figure 9.
North Country Prenatal/Perinatal Council,
Inc. Tri-County Area Map.

foreign-born citizens account for three percent of the population. The average per capita income is \$25,000 for households and \$29,200 for families, however, 10.9% of the families reside in poverty (U.S. Department of Commerce, 1993). Table 3 describes the demographics per county. Many consumers from Northern Oswego county utilize the service of the NCPPC due to geographical access. The NCPPC functions as the coordinating council for health and human service provisions for pregnant women and their children.

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Table 3.
Tri-County Population Demographics

	Jefferson County	Lewis County	St. Lawrence County
Population	110,943	26,796	111,974
Percent by Race			
White	91.2	98.7	96.7
Black	6.0	.3	1.6
Native American	.4	.2	.8
Asian	.8	.5	.6
Hispanic	2.7	.5	1.1
Females			
(age 15-44)	24,878	5775	24,780
% of pop.	22.4	21.6	22.1
Per Capita Income			
Households	\$25,929	\$25,599	\$23,799
Families	\$29,535	\$29,208	\$29,004
Percent poverty			
Entire Pop.	11.8	13.3	17.2
Families	9.5	10.4	12.8

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The case management model developed by the NCPPC utilizes a systems approach that resembles Bronfenbrenner's nested ecosystem model approach (see Figure 10). Each

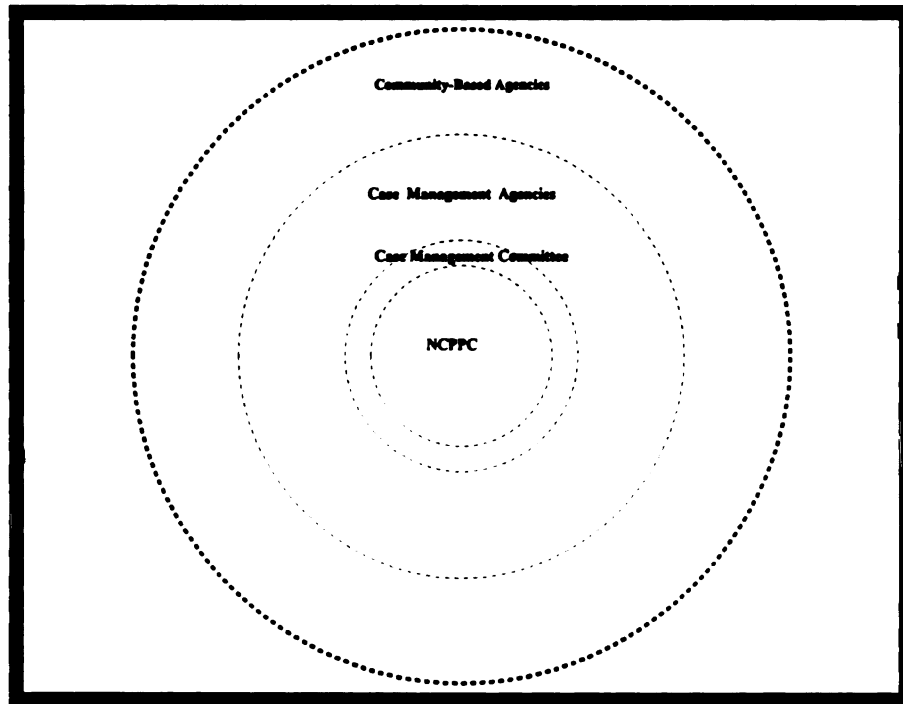


Figure 10.
Case Management Model of the North Country
Prenatal/Perinatal Council, Inc.

system interfaces and integrates its services with the other in a cybernetic environment. Community-based organizations are educated by the NCPPC to identify psycho-social and socio-economically at-risk pregnant and parenting clients. They refer clients into case management as well as receive referrals from specific services from case managers. The case management agencies are contracted by NCPPC for individual or group case management. The case manager works

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with the client in the assessment of needs, diagnosis of problems (potential or real), planning for intervention strategies, and evaluations of services and goals. The case manager initiates referral for community services (see Table 4). The case management agencies keep comprehensive data on referrals, dynamics of services, and outcomes. These agencies present their data to the case management committee for assessment and recommendations to the NCPPC. The NCPPC Board takes the recommendations from the case management committee to develop policies and community and regional intervention strategies as well as provide integration and coordination among community-based organizations. Table 5 identifies community organizations involved in the NCPPC. The North Country Prenatal/Perinatal Council, Inc. is a new organization that originated in 1989 in response to New York state's Governor Mario Cuomo's 1986 State of the State Address to reduce maternal and infant mortality and morbidity. This organization originated through the passage of a bill in the New York legislature that expanded Medicaid eligibility to 185% of poverty for pregnant women and infants through the first year of life (Randolph & Sherman, 1993). In the first year of implementation the program developed rapidly and established itself in the community (Blodgett, 1991):

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Table 4.
Community Service Referrals of the North Country
Prenatal/Perinatal Council, Inc.

Types of community service referrals	
Primary health care	Educational services
Prenatal care	Life skills
WIC	Housing assistance
Infant/child health care	Adoption services
Crisis intervention	Income maintenance
Counseling	Emergency Food
Rape crisis	Childbirth classes
Family planning	Job training/employment
Substance abuse services	Youth services
Domestic violence services	Transportation
Mental health services	Medicaid/Public assistance
Parenting classes	Emergency shelter
Child abuse/neglect prevention/protection program	Expanded food/nutrition program (EFNEP)

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Table 5:
Case Management Organizations of the North Country
Prenatal/Perinatal Council, Inc.

Community-Based Organizations

Salvation Army	WIC
Head Start	Housing Authority
Area churches	Community Action Council
YWCA	Domestic Violence Program
Food Bank	House of the Good Samaritan
Area schools	Department of Social Services
Health care providers	Mercy Mental Health
Alcoholics Anonymous	Chrysalis
US Army, Ft. Drum	Cornell Cooperative Extension

Case Management Agencies

Catholic Charities
 Maternal Health Center
 Lewis County Public Health
 Jefferson County Public Health
 North Country Children's Clinic
 St. Lawrence County Public Health
 Planned Parenthood of Northern New York

North Country Prenatal/Perinatal Council, Inc. Board

A. Barton Hospital
 Catholic Charities
 American Red Cross
 E. J. Noble Hospital
 Maternal Health Center
 Consumer representatives
 Lewis County Opportunities
 Lewis County Health Department
 North Country Children's Clinic
 St. Lawrence Psychiatric Center
 South Jefferson School District
 Private physician representatives
 Jefferson County Health Department
 St. Lawrence County Health Department
 Planned Parenthood of Northern New York
 St. Lawrence Department of Social Services
 Alcohol and Substance Abuse Council of St. Lawrence

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1. A data base was developed to track birth outcomes and to evaluate issues affecting service delivery and to analyze relationships.
2. Public service announcements on expanded PCAP (prenatal care assistance program), Medicaid, effects of alcohol in pregnancy, and WIC outreach.
3. Professional conferences were given on prenatal drug and alcohol use.
4. Development of early pregnancy classes.
5. Development of a resource library in each of the three counties for clients and professionals.
6. Publication of New Parent News.
7. Collaboration with community education programs:
 - a. Health fair with Jefferson County Council on Alcoholism.
 - b. Fetal alcohol syndrome awareness campaign with Kiwanis.
 - c. Development of prenatal care information and assessment packet with Head Start.
 - d. "Babies and You" project to area schools in cooperation with the March of Dimes.
8. Training of case managers.

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Since its development the NCPPC has impacted the community through a variety of programs and services (Blodgett, 1993):

1. Expansion of community based organizations.
2. Alcohol education program given at WIC sites.
3. Nurturing program for teens implemented.
4. Development of a personal pregnancy manual.
5. Public service announcements on "Don't Shake the Baby" and teen pregnancy.
6. Provided annual conferences on teen sexuality.
7. Coordinated HIV education program at Jefferson Community College's Women's Health Conference.
8. Expanded early pregnancy educational sites.
9. Applied and received grants for:
 - a. Smoking cessation program in pregnancy
 - b. Lead program
 - c. HIV/AIDS peer education in coordination with Red Cross and South Jefferson School District.
10. Presented paper to American Public Health Association on community networking.
11. Member of New York state task force on teen violence.

The NCPPC is a member of the Central New York Health Systems Agency (CNYHSA). The CNYHSA is "part of a network of federation of local health and human service providers and consumers who collaboratively work to identify and resolve problems of the local geographic area" (Randolph &

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Sherman, 1993, p. 74). The Executive Summary Report of CNYHSA in 1992 cited the NCPPC as a model to be adopted throughout the region. In 1994, the NCPPC was cited by the New York State Department of Health as the model agency for perinatal case management (Knight, personal communication, September 1994).

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CHAPTER 5

METHODOLOGY

Subjects

The Maternal Health Center at the House of the Good Samaritan is a nurse-managed perinatal health service agency. The center is an ambulatory clinic within a hospital setting and provides prenatal, intrapartal, postpartal, and limited family planning health care services. It is designated a "one-stop perinatal center" as it provides prenatal and postpartum health care, Medicaid eligibility determination, WIC nutritional counseling and services, adult and teen perinatal education, nutritional services, social work counseling, and teen prepared childbirth classes. Case management services are provided by two case managers. Care is provided by an obstetrical-gynecological nurse practitioner, certified nurse-midwife, registered dietitian, master's level social worker, registered nurse educator, WIC nutritional counselor, Medicaid eligibility counselor, and social services intake counselor to women of the tri-county area and northern Oswego county. Health care collaboration is provided by a board-certified obstetrician-gynecologist from OB-GYN

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OB-GYN Associates of Northern New York is a medical corporation of five obstetrician-gynecologists. They provided obstetrical and gynecological services to women of Jefferson County and surrounding communities. The medical corporation does not provide comprehensive (one-stop) services or case managers but it does participate in case management as a referral community based organization. These physicians along with the Maternal Health Center and three family practice physicians from neighboring Ft. Drum (U.S. Army installation five miles north of Watertown) provide prenatal care and delivery services to over two thousand women annually (House of the Good Samaritan, 1993).

The Maternal Health Center provides services to approximately 350 clients annually with one-third of them case managed. These case managed clients account for one-third of all the case managed clients of the tri-county area served by NCPPC (Blodgett, 1993). To be considered eligible for case management service the woman must be at-risk psychosocially, socioeconomically, or medically for poor perinatal outcomes. All women who enter prenatal care in the central New York region (see Figure 11) are assessed for risk by use of the Regional Perinatal Risk Assessment tool (see Appendix B). Women who score moderate to high are offered case management services along with selected low risk clients depending on perceived needs. Case management

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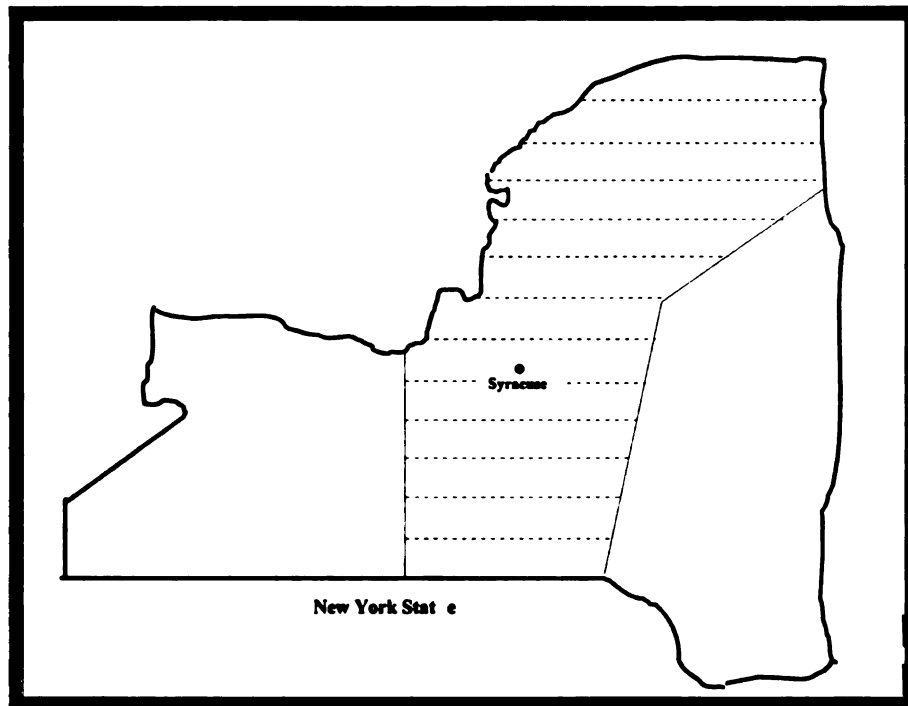


Figure 11.
Map of the Central New York Health Systems
Region.

is briefly described by the health care provider or by the prenatal care intake worker. A referral to a case management agency is made outlining initial needs of the client and/or establishing reason(s) for case management. This referral is signed by the provider and the client. The client receives one copy of the form. The provider keeps one copy and forwards the remaining two copies to the case management agency. Upon receipt of the referral form, the case management agency assigns a case manager to contact the client, explain the program, perform a needs assessment, and

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to determine intervention strategies. The client may withdraw from case management services at any time.

Subjects of the study

The data for this dissertation derive from a retrospective study of women who delivered at the House of the Good Samaritan, Watertown, New York. Subjects were drawn from case management records of the Maternal Health Center and delivery log books of the House of the Good Samaritan who received prenatal care services from either the Maternal Health Center or OB-GYN Associates of Northern New York. During the period October 1991--May 1993, 108 women who had accepted case management services through the Maternal Health Center delivered. These women ($n_1=108$) were matched to women who had received comprehensive care at the Maternal Health Center ($n_2=108$) and to women who had received obstetrical care at OB-GYN Associates of Northern New York ($n_3=108$). The women were matched on age, parity, and marital status. Women who presented with high-risk medical conditions (e.g., diabetes, cardiac disease, renal disease, chronic hypertension, and gross obesity) that are known to impact birth outcomes were omitted from the study ($n_1=8$, $n_2=14$, $n_3=12$). Women who were diagnosed during the first 20 weeks of pregnancy with obstetrical or fetal conditions (twins, incompetent cervix, fetal anomalies) that also impact birth outcomes were also omitted from the study

($n_1=3$, $n_2=7$, $n_3=2$). Initial data were collected from delivery log books from the House of the Good Samaritan, Watertown, New York. Descriptive data on birth weight, gestational age, type of delivery, APGAR scores, and intrapartum complications were obtained. Due to incomplete entries in the delivery log book several subjects from each prenatal care group were excluded leaving a final sample of 231 which consisted of 81 women who received case management services, 73 women who received comprehensive care, and 77 women who received standard obstetrical care.

Instruments

The survey instrument (see Appendix C) combined three separate tools: Regional Perinatal Assessment Form, Psychosocial Risk Form, North Country Prenatal/Perinatal Council, Inc. referral and case management forms. The survey tool also included demographic information not included in any of the other instruments.

Mawn and Bradley (1993) performed an extensive review of the literature regarding prenatal assessment tools. Their review and analysis of ten widely used risk assessment tools that contained all or part of the Institute of Medicine's (IOM) identified risk factors (see Table 6). This confirmed the 1985 IOM finding that "no consensus exists regarding any tool that is acceptable as a reliable and sensitive method

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Table 6.
Identified Perinatal Risk Factors

Socio-Demographic Factors	Medical or Reproductive Factors	Pregnancy Factors
Age <15 or >34	DES exposure	Poor weight gain
<High school education	Genital anomalies	Absent/inadequate prenatal care
Underweight	Maternal nephritis	Antepartal bleeding
Impoverished	Maternal diabetes	Placenta Previa
Smoking	Maternal heart disease	Isoimmunization
Single	Maternal hypertension	History of previous abruption
Non-White	Maternal liver disease	Prior preterm birth
Alcohol use/abuse	Incompetent cervix	Prior IUGR infant
Heavy physical work	Short interpregnancy interval <1 year	Prior low birth weight infant
Stress	Exposure to environmental toxins	Prior ABO incompatibility
<5 feet tall		History fetal or neonatal death
Substance use/abuse		Incompetent cervix

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of predicting risk in pregnant women in various populations" (Mawn & Bradley, 1993, p. 80).

The Regional Perinatal Risk Assessment Form utilized by the obstetrical health care providers in Watertown, New York was developed by the State University of New York (SUNY) Regional Perinatal Center, Syracuse, New York. This form is used extensively throughout the Central New York Health Systems Region. The tool encompasses the majority of IOM identified risk factors and expands two areas, psychosocial and nutritional factors. Clients are assessed for their risk status at their first prenatal visit. (A second assessment is performed in the third trimester but was not considered in this study.) The tool uses a summative risk score that is reflective of the identified risk (see Appendix B):

1. Low: No identified risk factors.
2. Moderate: Three or less identified risks.
3. High: A combination of four or greater moderate factors, or one high risk factor for poor outcome or low birth weight.
4. Very high: Two high risk factors for poor outcome or low birth weight, or one factor for very high risk for low birth weight.

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The psychosocial and nutritional assessment consist of several factors but each receives one score. Both assessments received further investigation by the NCPPC. While the nutritional assessment had aspects covered in the overall assessment, the psychosocial assessment addressed new factors not previously identified. It was determined by the NCPPC that more emphasis needed to be placed on psychosocial factors which are supported by findings in the literature linking low birth weight and infant mortality with hi-risk psychosocial factors. The factors identified in the Regional Perinatal Assessment Form were revised to provide a more objective scoring system. This revision was test piloted at the Maternal Health Center by a master's degree social worker with postgraduate training in family issues. This revised tool was adopted for use by the NCPPC, Inc. in 1991.

The referral and case management forms have been used within the NCPPC since 1990. The forms have been revised twice to better serve the needs of the clients, community-based agencies, and case managers as well as to increase lines of communication and clarity.

The instruments identified have not been proven statistically to be either reliable or valid, however they have been used in various practice settings to assist the health care provider in determining risk along with thorough assessments, monitoring, and clinical appraisals. Woolery

(1994) found that most preterm birth risk screening instruments currently in use have not developed scoring indices that reflect psychometric standards thus decreasing their reliability and validity. The IOM state "a well-constructed risk-assessment tool can be a useful adjunct to clinical judgment" (Mawn & Bradley, 1993, p. 80).

"Reliability is the ability of a measure to produce consistent results" (Rudestam & Newton, 1992, p. 67). The tools identify women who are at-risk for poor perinatal outcomes. Wall (1988) notes that 30% of all pregnancies are high-risk, however, these pregnancies result in only 50% of the poor perinatal outcomes. Stewart and Nimrod (1993) identify the flaw in reliability of risk scoring systems. They point out that risk scoring systems will identify only 40% of women who will have a preterm birth. Gabbe, Niebyl, & Simpson (1991) state that the most significant factor for a preterm birth is a previous preterm birth, thus showing that risk scoring of primigravidas (women with a first pregnancy) is limited in determining premature birth risk. Woolery's (1994) review of the literature found that:

"existing preterm risk screening instruments include factors that are not valid predictors of preterm-birth risk and fail to include factors reported in the literature that may be valid predictors of preterm birth" (p. 141).

While most poor perinatal outcomes are influenced by prior pregnancies, a significant number are influenced by psychosocial risks. The NCPPC suggests that with further identification of psychosocial issues and greater scoring weight an increased number of women at-risk for poor outcomes may be identified.

Validity indicates that a measure in fact measures what it purports to measure (Rudestam & Newton, 1992, p. 67). The tools utilized identify at-risk women, they do not identify perinatal outcomes. The instruments seek to explain outcomes in terms of factors that may or may not affect the outcomes. The advantage of a risk scoring instrument is that it identifies women who are at risk so that the health care provider can initiate medical, socio-economic, and psychosocial interventions and referrals thus deleting or modifying the factor(s) that may affect poor perinatal outcomes. Thus the validity of the instrument changes as intervention strategies are introduced.

Procedures

Approval of the research was obtained through Michigan State University Committee on Research Involving Human Subjects (UCRIHS) (see Appendix A). Contact was made with Ruth Ellen Blodgett, Executive President of the North Country Prenatal/Perinatal Council, inc., Linda Knight, Manager of the Maternal Health Center, Michael Golden,

Department of Medical Records at Samaritan Medical Center (formerly House of the Good Samaritan), and Drs. Sylvia Reimer and Paul Kruger, senior partners of OB-GYN Associates of Northern New York (see Appendix A). Permission was received to obtain data identified on my survey instrument from delivery logs, case management minutes, on-line case management care plans, referral forms, and inpatient and outpatient medical records.

All data were retrospectively abstracted at least one year following the birth identified during the period October 1991 to May 1993. Initially data were collected from delivery logs including:

1. Maternal age
2. Marital status at time of delivery
3. Birth weight of infant
4. Gestational age
5. Type of delivery
6. Length and type of labor
7. Intrapartal complications
8. Neonatal complications
9. Prenatal care provider
10. APGAR scores
11. Gravidity and Parity

In-patient records were then reviewed for labor and delivery course, partner/family support/involvement during labor, delivery, and/or post-partum stay, infant well-being, maternal-family-infant attachment, referrals initiated during hospitalization and intrapartum/postpartum complications or deviations from normal. Out-patient records were reviewed for antepartal course (risk status, complications, trimester of entry into prenatal care, referrals, birth plans, support systems) postpartum visit and follow-up (included patient and health care provider assessments of family interactions, infant well-being, and physical findings), family planning, progress notes from social services, public health or other referral agencies, and subsequent health or pregnancy visits. Case management records, minutes, and referral forms were assessed for reasons of entry into case management, length of time in case management, identification of case management agency and case manager, types and numbers of referrals and follow-through, and provision of care. Many times one record would have incomplete data entry but that deficiency would be addressed in another record (e.g., use of contraceptive method would not be addressed in out-patient record at time of postpartum visit but it was entered in case management minutes that the client had Norplant inserted).

The author collected all data and all patients were identified by medical record number for cross-referencing of data between resources. When all data were collected, medical record numbers were deleted and an identification number was assigned randomly within each prenatal care category. These procedures helped to insure client confidentiality.

Statistical Analysis

Data were entered for statistical analysis on an IBM compatible computer system using SPSS for Windows, Release 6.0 (Norusis, 1993a and 1993b). Descriptive statistics were analyzed for each variable using cross-tabulation and frequency distribution tables.

The principle analytic techniques for the first hypothesis regarding birth outcomes and case management perinatal care were chi-square and analysis of variance (ANOVA). The second hypothesis on family stability and case management was analyzed by chi-square. All tests of statistical inference were measured at .05 level of significance.

ANOVA uses sample data to draw conclusions about populations. The purpose of ANOVA is determine if differences between the samples are due to chance (sampling error) or to systematic treatment effects. The F statistic in ANOVA is based on variance between sample means. The

formula is (Gravetter & Willnau, 1992):

$$F = \frac{\text{variance between sample means}}{\text{variance expected from sampling error}}$$

Chi-square determine how well the frequency distribution for a sample fits the population distribution of the hypothesis. It can also determine if there is a relationship between two variables. The X^2 statistic measures how well the data fit they hypothesis:

$$X^2 = \sum \frac{(f_o - f_e)^2}{f_e}$$

The results of the statistical analyses will be discussed in the next chapter.

CHAPTER 6

RESULTS

An Overview of Demographic and Obstetrical Characteristics

Demographics

The population in the study was matched on the demographic characteristics of age and marital status. In spite of the attrition of the subjects due to high-risk medical/obstetrical conditions and/or incomplete records, the population varied only slightly. The 231 women ranged in age from 13 to 33 years at the time of delivery. The mean age was 18 years. The obstetrical care group (n=77) had 66.3% teenagers, the comprehensive care group (n=73) had 65.0%, while the case managed group (n=81) had 70.2%. Marital status also showed comparable results (see Table 7).

Statistical differences were noted when comparing educational characteristics. Obstetrical care and comprehensive care groups had a comparable percentage of subjects who had dropped out of school (24.7% and 28.8% respectively) compared to the case managed group who had a rate twice as high (50.6%). Differences were also noted in high school completion rates. Obstetrical care subjects had

Table 7.
Summary of Demographic Characteristics

Characteristic	Obstetrical n=77		Comprehensive n=73		Case Managed n=81	
	n	%	n	%	n	%
Age						
<15	8	10.4	4	5.5	7	8.6
15-19	43	55.8	44	60.3	50	61.7
20-24	20	26.0	20	27.4	18	22.2
25-29	4	5.2	3	4.1	4	4.9
30-34	2	2.6	2	2.7	2	2.5
Marital Status						
Single	61	79.2	57	78.1	66	81.5
Married	16	20.8	16	21.9	15	18.5
Educational Level						
Dropout	19	24.7	21	28.8	41	50.6
In School	24	31.2	17	23.3	17	21.0
High School Grad	26	33.7	32	43.8	20	24.7
Some College	3	3.9	3	4.1	3	3.7
College Graduate	5	6.5	0	0.0	0	0.0

¹New York State Prenatal Care Assistance Program for women 185¢ of poverty
²Active duty military and military dependents covered by CHAMPUS

a 33.7% high school completion rate, comprehensive care subjects had 43.8%, and case managed care subjects had 24.7%. Chi-square statistical analysis shows these differences in high school completion rates to be statistically significant ($X^2=7.0268$, $df=2$, $significance=.0298$).

There were major differences noted among the prenatal groups in financial payor status. The women in the two groups that obtained their prenatal care at the Maternal Health Center (comprehensive care=91.8% and case managed care=97.5%) were major recipients of health care that was paid fully, or at least substantially, by federal or state mandated health programs (Medicaid, Public Assistance, or New York State Prenatal Care Assistance Program) as compared to 57% of women who received their care from OB-GYN Associates of Northern New York.

Thus the case managed group contrasted with the other two groups in education and with obstetrical care recipients in financial payor status. The case managed recipients also had a slightly higher teenage population. Three characteristics, decreased education, lower socioeconomic status, and adolescence, are directly related to the unfavorable birth outcomes of low birth weight and prematurity (Cartwright et al., 1993; LeHew, 1992; McAnarney & Hendee, 1989; Ringdahl, 1992; Stevens & O'Connell, 1992).

Obstetrical Characteristics

The sample was matched on fecundancy. Approximately half of all the subjects were experiencing their first pregnancy with two-thirds of the women in each prenatal care group delivering their first infant. The variance in gravidity (the number of times a woman has been pregnant) and parity (the number of births) is due to abortions (any pregnancy loss prior to twenty weeks of gestation).

Comparable modes of delivery exist among the three prenatal care groups (see Table 8). Onset of prenatal care showed only slight variance between the obstetrical care and comprehensive care recipients with two-thirds of the subjects entering care in their first trimester (first 14 weeks) of pregnancy. Although slightly over half of the case managed recipients entered prenatal care in the first trimester and one-third of them entered in the second trimester, these variances were not statistically significant.

Over one-half of all the subjects had no antepartal complications. The major complications encountered are listed in Table 9. While subjects who received case management services had more complications (45.7% as compared to 32.5% for obstetrical care recipients and 41.1% for comprehensive care recipients) this was not a statistically significant difference. Few subjects from any

Table 8.
Summary of Obstetrical Characteristics

Characteristic	Obstetrical n=77		Comprehensive n=73		Case Managed n=81	
	n	%	n	%	n	%
Gravidity						
1	42	54.5	39	53.4	41	50.6
2	26	33.8	25	34.2	20	24.7
3	7	9.1	8	11.0	13	16.0
4	1	1.3	1	1.4	2	2.5
5	1	1.3	0	0.0	2	2.5
6	0	0.0	0	0.0	3	3.7
Parity at Delivery						
1	52	67.5	45	61.6	50	61.7
2	19	24.7	23	31.5	20	24.7
3	6	7.8	4	5.5	7	8.6
4	0	0.0	1	1.4	2	2.5
5	0	0.0	0	0.0	1	1.2
6	0	0.0	0	0.0	1	1.2

Table 8 (Cont'd).

Characteristic	Obstetrical n=77		Comprehensive n=73		Case Managed n=81	
	n	%	n	%	n	%
Mode of Delivery						
Vaginal	58	75.3	54	74.0	61	75.3
Vacuum Extraction	6	7.8	2	2.6	8	9.9
Forceps	1	1.3	1	1.4	1	1.2
Cesarean Section	12	15.6	16	22.0	11	13.6
Trimester Onset of Prenatal Care						
First	48	62.3	50	68.5	45	55.6
Second	18	23.4	14	19.2	28	34.6
Third	11	14.4	9	12.3	8	9.9

Table 9.
Antepartal Complications

Characteristic	Obstetrical	Comprehensive	Case Managed
	n=77 n	n=73 n	n=81 n
Oligohydramnios/ Polyhydramnios	6	3	4
Pregnancy Induced Hypertension	4	1	5
Severe Anemia	7	1	1
Gestational Diabetes	2	1	6
Premature Labor	3	5	13
Intrauterine Growth Retardation	2	1	1

of the three prenatal groups presented with intrapartal complications. While Table 10 identifies the major complications encountered in the intrapartal period it does not account for the actual clients involved as many of the complications are compounded in each pregnancy, for instance, an abruptio placenta (a condition where the placenta separates from the lining of the uterus) can also result in fetal distress and may be due to PIH (pregnancy induced hypertension.)

Table 10.
Intrapartal Complications

Characteristic	Obstetrical n=77 n	Comprehensive n=73 n	Case Managed n=81 n
Abruption	3	1	1
Pregnancy Induced Hypertension	6	4	6
Fetal Distress	4	10	5
Shoulder Dystocia	5	0	1
Malpresentation/ Malposition	1	0	2
Meconium	10	4	7
Postpartum Hemorrhage	2	1	4
Chorioamnionitis	3	4	0

Perinatal Risk Assessment

Perinatal risk assessment status was inversely related between the case managed subjects and the control subjects who received comprehensive care and standard obstetrical care (see Figure 12), however, all three prenatal groups had clients in each risk assessment category. The majority

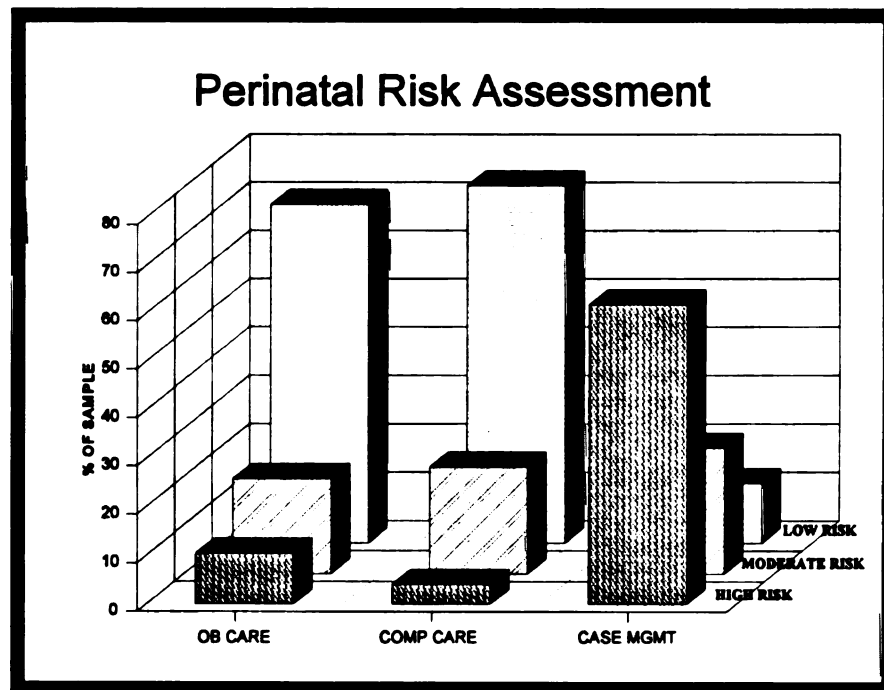


Figure 12.
Perinatal Risk Assessments by Prenatal Care Type

of the clients in the study and control groups had risk assessments that relied heavily on psychosocial and/or demographic characteristics and clients who had medical or obstetrical risk were not included in the study population. The SUNY Health Science Region Perinatal Assessment and the NCPPC Psychosocial Risk Assessment combined to give clients their perinatal risk score (see Table 11). Using chi-square analysis the results showed statistically significant differences $X^2(4, n=231) = 96.97, p < .05$.

**Table 11.
Perinatal Risk Assessments by Prenatal Care Group.**

Risk Status	Standard OB Care N=77		Comprehensive Care N=73		Case Managed Care N=81	
	n	%	n	%	n	%
Low	54	70.2	54	74.0	10	12.3
Medium	15	19.5	16	21.9	21	25.9
High	8	10.4	3	4.1	50	61.8

Birth Outcomes

Birth outcomes of completed gestational weeks, birth weight, and APGAR scores are reported using risk scores and age criteria as well as prenatal care groups. Each birth outcome factor will be discussed separately and then as a whole. The results will be discussed in terms of the hypotheses:

- H₁₁ There is a positive relationship between receipt of comprehensive community-based perinatal case management services and birth outcomes.
- H₁₂ Among pregnant teenagers there is a positive relationship between birth outcomes and receipt of community-based comprehensive prenatal case management services.

Gestational Age

There is slight variation in the number of completed weeks gestation and prenatal care groups. Infants born prior to 37 completed weeks gestation (260 days) are termed premature and considered to be at-risk for neonatal complications of patent ductus arteriosus (delayed closure of the connection between the aorta and the pulmonary artery), episodic apnea (cessation of breathing for 20 seconds or longer or less than 20 seconds when associated with cyanosis, bradycardia, and or limpness), intraventricular hemorrhage, retinopathy, and neurological

diseases (Olds et al., 1992; Gabbe et al., 1991). These infants are usually of low birth weight and require prolonged hospitalization which impacts family bonding that can have a major impact on family functioning (Gabbe et al., 1991). Infants born after 42 weeks gestation are considered postdates or post-mature and are at neonatal risk for hypoglycemia, jaundice, polycythemia, meconium aspiration, seizure activity, and cold stress due to loss of subcutaneous fat. The majority of the subjects in the three prenatal groups delivered term infants (38-42 gestational weeks) (see Table 12).

Table 12.
Gestational Weeks by Prenatal Risk Status and Prenatal Care Group

Gestational Age/Risk	Standard OB Care N=77		Comprehensive Care N=73		Case Managed Care N=81	
	n	%	n	%	n	%
Premature Total	10	13.0	2	2.7	11	13.6
Low	7		0		2	
Moderate	3		2		4	
High	0		0		5	
Term Total	61	79.2	64	87.7	61	75.3
Low	41		50		8	
Moderate	12		11		14	
High	8		3		39	
Post Dates Total	6	7.8	7	9.6	11	13.6
Low	6		4		2	
Moderate	0		3		3	
High	0		0		6	

Using ANOVA there were no statistical significant differences found between the type of prenatal care and completed weeks of gestation at birth. No significant differences were found when adolescents were analyzed separately (see Table 13).

Table 13.
Gestational Age by Prenatal Care Type Using ANOVA

	SS	DF	MS	F (obt)	F (crit)
Source:					
Entire Population					
Between Groups	.5	2	.25	.004	3.04
Within Groups	11972.5	228	52.50		
Total	11973.0	230			
Adolescent Population					
Between Groups	.5	2	.25	.007	3.06
Within Groups	5305.5	153	34.70		
Total	5306.0	155			

Birth weight

Birth weight varied somewhat between the three prenatal care groups (see Table 14). Overall case managed infants (mean = 3366.914 grams) weighed 21.7 grams more than infants from the standard obstetrical care group (mean=3345.221 grams) and weighed 142 grams less than infants from the comprehensive care group (mean=3509.137 grams). There was a

Table 14.
Birth Weight by Prenatal Risk Status and Prenatal Care Group

Birth Weight/Risk	Standard OB Care N=77		Comprehensive Care N=73		Case Managed Care N=81	
	n	%	n	%	n	%
Low Birth Weight Total	6	7.8	0	0.0	4	4.9
Low	5		0		0	
Moderate	1		0		1	
High	0		0		3	
Average Weight Total	57	74.0	62	84.9	69	85.2
Low	43		46		10	
Moderate	14		16		17	
High	0		0		42	
Macrosomia Total	14	18.2	11	15.1	8	9.9
Low	6		8		0	
Moderate	7		2		3	
High	1		1		5	

greater range of birth weights with standard care infants (482-4450 grams) and case managed infants (1645-4593 grams) as compared to comprehensive care infants (2580-5103 grams).

Using ANOVA there is no statistical significant difference in the three prenatal care groups nor when adolescents are analyzed separately (see Table 15). This can also be easily viewed by graphic analysis in Figure 13. With the factoring of birth weight, risk status, and prenatal care grouping, statistical difference by Chi-square is found that is directly related to the inclusion of risk of low birth weight and macrosomia infants. This analysis is demonstrated graphically for low birth weight and macrosomia infants in Figures 14 and 15 respectively. Chi-square analysis for low birth weight shows statistically significant findings $X^2(4, N=10)=71.21, p<.05$ and for macrosomia $X^2(4, N=33)=15.72, p<.0005$.

Table 15.
ANOVA of Birth weight by Prenatal Care Group

Source:	SS	DF	MS	F (obt)	F (crit)
Entire Population					
Between Groups	4.9	2	2.45	.003	3.04
Within Groups	202979.9	228	890.30		
Total	202984.8	230			
Adolescent Population					
Between Groups	1.0	2	.5	.012	3.06
Within Groups	6224.8	153	40.9		
Total	6225.8	155			

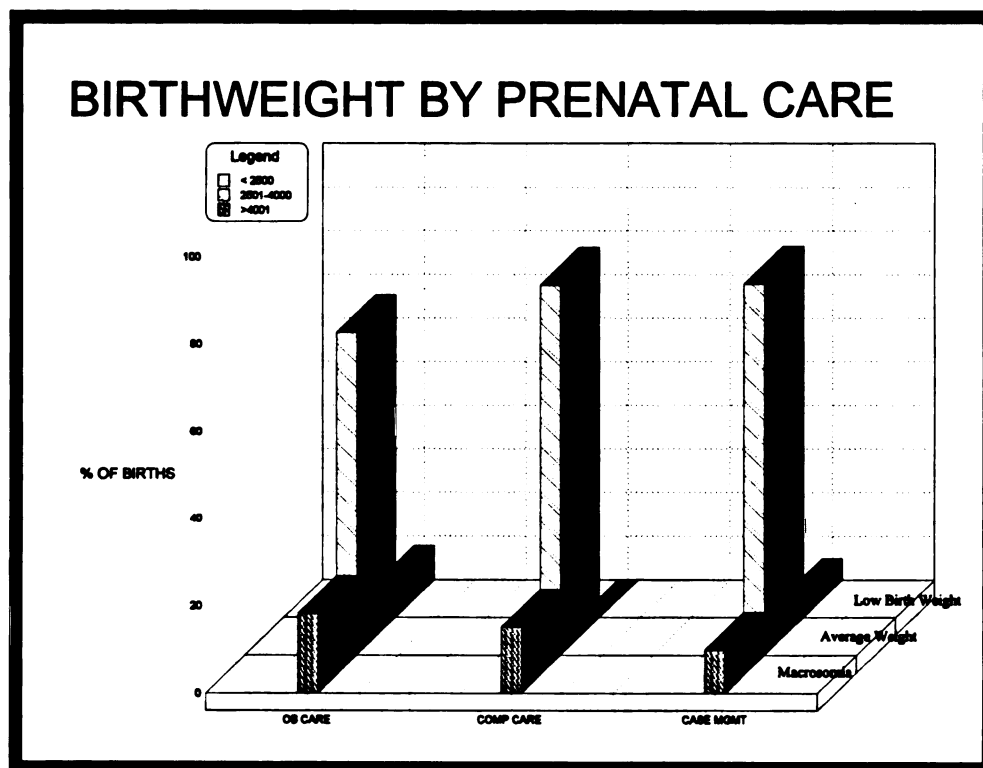


Figure 13.
Percent of Low, Average, and Macrosomia Birth
Weights by Prenatal Care Group.

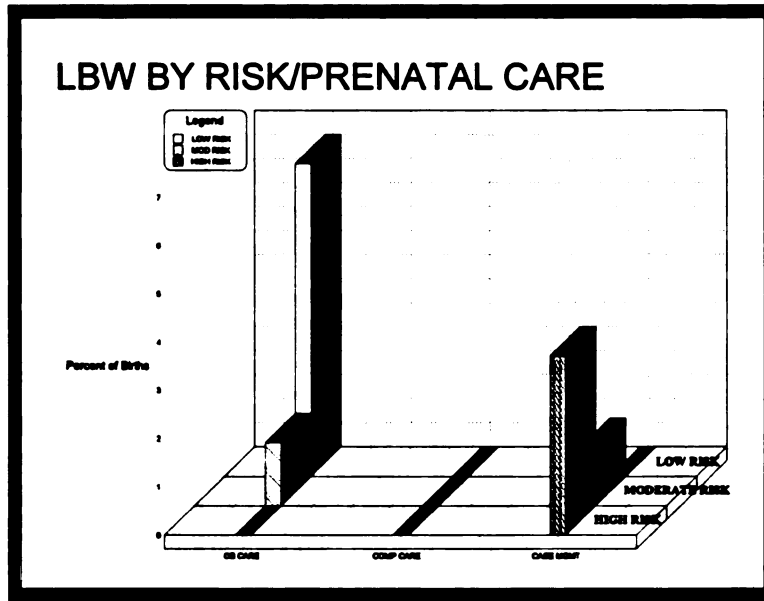


Figure 14.
Low Birth Weight Status by Prenatal Care Group and Perinatal Risk Status.

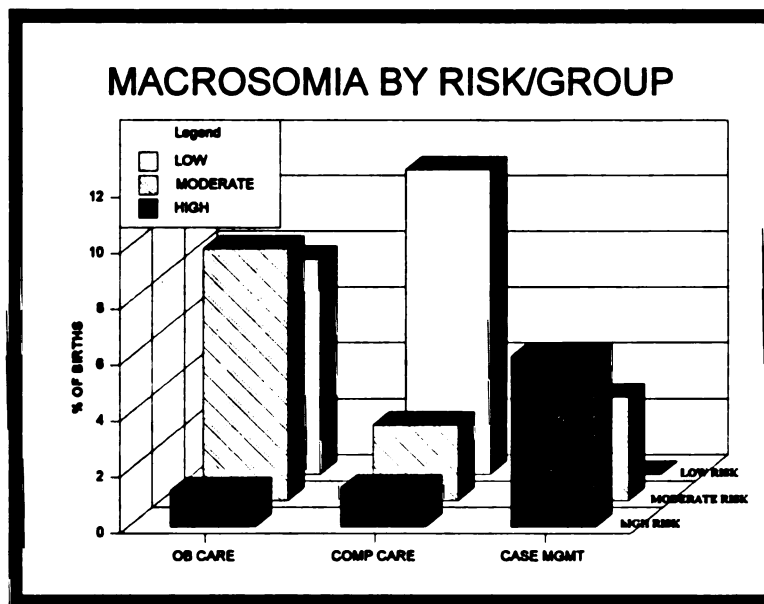


Figure 15.
Macrosomia by Prenatal Care Group and Risk Status.

APGAR Scores

There were slight differences in APGAR scores at one and five minutes of the three prenatal care groups with case managed infants scoring slightly higher means at both one and five minutes as well as less deviation (see Table 16). ANOVA statistical analysis concludes no statistical differences between the three groups for either one or five minutes APGAR scores for either the entire population or for the adolescent population separately (see Table 17).

Table 16.

Comparison of One and Five Minute Apgar Means and Standard Deviations

	Standard OB Care N=77		Comprehensive Care N=73		Case Managed Care N=81	
	Mean	SD	Mean	SD	Mean	SD
One Minute Apgar	8.03	1.60	8.18	1.28	8.38	.86
Five Minutes Apgar	8.92	1.56	9.12	.64	9.15	.57

Table 17.

ANOVA of One Minute and Five Minute APGAR Scores by Prenatal Care Group.

	SS	DF	MS	F (obt)	F (crit)
Source:					
One Minute APGAR					
Entire Population					
Between Groups	5.1	2	2.55	.001	3.04
Within Groups	510533.7	228	2239.2		
Total	510538.8	230			
Adolescent Population					
Between Groups	9.9	2	2.0	.004	3.06
Within Groups	208530.7	153	1363.0		
Total	208540.6	155			
Five Minutes APGAR					
Entire Population					
Between Groups	2.4	2	1.2	.0003	3.04
Within Groups	738985.6	228	3241.2		
Total	738988.0	230			
Adolescent Population					
Between Groups	4.9	2	2.0	.001	3.06
Within Groups	324610.0	153	2121.6		
Total	324614.9	155			

Birth Outcome as a Whole

In the examination of birth outcome as a whole rather than as the four separate parts (APGAR 1 minute, APGAR 5 minutes, birth weight, and gestational age) with the independent variable of prenatal care grouping, there are found no statistical differences between the groups using multivariate analysis (MANOVA) (see Table 18). Factoring in risk status as an independent variable statistically significant findings resulted (see Table 19).

Table 18.
Multivariate Tests of Significance for Birth Outcome and Prenatal Care Groups.

Test Name	Value	Approx. F	Hypoth DF	Error DF	Sig of F
Pillais	.036	1.041	8.00	452.00	.404
Hotellings	.037	1.033	8.00	448.00	.410
Wilks ¹	.964	1.037	8.00	450.00	.407
Rois	.022				
¹ NOTE. F. Statistic for Wilks Lambda is exact.					

Table 19.
Multivariate Tests of Significance for Birth Outcome, Prenatal Care Groups,
and Risk Status.

Test Name	Value	Approx. F	Hypoth DF	Error DF	Sig of F
Pillais	.423	12.077	10.00	450.00	.000
Hotellings	.699	15.594	10.00	446.00	.000
Wilks'	.584	13.815	10.00	448.00	.000
Roy's	.405				
NOTE. F. Statistic for Wilks Lambda is exact.					

Summary of Birth Outcomes

Analysis of the 231 subjects showed that there were no statistically significant differences in any of the four separate birth outcome variables (completed weeks gestation, birth weight, one minute APGAR, and five minutes APGAR) among the three prenatal care groups. The only statistically significant finding occurred when data were extrapolated from birth weight data however the small number of subjects makes difficult application to the general population. When factoring in for perinatal risk status, statistical significance was found in the grouped variable of birth outcome which helps to show the interactional effect of risk status on birth outcome. The birth outcome analysis shows that women who are at-risk for poor birth outcomes may have similar birth outcomes as women who use standard obstetrical care when they seek prenatal care using perinatal comprehensive care or case managed services to reduce their risk factors.

Family Stability

The variable family stability was assessed approximately one year post delivery of the infant. In this study, family stability has been identified to be the result of three major but interrelated factors:

1. Family outcomes.
2. Infant outcomes.
3. Client outcomes.

Family stability variables address the hypotheses:

H₁₃ There is a positive relationship between receipt of community-based comprehensive prenatal case management services and family stability.

H₁₂ Among pregnant teenagers there is a positive relationship between receipt of community-based comprehensive prenatal case management services and family stability.

Family Outcomes

Family outcomes refer to monogamous partner relationships, supportive nuclear/extended family, standard housing, and lack of violence in the home. In each of three categories, partner relationships, supportive family, and housing, subjects in case managed groups had increased variance from the other subjects (see Table 20). This variance was not found to be statistically significant

except for teenagers in the standard housing factor (see Table 21) Over 18% of teenagers who received case managed services live in substandard housing as compared to 3% of teens receiving comprehensive services and 0% of teens who received standard obstetrical care. The fourth factor, the presence of domestic violence in the home (by either a family member or partner) showed remarkable variance in the case managed subjects for both the entire population and for the teenage population. Approximately 15-17% of case managed clients reported domestic violence. This factor was also proven to be statistically significant at $p < .01$ for teens and $p < .005$ for the entire population.

Table 20.
Frequency Distribution for Family Outcome Factors.

Variable	OB Care		Comprehensive Care	Case Managed Care
Monogamous Partner Relationship	Yes	68.3	71.4	60.0
	No	31.7	28.6	40.0
	Yes	59.3	66.7	60.0
	No	40.7	33.3	40.0
Supportive Nuclear/Extended Family	Yes	94.1	100.0	89.8
	No	5.9	----	10.2
	Yes	90.5	100.0	85.7
	No	9.5	----	14.3

Table 20 (cont'd).

Variable	OB Care	Comprehensive Care	Case Managed Care
Has Standard Housing			
All	Yes 100.0	96.1	87.3
	No ----	3.9	12.7
Teens Only	Yes 100.0	97.0	81.4
	No ----	3.0	18.6
Experiencing Domestic Violence			
All	Yes 2.6	----	15.2
	No 97.4	100.0	84.8
Teens Only	Yes 3.8	----	17.4
	No 96.2	100.0	82.6

Table 21.
Family Outcome Factors Using Chi-Square.

Factor	df	χ^2 (obt)	Significance
Monogamous Partner Relationship			
All	2	1.81	
Teens Only	2	.48	
Supportive Nuclear/Extended Family			
All	2	5.48	
Teens Only	2	4.99	
Lives in Standard Housing			
All	2	5.38	
Teens Only	2	7.05	*
Experiencing Domestic Violence			
All	2	12.69	***
Teens Only	2	7.05	**
<p>*$p < .05$ **$p < .01$ ***$p < .005$</p>			

Infant Outcomes

Infant outcomes were assessed at birth and at least one year post delivery. Factors included care provider at birth and at one year of age, resolution of custody issues, participation of the father of the child in infant care, use of WIC (if eligible for services), and need for child preventive/protective services.

There were only slight differences in the study factors of father of child participation, care provider at birth, and unresolved custody issues (see Table 22). There were significant differences found in infant care giver at one year of age, need for child preventive/protective services, and WIC enrollment that were found to be statistically significant using chi-square analysis (see Table 23). Perhaps more dramatic is the difference noted in care provider status at birth and at one year. In each prenatal care group the parent (birth mother or father) as primary infant care provider decreased approximately 28%. The infant's grandparent(s) provided infant care to approximately 25% of all infants at one year of age.

Table 22.
Frequency Distribution for Infant Outcome Factors

Variable	OB Care		Comprehensive Care	Case Managed Care
Father of Child Participates in Infant Care	Yes	43.9	60.7	50.8
	No	56.1	39.3	49.2
Teens Only	Yes	40.5	56.4	55.6
	No	59.5	43.6	44.4
Continues on WIC	Yes	73.3	92.9	98.0
	No	26.7	7.1	2.0
Teens Only	Yes	73.0	89.0	100.0
	No	27.0	11.0	----

Table 22 (cont'd).

Variable	OB Care	Comprehensive Care	Case Managed Care
Care Provider at Birth			
All			
Parent*	96.0	97.2	89.0
Foster	----	1.4	5.0
Adopted	4.0	1.4	6.0
Teens			
Parent*	93.9	95.8	93.0
Foster	----	2.1	2.0
Adopted	6.1	2.1	5.0
Care Provider at One Year			
All			
Parent*	65.9	74.1	56.5
Gr Mom**	24.4	24.1	26.1
Foster	2.4	----	8.7
Adopted	7.3	1.8	8.7
Teens			
Parent*	55.6	74.0	52.1
Gr. Mom**	37.0	26.0	33.3
Foster	3.7	----	6.3
Adopted	3.7	----	8.3
Note. * Birth parent			
** Infant's grandparent			

Table 22 (cont'd).

Variable	OB Care	Comprehensive Care	Case Managed Care
Child Preventive/ Protective Services Required			
All	Yes ---- No 100.0	---- 100.0	12.0 88.0
Teens Only	Yes ---- No 100.0	---- 100.0	8.5 91.5
Has Unresolved Custody Issues			
All	Yes 2.0 No 98.0	4.0 96.0	10.0 90.0
Teens Only	Yes 4.0 No 96.0	6.0 94.0	9.0 91.0

Table 23.
Infant Outcome Factors Using Chi-Square.

Factor	df	χ^2 (obt)	Significance
Father of Child Participates in Infant Care			
All	2	3.39	
Teens Only	2	2.44	
Continues on WIC			
All	2	11.34	***
Teens Only	2	9.44	**
Infant Care Provider At Birth			
All	4	7.28	
Teens Only	4	1.88	
Infant Care Provider at One Year			
All	6	12.87	***
Teens Only	6	8.05	
Requires Child Preventive/ Protective Services			
All	2	11.38	***
Teens Only	2	5.29	
Has Unresolved Custody Issues			
All	2	3.76	
Teens Only	2	.99	
<p>*$p < .05$ **$p < .01$ ***$p < .005$</p>			

Client Outcomes

Client outcomes included employment or education status (dependent on age), pregnancy recidivism, use of family planning methods, need for mental health services during the first year post delivery, and involvement in legal difficulties (incarcerations, juvenile delinquency, and misdemeanor and felony arrests).

Statistically significant findings included pregnancy recidivism, employment and educational factors (see Table 24). Case managed subjects had twice as many repeat pregnancies as did the control groups (see Table 25), however, this did not hold true when teenagers were analyzed separately. Although not statistically significant, case managed subjects also had lower use of family planning methods. Employment status dropped experientially in each prenatal care group and was shown to be a statistically significant finding.

Table 24.
Client Outcome Factors Using Chi-Square.

Factor	df	χ^2 (obt)	Significance
Repeat Pregnancy Within One Year of Delivery			
All	2	6.43	*
Teens Only	2	3.64	
Uses Family Planning Methods			
All	2	2.00	
Teens Only	2	2.50	
Required Mental Health Services Within One Year of Delivery			
All	2	3.73	
Teens Only	2	1.31	
Involved in Legal Problems			
All	2	3.03	
Teens Only	2	1.01	
Continues Education/ Schooling			
Teens Only	2	6.06	*
Is Employed			
All	2	14.63	***
* $p < .05$			
** $p < .01$			
*** $p < .005$			

Table 25.
Frequency Distribution of Client Outcomes.

Variable	OB Care	Comprehensive Care	Case Managed Care
Repeat Pregnancy Within One Year of Delivery			
	Yes	22.0	29.0
	No	78.0	71.0
			43.0 57.0
Teens Only	Yes	24.0	37.0
	No	76.0	63.0
			46.0 54.0
Uses Family Planning Methods			
	Yes	75.0	66.0
	No	25.0	34.0
			62.0 38.0
Teens Only	Yes	75.0	61.0
	No	25.0	39.0
			59.0 41.0

Table 25 (cont'd).

Variable	OB Care		Comprehensive Care		Case Managed Care	
Required Mental Health Services All	Yes	3.0	4.0		11.0	
	No	97.0	96.0		89.0	
Teens Only	Yes	----	6.0		5.0	
	No	100.0	94.0		95.0	
Having Legal Difficulties All	Yes	----	2.0		6.0	
	No	100.0	98.0		94.0	
Teens Only	Yes	----	3.0		4.0	
	No	100.0	97.0		96.0	

Table 25 (cont'd).

Variable	OB Care	Comprehensive Care	Case Managed Care
Continues with Education/Schooling			
Teens Only	Yes 33.0	64.0	33.0
	No 67.0	36.0	66.0
Is Employed			
All	Yes 82.0	40.0	22.0
	No 18.0	60.0	78.0

CHAPTER 7

CONCLUSIONS

Discussion of Findings

The at-risk prenatal client suffers from poverty. This poverty may be the kind associated with lack of money or it may be an invisible type of poverty that affects wellness. Spector (1979) in the introduction to the book *Cultural Diversity in Health and Illness* describes poverty:

"The term poverty implies both visible and invisible impoverishment. Visible poverty refers to lack of money or material resources, which includes clothing, poor sanitation, and deteriorating housing. Invisible poverty refers to social and cultural deprivation such as limited employment opportunities, inferior educational opportunities, lack of (or inferior) medical services and health care facilities, and an absence of public services".

Comprehensive, community-based perinatal case management attempts to reduce the visible and invisible poverty of its clients by assisting the client through the maze of health and human services in meeting the actual and perceived needs of the client. Case management services help to empower the

woman and her family to improve the health and well-being of their ecosystem.

It is widely accepted that being teenaged, single, poor, having less than a high school education, and being of a minority race or ethnic group places a woman at-risk for low birth weight and premature infants. LeHew (1992) found that teen pregnancies are linked to high unemployment, poverty, and lack of educational attainment for the parents. He also found that the child of teenaged parents is at an increased risk for social and behavioral problems, and at risk for lower intellectual and academic achievements. Case managed clients of the Maternal Health Center are generally teens, therefore, the sample population consisted of approximately 70% teenagers--approximately 80% were single. These two factors were controlled for across the three groups. Even though the subjects were matched on these two factors the differences in their educational attainment were markedly different. Approximately 50% of the case managed clients were high school dropouts compared to 25% and 29% of the standard obstetrical and comprehensive care clients. Over 97% of the case managed clients and 90% of the comprehensive care clients received federal or state financial assistance with medical care compared to 57% of the women who received standard obstetrical care. This variance could be related to Department of Social Services intake workers recommending the one-stop shopping perinatal

services at the Maternal Health Center.

Case managed clients entered prenatal care later than did the other clients, however, most entered prenatal care prior to 20 weeks gestation. Cartwright et al. (1993) found that 5% of all teens do not receive prenatal care. Lincoln and Johnson (1987) report that women who do not obtain adequate prenatal care double the risk of having a low birth weight infant and are at risk for prematurity.

Birth Outcomes

While case managed clients had increased incidence of premature labor antepartally (13 subjects as compared to 3 and 5 for the standard OB care and comprehensive care subjects) the premature delivery rate was similar to the clients who received standard obstetrical services. This premature delivery rate (13%) is well above the national average (9.3%).

Statistical significance was found when low birth weight and macrosomia infants were analyzed. The national average for low birth weight deliveries is 12.7% (Gabbe et al., 1991). Women who received care with OB-GYN Associates of Northern New York delivered 7.8% of their infants of low birth weight as compared to Maternal Health Center clients who had 0% for comprehensive care and 4.9% for case managed care clients. It is even more remarkable that the low birth weight range for standard obstetrical

clients (who were generally at low-risk) was 468 to 2260 grams. Case managed clients (who were at high-risk) ranged from 1645 to 2360 grams. These findings are supported by Isberner and Wright (1987) who found that comprehensive prenatal care programs decrease low birth weight and prematurity. Case managed clients also had fewer macrosomia infants (9.9%). This compared significantly to both the national average of 11.4% and 18.2% and 15.1% of the standard obstetrical and comprehensive groups. It was also significant in view of the fact that the case managed clients had a higher incidence of gestational diabetes which is linked to macrosomia infants.

While APGAR scores were not statistically significant, case managed clients consistently had infants with higher scores at one and five minutes. Currently there is controversy on whether APGAR scores predict neonatal and infant mortality, however, these scores at least improve the incidence of a healthy status of the infants. Collins, Dunckel-Schetler, Lobel, and Scrimshaw (1993) report that women who received more prenatal care support delivered babies who appeared healthier at five minutes as indicated by their APGAR scores. Perhaps the involvement of the case manager with the pregnant family assists in this factor as the case manager develops a supportive relationship that lasts over several months to two years with the client.

Case management did improve the perinatal outcomes of at-risk clients in the study population. At each variable of birth weight, gestational age at delivery, and APGAR scores, case management subjects were found to have similar results to women who received standard obstetrical care.

Family Stability

Turner, Grindstaff, and Phillips (1990) found that family support is predictive of more favorable outcomes for both the infant and the teenaged mother. Supportive families were seen across the three groups, although case managed clients were perceived as having less supportive family members. Logsdon, McBride, & Birkimer (1994) found that perceptions of social support change over time. There was little difference found among the groups in monogamous partner relationships.

Statistically significant findings on domestic violence and the need for child abuse/neglect preventive/protective services point to the discrepancy of a supportive family environment. Newberger et al. (1992) studied domestic violence in pregnancy finding that as the pregnancy increases so do the acts of violence. Bullock and McFarlane (1989) also studied prenatal battering finding that low birth weight deliveries increase with battering. Few studies address battering post-delivery. Culpepper and Jack (1993) found that stress and pregnancy can alter interpersonal

relationships. It may be that the violence that began or continued prenatally may have become routine and thus continued post delivery.

Child preventive/protective services were required by case managed clients at statistically significant rates. Data obtained did not detail what services were needed nor the reasons. It was noted that there was a significant increase in the percentage of infants who were placed in foster care and who were released for adoption within the year following delivery.

Over the course of a year the primary care provider for the infant changed drastically. In each prenatal care group, the birth parent(s) turned to the infant's grandparent(s) to provide care for the infant approximately 28% of the time. This held true for both the adult and the teen populations. No data are provided to determine the factors behind this occurrence for this sample. Current research on grandparents who parent their grandchildren show that severe problems in the nuclear family (Jendrek, 1994) and parental drug addiction (Burton, 1992) are two of the major reasons.

Kalmuss and Namerow (1990) found that teenagers were more likely to have a closely spaced second birth than women who delayed childbearing to after adolescence. They also found that women who continued schooling were significantly less likely to experience a closely spaced birth. The tri-

county area of the study has the second highest teen pregnancy rate in the state (NYSDOH, 1992). (The Bronx is the highest.) It is also among the highest in the state for pregnancy recidivism among its teenagers. Case managed clients were twice as likely to have a second pregnancy within a year of delivery. The national pregnancy recidivism rate is 30.9%, well below that found in the case managed clients (43%) (Teen Parent Initiative Pilot Projects, 1991). Erickson (1994) found that teenagers who used drugs, lived in substandard housing, were illegal immigrants, resided in poverty, and were school dropouts had higher repeat pregnancy rates which correspond to many of the factors in this study.

The findings related to family stability imply that case management acts more as a response to the conditions associated with high-risk status than as a source of aid in overcoming the obstacles that caused the condition to develop. Thus the hypothesis that case management has a positive effect on family stability cannot be supported. The findings do suggest that there are positive influences on family stability.

Limitations

The study examined two important variables, birth outcomes and family stability, across three prenatal care groups of women who received varying degrees of supportive services. The major limitation found was that the client's participation in any of the three prenatal groups was due to self-selection. Selection criteria could be based on a variety of factors: previous use of a health care provider for either obstetrical or gynecological services, recommendations from family and/or friends, desire for a certain health care provider (physician versus nurse-midwife or nurse practitioner), referral into a certain program, or lack of knowledge of existence of the other prenatal care programs.

Measuring increments of medical, social, and health education services is important in determining the significance of the variables but this data is difficult to collect. The North Country Prenatal/Perinatal Council, Inc. has an extensive data base that allowed access to most of the required data. Additional data that were collected from medical records were often scanty, missing, or unreadable.

A third limitation was the inability to precisely determine the extent of prenatal care services received by the subjects. Case management and comprehensive care subjects had documented number, kind, and type of follow-up for referrals to community service agencies, as well as

client goals and perceived needs. Rarely were any referrals or social histories documented for women receiving standard obstetrical care except for those women who requested adoption services. The interaction between the case manager and the client, the health care provider and the prenatal patient, and the referral agencies and the consumer were rarely documented. Exceptions to this documentation dearth were notes by the social worker, adolescent pregnancy counselor, and the WIC counselor. Often teenage clients and a few adults had assessments performed by the public health nurses that provided much insight in the social, family, and partner interactions.

The sample used in this study may limit the generalization of the results for other populations. The population was rural-based and had long standing roots in the community. It was not unusual to have a great grandparent attend the birth of a new family member. The population resides in a climate that experiences six months of cold, snowy winter each year which limits travel outside the region. Three small sub-populations exist within the White low to middle class majority--a transient military population, an emigree population of Ukraines, and a small Hispanic community. Each of these groups resides in small closely-knit pockets throughout the tri-county region. The U.S. military and Hispanic populations are young and usually experiencing new parenthood. The military woman (active or

dependent) tends to be married with few social supports outside the military community while the Hispanic woman is usually single with a strong support system. The Ukrainian woman tends to be a grand multigravida (has had five or more births), speaks little English, has little support systems outside her family, and has limited knowledge of U.S. health and human services.

Implications

This study supports the theoretical frameworks of family ecosystems theory and Neuman's system model that show:

"Recognition of childbearing as a process that bridges social and biological domains that leads to the hypotheses that [demographic] and psychosocial factors...may also be influential in...pregnancy outcomes" (Turner et al, 1990, p. 44).

Neuman's system model incorporates well within the case management approach. It assists with better utilization of the levels of prevention. The findings of the family stability variable suggest that there is a need for increased tertiary and primary services for the at-risk client. The case managers and the North Country Prenatal Perinatal Council, Inc. can use this information to formulate new programs to address domestic violence and

child abuse/neglect. The need for public awareness and development of community programs to keep teenagers in school and to increase the availability of standard housing for teens can be addressed through the North Country Prenatal Perinatal Council, Inc. Based on research by Burton (1992) and Minkler, Driver, Roe, & Bediark (1993) grandparents who parent their grandchildren have increased needs for community support in terms of psychological, physical, and economic factors. Programs need to be developed using a community-based network such as the case management network of the North Country Prenatal Perinatal Council, Inc. for these families.

The family ecosystem framework guides the health care provider and the human services provider in their assessment of client strengths, resources, and stressors. It allows the client to be viewed wholistically and in interaction with the environments. The development of programs and the continuation of comprehensive or case management program requires the guidance of the family ecosystem framework to be successful. The whole is greater than the sum of its parts.

Further research into family stability factors needs to be addressed through controlled intervention studies to draw definitive conclusions. Valid and reliable measures need to be developed to address these factors. The incorporation of ethnographic research may assist with more objective

indicators of family stability.

Social workers, home economists, day care and school teachers, nurses, physicians, psychologists, community action workers, and politicians need to continue to work in an interdisciplinary manner through community-based action programs in interaction with consumers to continue programs that support families in empowerment. The U.S. needs to ratify the Convention on the Rights of the Child in 1995 in Egypt to declare that we are truly working toward the goal affirming "children need special care and attention...and placing emphasis on the primary caring and protective responsibilities of the family" (Haggerty, 1994).

Summary

The research examined the effects of comprehensive, community-based perinatal case management on perinatal outcomes and family stability. Women who had received case management services were matched to women who received either comprehensive or standard obstetrical care and delivered at the House of the Good Samaritan, Watertown, New York.

Drawing on the literature on perinatal risk status and associated perinatal outcomes, it was hypothesized that receipt of comprehensive, community-based perinatal case management would have a positive relationship on perinatal outcomes. It was also hypothesized that the demographic and

psychosocial factors associated with poor perinatal outcomes would improve with case management thus promoting family stability. The literature has shown conflicting effects of comprehensive care programs for pregnant women but little research on the relatively new concept of perinatal case management has been published.

The results of the study provided support that comprehensive, community-based perinatal case management does have a positive effect on perinatal outcomes especially in terms of gestational age at delivery and birth weight for the psychosocially at-risk client. Mixed support was found for the hypothesis that comprehensive, community-based perinatal case management had a positive effect on family stability. Although strong relationships were found between several measures of family stability, the relationships were due largely to demographic characteristics.

Case management programs that have integrated community networks have a positive influence in the life cycle of the childbearing family. These programs need to be identified, studied, and modeled to support the family ecosystem thus improving the health and well-being of the family.

APPENDIX A

Correspondence Related to Research Involving Human Subjects

MICHIGAN STATE UNIVERSITY

October 27, 1994

TO: Donna Scheideberg
248 Market Street
Lexington, KY 40507

RE: IRB#: 94-451
TITLE: COMPREHENSIVE PERINATAL CASE-MANAGEMENT: A
PANACEA FOR IMPROVED OUTCOMES?
REVISION REQUESTED: N/A
CATEGORY: 2-B
APPROVAL DATE: 10/21/94

The University Committee on Research Involving Human Subjects' (UCRINS) review of this project is complete. I am pleased to advise that the rights and welfare of the human subjects appear to be adequately protected and methods to obtain informed consent are appropriate. Therefore, the UCRINS approved this project including any revision listed above.

RENEWAL: UCRINS approval is valid for one calendar year, beginning with the approval date shown above. Investigators planning to continue a project beyond one year must use the green renewal form (enclosed with the original approval letter or when a project is renewed) to seek updated certification. There is a maximum of four such expedited renewals possible. Investigators wishing to continue a project beyond that time need to submit it again for complete review.

REVISIONS: UCRINS must review any changes in procedures involving human subjects, prior to initiation of the change. If this is done at the time of renewal, please use the green renewal form. To revise an approved protocol at any other time during the year, send your written request to the UCRINS Chair, requesting revised approval and referencing the project's IRB # and title. Include in your request a description of the change and any revised instruments, consent forms or advertisements that are applicable.

PROBLEMS/CHANGES: Should either of the following arise during the course of the work, investigators must notify UCRINS promptly: (1) problems (unexpected side effects, complaints, etc.) involving human subjects or (2) changes in the research environment or new information indicating greater risk to the human subjects than existed when the protocol was previously reviewed and approved.

If we can be of any future help, please do not hesitate to contact us at (517)355-2180 or FAX (517)356-1171.

Sincerely,

David E. Wright
David E. Wright, Ph.D.
UCRINS Chair

DEW:pjm

cc: Lillian Phoenix



OFFICE OF
RESEARCH
AND
GRADUATE
STUDIES

University Committee on
Research Involving
Human Subjects
(UCRINS)

Michigan State University
225 Administration Building
East Lansing, Michigan
48824-1045

917/266-7180
FAX 517/432-1171

248 Market Street
Lexington, Kentucky 40507

Ms. Linda Knight, ARNP
Director, Maternal Health Center
House of the Good Samaritan
830 Washington Street
Watertown, New York

Dear Ms. Knight:

I am a doctoral student at Michigan State University, East Lansing, Michigan. I am preparing to do my dissertation on Community-Based Comprehensive Perinatal Case Management and the impact it may have on birth outcomes and family stability. Since your program has been cited by the New York State Department of Health as a model agency for one-stop perinatal services and community-based case management services I would like to collect my data from your clients. I understand you are also vice-president of the North Country Prenatal-Perinatal Case Management Agency. My data collection will consist of the following:

1. Review all inpatient and outpatient medical records, case management minutes, case management computer files, delivery logs of clients who delivered at the House of the Good Samaritan, Watertown, New York during the period of October 1991-May 1993:
 - a. Match all case management clients with comprehensive perinatal service clients and routine obstetrical clients.
 - b. Based on conversations with you, this would include approximately 100 clients of each type of prenatal service.
 - c. Excluded from the study would be those clients with high-risk medical conditions that are known to impact birth outcomes.
2. Confidentiality of clients will be maintained as only medical record numbers will be utilized. All files will be kept in a locked file cabinet to further provide confidentiality.

All results will be shared with you and the two agencies you represent. Also included will be information on the clients that are best served by case management and the types of services they utilize as compared to clients receiving other prenatal services. The results of this study are expected to be completed by Winter 1994.

Thank you for your time and cooperation.

Sincerely,

Donna Scheideberg, CNM

248 Market Street
Lexington, Kentucky 40507

Dr. Paul Kruger
OB-GYN Associates of Northern New York
530 Washington Street
Watertown, New York

Dear Dr. Kruger

I am a doctoral student at Michigan State University, East Lansing, Michigan. I am preparing to do my dissertation on Community-Based Comprehensive Perinatal Case Management and the impact it may have on birth outcomes and family stability. Case management clients will be matched with clients who have received comprehensive care services and standard obstetrical services. My data collection will consist of the following:

1. Review all inpatient and outpatient medical records, case management minutes, case management computer files, and delivery logs of clients who delivered at the House of the Good Samaritan, Watertown, New York during the period of October 1991-May 1993:
 - a. Match all case management clients with comprehensive perinatal service clients and routine obstetrical clients.
 - b. Based on conversations with Mrs. Linda Knight of the Maternal Health Center, House of the Good Samaritan, this would include approximately 100 case managed clients. I will match these with 100 clients who received comprehensive services and who received standard obstetrical services.
 - c. Excluded from the study would be those clients with high-risk medical conditions that are known to impact birth outcomes
2. Confidentiality of clients will be maintained as only medical record numbers will be utilized. All files will be kept in a locked file cabinet to further provide confidentiality. Also no specific health care provider will be identified, only the type of prenatal care service that was utilized by the client.

All results will be shared with you and your health care practice. The results of this study are expected to be completed by Winter 1994.

Thank you for your time and cooperation.

Sincerely,

Donna Scheideberg, CNM

248 Market Street
Lexington, Kentucky 40507

Mr. Michael Golden
Director, Medical Records
House of the Good Samaritan
830 Washington Street
Watertown, New York

Dear Mr Golden:

I am a doctoral student at Michigan State University, East Lansing, Michigan. I am preparing to do my dissertation on Community-Based Comprehensive Perinatal Case Management and the impact it may have on birth outcomes and family stability. My data collection will consist of the following:

1. Review all inpatient and outpatient medical records, case management minutes, case management computer files, and delivery logs of clients who delivered at the House of the Good Samaritan, Watertown, New York during the period of October 1991-May 1993:
 - a. Match all case management clients with comprehensive perinatal service clients and routine obstetrical clients.
 - b. Based on conversations with Mrs. Linda Knight, Director, Maternal Health Center, this would include approximately 300 clients who delivered during the period October 1991-May 1993.
 - c. Excluded from the study would be those clients with high-risk medical conditions that are known to impact birth outcomes.
2. Confidentiality of clients will be maintained as only medical record numbers will be utilized. Upon completion of data collection and computer file entry, the medical record number will be eradicated. All instruments will be kept in a locked file cabinet to further provide confidentiality. No health care provider will be identified, only the type of prenatal care service that was received.

All results will be shared with you and the House of the Good Samaritan. The results of this study are expected to be completed by Winter 1994.

Thank you for your time and cooperation.

Sincerely,

Donna Scheideberg, CNM

APPENDIX B

SUNY Health Sciences Perinatal Risk Assessment Form

SUNY Health Science Regional Perinatal Risk Assessment

A.

Initial Evaluation (____ weeks gest)

Moderate Risk Factors

Age (<17 or >35)	_____
Race (Non-White)	_____
Marital Status (Cur Unwed)	_____
Height (<5'1")	_____
Anemia	_____
Substance Abuse	_____
Smoking (>1/2 pack per day)	_____
Prior Cesarean Section	_____
DES exposure	_____
Cardiac (Class I/II or MVP)	_____
Epilepsy	_____
Infertility or chronic medical/endocrine illness	_____
Sought prenatal care >20 weeks	_____
Psychosocial risk +/- poor socio-economic conditions (see psychosocial aspects)	_____
Nutritional risk +/- or suspected poor nutrition (See nutritional aspects)	_____
Other (Specify)	_____

High Risk Factors for Poor Outcome

Diabetes (Insulin Requiring)	_____
Cardiac (Class III/IV or ARRY)	_____
Rh Sensitization	_____
Prior Neurologically Damaged Infant	_____
Prior Infant with major anomaly	_____
High Risk Factors of Low Birth Weight	_____
Uterine abnormal or Incomp cervix	_____
Prior low birth weight infant (<2500)	_____
Hypertension (>160.90 or requiring medications)	_____
Renal disease (chronic, serious)	_____
History of >2 spont Abs/TOPs	_____
Prior spont late fetal death	_____
Prior neonatal death	_____
>4 Moderate risk Factors	_____
Very High Risk for Low Birth Weight	_____
Drug addiction	_____
>2 prior low birth weight infants	_____
>2 high risk factors above	_____

B.

Overall Initial Risk Assessment

Low (no risk factors)

Moderate (1-4 moderate factors)

High (>4 moderate factors or 1-2 high factors)

Very High (1 very high factor or >2 high factors)

C.

Psychosocial Aspects

Pregnant at age <17
Emotionally unstable
History of foster care/child
abuse--self or children
History of physical/sexual
abuse
Ambivalence, negative
attitude or extreme anxiety
toward pregnancy
Social stressors in the home
resulting from poor
environmental conditions
Marital problems or
difficulties with inter-
personal relationships,
domestic violence

Poor utilization of medical care
Serious physical/cognitive
disability--self/prior child
Single parent with no emotional
or economic supports
Requested but was denied
termination of pregnancy
Considering adoption
Incarcerated mother
Poor socioeconomic conditions--
Medicaid, Public Assistance,
illegal alien, self pay
Poor parenting
Serious medical, genetic, or fetal
complications

D.

Nutritional Aspects

Pregnant at age <17
>3 pregnancies during the
past 2 years
Poor socioeconomic condition
Therapeutic diet for systemic
illness (diabetes, HTN)
Weight at first prenatal visit
<85% or >120% of standard
weight/height
Anemia (Hgb <11.0/HCT <33)

Poor dental repair
Chronic gastrointestinal disorder
Heavy smoker, drug addict, or
alcohol abuser
Food faddist, pica, or nutritionally
restrictive diet
History of anorexia/bulimia
Hyperemesis requiring
hospitalization
Inadequate weight gain or gain
>2 lbs per month

APPENDIX C

Instrument

DATA COLLECTION WORK SHEET

The instrument contained on the following pages is a compilation of instruments used to assess perinatal/family risk factors in the agencies that are part of the North Country Prenatal/Perinatal Case Management Agency, Inc. Perinatal and family outcomes, utilization of case management resources, and utilization of comprehensive care resources are the variables assessed using this instrument.

DATA COLLECTION WORK SHEET
CASE MANAGEMENT: A PANACEA FOR IMPROVED OUTCOMES ?

Instrument Number (1-3) _____

1. Medical Record Number _____
2. Age (4) _____
 - (1) 13-15
 - (2) 16-17
 - (3) 18-19
 - (4) 20-24
 - (5) 25-29
 - (6) 30-34
 - (7) 35+
3. Financial Payor (5) _____
 - (1) Self
 - (2) Medicaid
 - (3) PCAP
 - (4) CHAMPUS
 - (5) Active Duty Military
 - (6) Private Insurance
 - (7) PCAP & Private Insurance
 - (8) PCAP & CHAMPUS
 - (9) CHAMPUS & Private Insurance
4. Gravida (6) _____
 - (1) 1
 - (2) 2
 - (3) 3
 - (4) 4
 - (5) 5
 - (6) 6+
5. Parity at delivery (7) _____
 - (1) 1
 - (2) 2
 - (3) 3
 - (4) 4
 - (5) 5
 - (6) 6+
6. Father of Child Involved in Pregnancy? (8) _____
 - (1) No
 - (2) Yes
7. Marital Status (9) _____
 - (1) Single
 - (2) Married

8. Level of education (10) _____
 (1) In secondary or elementary school
 (2) Dropout
 (3) High School graduate/GED completion
 (4) Attended some college
 (5) College graduate
9. Infant one minute APGAR (11) _____
10. Infant five minute APGAR (12) _____
11. Weeks of completed gestation at birth of infant (13) _____
 (1) Below 28 weeks
 (2) 28-29 weeks
 (3) 30-31 weeks
 (4) 32-33 weeks
 (5) 34-35 weeks
 (6) 36-37 weeks
 (7) 38-39 weeks
 (8) 40-41 weeks
 (9) 42+ weeks
12. Infant Birth weight in Grams (14-17) _____
13. Type of Delivery (18) _____
 (1) Vaginal
 (2) VBAC
 (3) Vacuum
 (4) Forceps
 (5) Primary cesarean section
 (6) Repeat cesarean section
14. Type of Prenatal Care (19) _____
 (1) Standard OB
 (2) Comprehensive
 (3) Case-Managed
15. Type of Labor (20) _____
 (0) None
 (1) Spontaneous
 (2) Augmented
 (3) Induced
16. Trimester of onset of prenatal care (21) _____
 (0) None
 (1) First Trimester
 (2) Second Trimester
 (3) Third Trimester
 (9) Unknown

17. Antepartum Complications (22-23) _____
(either pregnancy or medical)
(00) None
(01) Sexually Transmitted Disease
(02) Oligohydramnios
(03) Polyhydramnios
(04) Mild PIH
(05) Severe PIH or HELLP
(06) Gestational Diabetes, non insulin
(07) Gestational Diabetes, insulin-requiring
(08) Severe Anemia
(09) Incompetent Cervix
(10) Postdates
(11) Unresolved Premature Labor
(12) Resolved Premature Labor
(13) IUGR
(14) Placenta Previa
(15) Other, not stated
18. Intrapartum Complications (24-25) _____
(either pregnancy or medical)
(00) None
(01) Malposition
(02) Abruptio Placenta
(03) Positive GBS
(04) Mild PIH
(05) Severe PIH or HELLP
(06) Fetal Anomaly (ies)
(07) Fetal Distress
(08) Shoulder Dystocia
(09) PROM
(10) RDS
(11) IUFD
(12) Postpartum Hemorrhage
(13) Nuchal Cord (or other cords)
(14) Failure to Progress/CPD
(15) Chorioamnionitis
(16) Retained Placenta
(17) Precipitous Labor or Delivery
(18) Meconium
19. Initial Infant Caretaker (26) _____
(1) Biological Parent
(2) Foster Parent
(3) Adoptive Parent

20. Case Management Agency Prenatally (27) _____
 (0) None
 (1) Maternal Health Center
 (2) Catholic Charities
 (3) Planned Parenthood
 (4) Public Health Nursing
 (5) North Country Children's Clinic/APP
 (6) Mercy Mental Health
 (7) Oswego Options
21. Case Management Agency Postpartum/Long Term (28) _____
 (0) None
 (1) Maternal Health Center
 (2) Catholic Charities
 (3) Planned Parenthood
 (4) Public Health Nursing
 (5) North Country Children's Clinic/APP
 (6) Mercy Mental Health
 (7) Oswego Options
22. Case Manager (29) _____
 (0) None
 (1) RN
 (2) ARNP/CNM
 (3) MSW
 (4) Community Health Worker
 (5) Mental Health Worker
 (6) Pregnancy Counselor
 (7) Community Service Worker
 (8) Other

23. What criteria were cited for entry into case management?
- | | | |
|--|---------|-------|
| (01) Pregnant age 17 and under | (30-31) | _____ |
| (02) Social stressors in home | (32-33) | _____ |
| (poverty, housing, finances) | (34-35) | _____ |
| (03) Poor socio-economic conditions | (36-37) | _____ |
| (M3, PA, self-pay, illegal alien) | (38-39) | _____ |
| (04) Single, no support systems | (40-41) | _____ |
| (05) Poor use of medical care | (42-43) | _____ |
| (over use, under use, | (44-45) | _____ |
| non-compliance) | | |
| (06) Poor parenting skills | | |
| (07) History of drug/alcohol abuse--resolved | | |
| (08) Alcohol/drug abuse (self/partner)--unresolved | | |
| (09) History of emotional problems/treatment--resolved | | |
| (10) Emotionally unstable (previous or current | | |
| psychiatric treatment (inpatient/outpatient)-- | | |
| unresolved | | |
| (11) History of foster care/child abuse (self/ | | |
| children)--resolved | | |
| (12) History of foster care/child abuse | | |
| (self/children)--unresolved | | |
| (13) History of physical/sexual abuse--resolved | | |
| (14) History of physical/sexual abuse--unresolved | | |
| (Note: Abuse by current significant other | | |
| should be noted under marital problem/domestic | | |
| violence) | | |
| (15) Marital problems/domestic violence | | |
| (16) Serious medical, genetic, or fetal complications | | |
| (17) Serious physical/cognitive disability | | |
| (self/partner) | | |
| (18) Incarcerated mother | | |
| (19) Ambivalence, negative or extreme anxiety re: | | |
| pregnancy | | |
| (20) Wanted an abortion | | |
| (21) Considering adoption | | |
| (22) Others, not stated | | |
| (23) Non-applicable/none | | |
24. What is the Psychosocial Risk Assessment Score? (46) _____
- | | |
|-----------------|--|
| (1) 0 | |
| (2) 1-2 | |
| (3) 3-4 | |
| (4) 5 or higher | |

25. What major categories were cited for comprehensive prenatal services?
Please rank order.

(1) Living/Housing Situation	(47) _____
(2) Parenting Needs	(48) _____
(3) Financial Status	(49) _____
(4) Educational Needs	(50) _____
(5) Employment Needs	(51) _____
(6) Health and Well-being	(52) _____
(7) Personal Development	(53) _____
(8) Age	(54) _____
(9) None or Non-Applicable	

26. Identify what specific areas under each category were identified for comprehensive prenatal services?
(Identify the top four areas of each category.)

a. Living/Housing Situation

(0) None	(55) _____
(1) Permanent Housing Needed	(56) _____
(2) Emergency Shelter Needed	(57) _____
(3) Homemaker Services	(58) _____
(4) Residential Living Services	
(5) Independent Life Skills	
(6) Emergency Food	
(7) Emergency Clothing	

b. Parenting Needs

(00) None	(59-60) _____
(01) Pediatric Health Care	(61-62) _____
(02) Breastfeeding Education and Assistance	(63-64) _____
(03) Parent to Parent Program	(65-66) _____
(04) Family Friends Program	
(05) Nurturing Program	
(06) Foster Care Services	
(07) Child Prevention/Protection Services	
(08) Adoption Services	
(09) Developmental Assessment	
(10) Adolescent Parenting Program	
(11) Resolve Paternity Issues	
(12) Custody Issues	
(13) Child Care Services	

c. Financial Needs

- (0) None (67) _____
- (1) Transportation (68) _____
- (2) Public Assistance (69) _____
- (3) Medicaid (70) _____
- (4) Food Stamps
- (5) Child Support
- (6) Advocacy to Obtain or Retain Benefits
- (7) WIC
- (8) HEAP

d. Educational Needs

- (0) None (71) _____
- (1) Tutoring (72) _____
- (2) BOCES (73) _____
- (3) Adult Education (74) _____
- (4) Child Care
- (5) GED
- (6) Transportation
- (7) Academic Counseling
- (8) Educational Advocacy
- (9) Prepared Childbirth Classes

e. Employment and Training Needs

- (0) None (75) _____
- (1) Job Placement (76) _____
- (2) Job Skill/Training (77) _____
- (3) Employment Counseling (78) _____
- (4) Child Care
- (5) Transportation

f. Health and Well-Being

- (00) None (79-80) _____
- (01) Dietitian (81-82) _____
- (02) Genetic Counseling/Testing (83-84) _____
- (03) Family Planning Services (85-86) _____
- (04) High-Risk Obstetrical Care
- (05) Alcohol/Drug Treatment or Services
- (06) Mental Health Services
- (07) Domestic Violence
- (08) Gynecological Services
- (09) Smoking
- (10) Dental Health Care
- (11) Learning Disabled

- g. Personal Development
- (0) None (87) _____
 - (1) Counseling Services (88) _____
 - (2) Establish or Identify Client Goals (89) _____
 - (3) Alcohol/Drug Counseling (90) _____
 - (4) Mentoring
 - (5) Partner Relationships
 - (6) Family Relationships
27. Total Number of Referrals/Services Initiated. (91-92) _____
28. Total Number of Referrals/Services Followed-Through by the Client (93-94) _____
29. Reasons why referrals/services were not followed through by the client.
- a. Access problem/services not available in area
 - (0) Non-applicable (95) _____
 - (1) No
 - (2) Yes - b. Crisis in clients/life prevented obtaining of services
 - (0) Non-applicable (96) _____
 - (1) No
 - (2) Yes - c. Denied services by provider
 - (0) Non-applicable (97) _____
 - (1) No
 - (2) Yes - d. Ineligible for services
 - (0) Non-applicable (98) _____
 - (1) No
 - (2) Yes - e. Provider at maximum capacity, not taking new referrals
 - (0) Non-applicable (99) _____
 - (1) No
 - (2) Yes - f. No longer applicable to client's situation (but not met)
 - (0) Non-applicable (100) _____
 - (1) No
 - (2) Yes

- g. Quit services before completion (101) _____
 (0) Non-applicable
 (1) No
 (2) Yes
- h. Unknown (102) _____
 (0) Non-applicable
 (1) No
 (2) Yes
30. Postpartum Case Management Follow-up Services (103) _____
 (0) None or non-applicable
 (1) Failed to return PP, lost to care
 (2) Discharged from Case Management Services
 (3) Refused Continuing Case Management Services, although need(s) still present
 (4) Continues Case Management Services
31. Postpartum Case Management Agency
- a. Did Case Management Agency Change? (104) _____
 (0) Non-applicable
 (1) Yes
 (2) No
- b. Postpartum Case Management Agency (105) _____
 (0) Non-applicable
 (1) Maternal Health Center
 (2) Catholic Charities
 (3) Planned Parenthood
 (4) Public Health Nursing
 (5) North Country Children's Clinic/APP
 (6) Mercy Mental Health
 (7) Oswego Options
 (8) Other
32. Family Outcomes at 6 to 9 months
- a. Client Outcomes
1. Continues with education (106) _____
 (0) Non-applicable
 (1) Yes
 (2) No
 (9) Unknown
2. Using family planning (107) _____
 (0) Non-applicable
 (1) Yes
 (2) No
 (9) Unknown

3. Has housing that meets standard living requirements. (108) _____
(0) Non-applicable
(1) Yes
(2) No
(9) Unknown
4. Continues in parenting/nurturing program (109) _____
(0) Non-applicable
(1) Yes
(2) No
(9) Unknown
5. Meeting goals as previously established (110) _____
(0) Non-applicable
(1) Yes
(2) No
(9) Unknown
6. Employed (111) _____
(0) Non-applicable
(1) Yes
(2) No
(9) Unknown
7. Having legal problems (112) _____
(0) Non-applicable
(1) Yes
(2) No
(9) Unknown
8. Requires new or ongoing Mental Health Services (113) _____
(0) Non-applicable
(1) Yes
(2) No
(9) Unknown
9. Repeat pregnancy within this time period (114) _____
(0) Non-applicable
(1) Yes
(2) No
(9) Unknown

- b. Infant Outcomes
1. Infant caretaker: (115) _____
 - (1) Infant cared for by mother
 - (2) Infant care shared with grandparents
 - (3) Infant in foster care
 - (4) Infant adopted out
 - (5) Infant death
 - (9) Unknown
 2. Father of baby participates in infant care (116) _____
 - (0) Non-applicable
 - (1) Yes
 - (2) No
 - (9) Unknown
 3. Child preventive/protective services required (117) _____
 - (0) Non-applicable
 - (1) Yes
 - (2) No
 - (9) Unknown
 4. Continues with WIC (118) _____
 - (0) Non-applicable
 - (1) Yes
 - (2) No
 - (9) Unknown
- c. Family Outcomes at 6 to 9 months
1. Stable partner relationship (119) _____
 - (0) Non-applicable
 - (1) Yes
 - (2) No
 - (9) Unknown
 2. Father of baby continues with family involvement. (120) _____
 - (0) Non-applicable
 - (1) Yes
 - (2) No
 - (9) Unknown
 3. Custody issues resolved (121) _____
 - (0) Non-applicable
 - (1) Yes
 - (2) No
 - (9) Unknown

4. Domestic Violence services
required (122) _____
(0) Non-applicable
(1) Yes
(2) No
(9) Unknown
5. Family (parents, siblings)
supportive of mother and baby (123) _____
(0) Non-applicable
(1) Yes
(2) No
(9) Unknown

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BIBLIOGRAPHY

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