INTERCONCEPTION HEALTH PROMOTION INITIATIVE
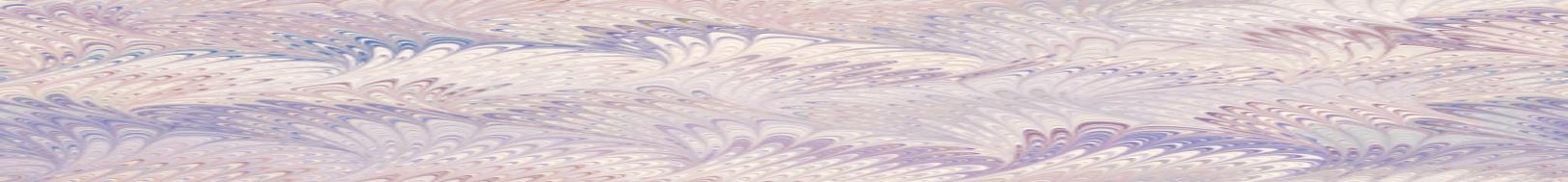
FINAL REPORT

June 9, 2003

funded by

INTERCONCEPTION HEALTH PROMOTION INITIATIVE

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June 9, 2003

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University of Colorado

The Interconception Health Promotion Initiative

Presented to:

The Colorado Trust

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SUMMARY

SUMMARY

The Interconception Health Promotion Initiative was a demonstration project, funded by The Colorado Trust, which was developed at Denver Health from 1995 to 2001.

The objective of the initiative was to develop a home-based case management program for women who had had a low birthweight baby, a fetal demise, or a baby with congenital anomalies, and who planned on having more children, with the goal of improving outcomes of future pregnancies.

Rationale

The single greatest predictor of low birthweight or prematurity is the previous birth of a low birthweight baby. Women who have had one preterm delivery or a small for gestational age baby have a 2 to 12 times increased risk of a subsequent poor outcome compared to women without such a history.

Although prematurity and low birthweight are multifactorial problems, many of the causes are present before conception. The interconception period may be an optimal time to intervene in high risk women. Because the case management approach offers an opportunity to individualize interventions to client needs, it was selected as the framework for IHPI.

Program

Patients were recruited at the time of the delivery of a qualifying infant and received a comprehensive evaluation, and then intensive, relationship-based home visitation services which focused on a variety of domains, including maternal role, follow-up of medical and reproductive health issues, contraception, and life course. The women were followed for up to three years, or though a subsequent pregnancy.

Results

A substantial majority (about 75%) of new mothers with the specific problems that were targeted by IHPI were eligible for the program. Of those eligible for the program, about half (46%) were contacted by the program regarding the IHPI services. Those contacted tended to be women who were at higher risk for future poor pregnancy outcomes. Of the women who were contacted by the program, a little more than half (55%) agreed to participate. In short, about one out of five (21%) of the women who were eligible to participate in the IHPI program actually participated in it.

By far, the most important factor in determining IHPI participation was having face-to-face contact between the mother and an IHPI case manager. This was especially true for women who were born in the USA, and also for women with fewer negative pregnancy experiences and outcomes (either in this birth or in previous pregnancies).

During the early stages of program involvement, the clients stayed in close contact with the case managers, but this level of contact decreased over time. Most of the time was spent in the areas of Maternal Role, Personal Health, and Family Planning, with substantial variation over time and from woman to woman based on the risk level of the client at intake.

Changes in the risk levels of program participants during the program appeared to depend considerably on the nature of the risks, as some risks are changeable, while others are not. Change in risk scores during the program was difficult to assess but appeared to decline for the clients with the greatest risk level.

Compared to qualified women who declined the program, women who participated were more likely to follow through on their post-partum care and birth control use after the index birth. In addition, they had a longer interconception period than the women who declined to participate. Finally, their subsequent babies were:

- heavier
- less likely to be low birthweight
- less likely to require a stay in the NICU

In fact, the longer the interconception period, and the longer the time in the program, the more pronounced the differences in birthweight were.

Discussion

But were these improvements due to the IHPI program? This is the main unanswered question. Although a comparison group (of those who chose not to participate in the program) was employed, it is difficult to determine if any changes are due to the program or to pre-existing differences between the two groups of women before their IHPI program involvement. The one drawback to comparing the IHPI Completers to those who chose not to participate in the program is that they are quite different, in many ways, from the very beginning. Without a randomized control group we cannot be sure of the program's

effect on future birth outcomes -- even though the results reported here look very promising.

In summary, these results suggest that women who participate in a comprehensive home visitation and case management program after a poor outcome birth have higher rates of compliance with post-partum care and family planning. They seem have longer interconception intervals and better outcomes as measured by NICU admission and cumulative low birthweight rates. Data from linked birth certificate studies have demonstrated that there is a high risk of repeat prematurity among women who have a gestation of under 32 weeks (relative risks of 6 - 12). Therefore, even though there is no control group, the fact that the program participants had no babies small enough to need NICU admission may be significant.

There are some limitations to this analysis. The follow-up data were obtained by a prospective chart review at only one institution, Denver Health, and may have underestimated subsequent pregnancies. In addition, there are clearly differences between the population of women who chose to participate in the program and those that do not. However, the results are encouraging.

Implications

Virtually all of the women in the study population were either uninsured or covered by Medicaid only for pregnancy and the delivery. This coverage typically ends at two months after delivery. As a result these high risk women have significant barriers to obtaining either further evaluation and treatment of the problems that may have contributed to the poor outcomes, or effective reproductive health care and contraception which may be able to prevent
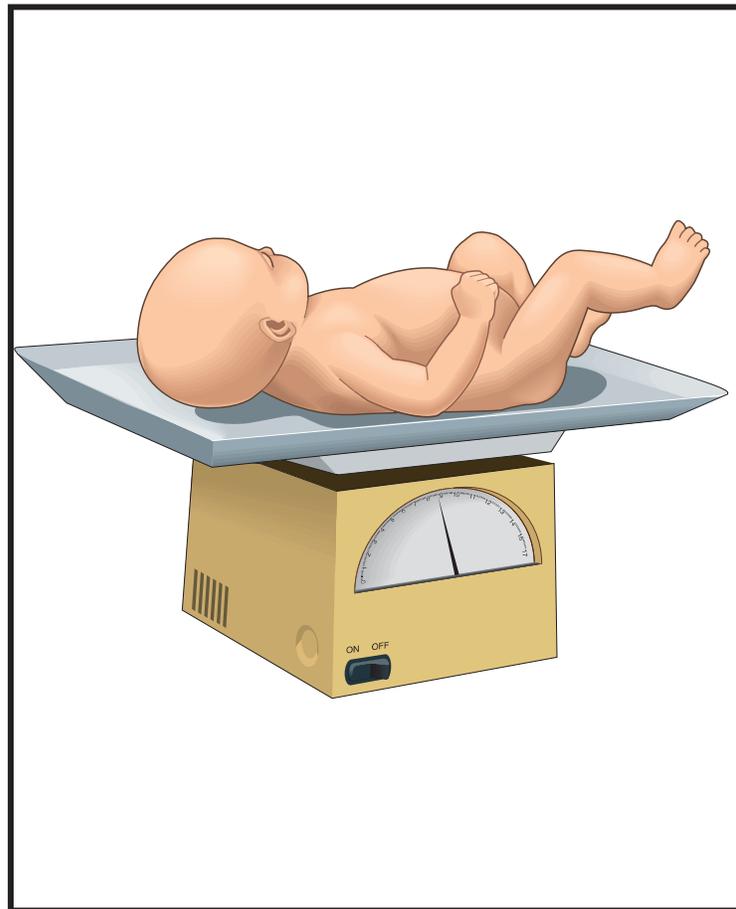
an early repeat pregnancy. A case can be made that the provision of interconceptional case management and medical care to targeted high risk women may be effective in preventing the human and societal costs of repeated poor pregnancy outcomes.

FOREWORD

FOREWORD

In 1993, The Colorado trust issued a request for proposals for an Interconception Health Promotion Initiative, "to serve families who have experienced a poor pregnancy outcome to optimize the outcomes of any future pregnancies that are desired." This initiative was related to the Colorado Trust's goals to strengthen families, and was part of a two-stage effort to reduce risks that can lead to an unhealthy child. The first stage of the initiative was the Preconception Health Promotion Initiative, which had been started the year before.

The Colorado Trust developed these initiatives because of concerns about lack of progress in improving pregnancy outcomes in Colorado in the previous decade. Because traditional approaches which focus on prenatal care had had limited benefits in improving birth outcomes, the Colorado Trust was interested in studying approaches which would allow identification of risk factors and improving women's health before conception. The Preconception Initiative's goal was to reduce risks in women planning their first child. However, many of the women at highest risk for poor pregnancy outcomes do not present for care at all or until well into the pregnancy. Thus the interconception approach was felt to be a good opportunity to provide families with early, preventive care. Clients with risk factors can be identified after the completion of their pregnancy and targeted for long-term follow-up to reduce and eliminate these risks.

The original objectives of the proposal were to:

- Identify women for enrollment who have experienced a recent poor pregnancy outcome and who desire future pregnancies

- Link affected families to appropriate local and regional services through regional case management systems following a comprehensive assessment of needs

- Reduce and eliminate existing risks (medical, nutritional, psychosocial and behavioral) over a period of two years through multi-disciplinary and culturally relevant education, counseling, referral and follow-up (including tracking of family planning appointments), prior to the onset of another pregnancy.

The target population of women with poor pregnancy outcomes was defined as those who had 1) delivered a low birthweight baby or 2) those who had delivered a child with congenital, structural or chromosomal defects or anomalies.

The original model was to fund regional coordinators, to identify potential clients, and use decentralized case managers to work with the clients, using a case management model developed by the Trust. This case management model consisted of completion of a comprehensive medical, nutritional, psychosocial and lifestyle risk assessment, development of a care plan for risk reduction, and implementation of interventions for each risk factor, including referral to appropriate resources, (including medical and family planning services), reinforcement of teaching and counseling, and follow-up for up to two years to monitor

progress. The grant included funds to reduce barriers to medical services for uninsured patients.

A team from Denver Health and hospitals applied for the grant in early 1994. Denver Health (then called Denver Health and Hospitals) is a vertically integrated safety net health care system, including a 349 bed public hospital and a network of 13 affiliated community health centers which provide prenatal care to the majority of Denver's low income pregnant women. The hospital delivers over 3,000 babies a year and had at the time a low birthweight rate of over 10%. The team who applied for the grant all had experiences with high risk women who returned for repeated complicated pregnancies, with poor outcomes, yet had little care in the interconception period. This multi-disciplinary team consisted of members of the departments of Obstetrics, Family Medicine, Neonatology, Social Work, Nursing, and Nutrition. This team continued on as a steering committee during the start-up phase of the project, and then continued in a consulting role in evaluating difficult clients.

Denver Health was awarded the grant in 1994, and was the sole site funded. Because there was only a single site funded, the scope of the proposal was narrowed somewhat to developing the case management model within a single community. David Olds, Ph.D., was hired to assist with the development of the case management model and the initial evaluation. The coordinator was hired in 1995, and the first year was devoted to hiring the staff and developing the model, procedures and policies. The first clients were enrolled in 1996. In 1997, the Department of Family Medicine at the University of Colorado Health Sciences Center took over the evaluation.

This report includes a description of the case management model that was developed by IHPI, description of real-life stories of our clients, many lessons learned and results of our experiences with the clients we worked with in the first three years, including follow-up results and outcomes of future pregnancies.

The program also helped to stimulate the development of a number of other case management programs at Denver Health, including the Community Voices program (Co-funded by the Kellogg foundation and the Colorado Trust) and the Denver Best Babies program, a comprehensive home visitation program for high risk pregnant women, which has also incorporated the Interconception Health Promotion model.

THE PROBLEM
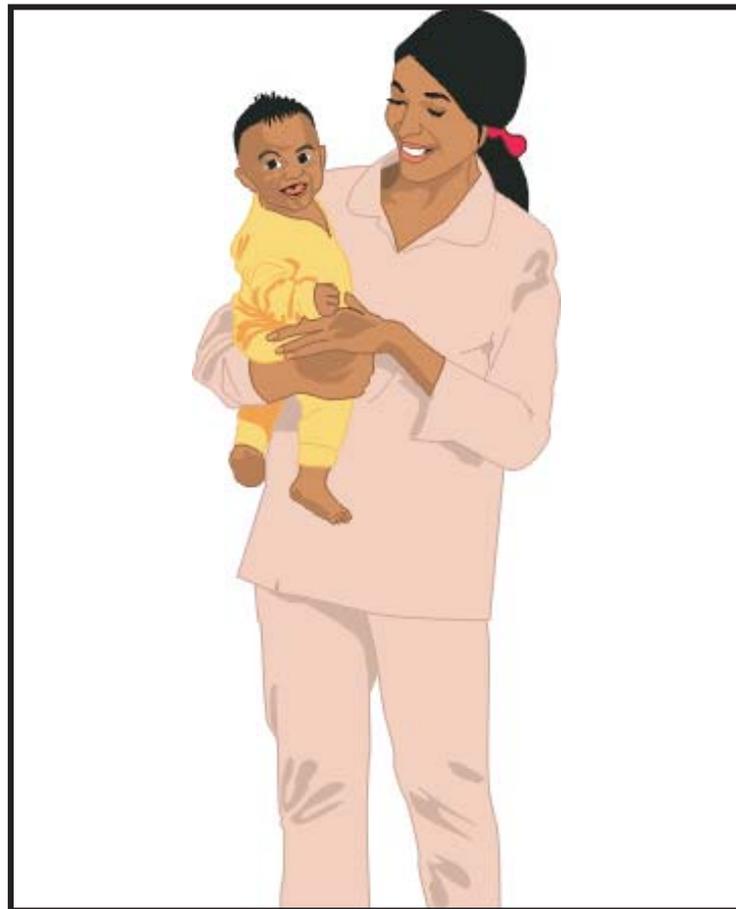
THE PROBLEM

High rates of low birthweight deliveries and infant mortality are persistent public health problems for the United States, which ranks twenty-first among all nations in infant mortality[1]. Although improvements in neonatal care have increased infant survival, there has been little improvement in rates of low birthweight and preterm births in the past 20 years. In fact, there has been an increase in preterm births in the past five years [2,3] due in part to wider availability of fertility treatments and resultant multiple births. Equally disturbing is the persistent disparity in low-income and minority communities, where the rates of prematurity and low birthweight are twice the national average[3]. These rates of prematurity and low birthweight have endured, despite implementation of a wide range of different preventive strategies, including: improved access to or enhancement of antepartum care, risk assessment for early identification and treatment of preterm labor (PTL), and case management or care coordination to decrease unhealthy behavior and increase social support. For example, in several states Medicaid expansions failed to demonstrate any resulting improvement in outcomes.

Lack of prenatal care may be as much a symptom of a woman's poor health status as a cause of the poor outcome. In recognition of the fact that the factors contributing to poor maternal outcomes are multifactorial, there has been a great deal of interest in, and increasing public support for case management programs, which provide additional support and care coordination for high risk families. There have been numerous such programs implemented across the country in the last decade. Common themes among successful programs are interventions that are individualized to the specific modifiable risks and needs of the client (or target population), and ongoing personal contact with a case worker.

A significant challenge in any program that attempts to improve maternal health, whether it is physical or psycho-social, is that the span of the pregnancy is relatively short in comparison to the effects of a lifetime of stress and poor lifestyle. This is exacerbated by the fact that the pregnancy itself is often an additional crisis on top of ongoing stress. To the extent that low birthweight is a symptom of years of poor health practices and stress, or low socioeconomic status, even the most comprehensive antepartum programs will have limited success.

Poor health prior to pregnancy, or in the early stages of pregnancy, contributes to the chain of events that increases risk of poor outcomes. For example, there is evidence that certain vaginal infections colonize the endometrium, and, if present prior to conception, may lead to an increased risk of preterm labor (PTL)[3]. Other well accepted preconception risk factors include nutritional deficiencies such as folic acid, medical problems such as hypertension or poorly controlled diabetes, and obstetrical problems such as a uterine anomaly or incompetent cervix, all of which have been associated with prematurity. Short interconception intervals and unplanned pregnancies have also been demonstrated to increase the risk for poor outcomes[4,5]. Once a woman is pregnant, it may be too late for

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even the most comprehensive prenatal care programs to prevent or ameliorate the effects of such preconception risk factors.

These arguments make a strong case for the importance of preconception care; however, there is little evidence in the literature of effectiveness of providing preconception care on pregnancy outcomes. In addition, the rates of unplanned pregnancy are high throughout the US, especially in those populations with the highest rates of poor outcomes[6]. Preconception care will only reach a small set of women, and probably those who are most motivated and compliant to start with.

In most populations, the single greatest predictor of preterm birth is a prior preterm birth[7]. Women who have had one preterm delivery, or a small for gestational age (SGA) baby, have two to 12 times the risk of a subsequent poor outcome, compared to women without that history[8,9,10]. Many women who have had poor outcomes remain at risk for an unplanned pregnancy and will have poor outcomes in future pregnancies. Unfortunately, access to ongoing medical care or case management often dries up after the immediate post-partum period, once a woman's Medicaid eligibility is lost. As a result, many high-risk women may not have their medical and contraceptive needs addressed adequately after delivery, and thus remain at risk for another too early, high- risk pregnancy.

Many of a woman's social and medical problems, which are known to contribute to a poor birth outcome, do not disappear once the baby is born. Issues that may persist include: unresolved medical and obstetrical problems, contraception, high-risk behaviors (unsafe sex, substance abuse, persistent or recurrent STDs), psychosocial problems, and legal problems (e.g. incarceration or placement of the child into the custody of Social Services). Many of these problems may be amenable to change. For example, the birth of a child, especially a sick child, may make a woman more receptive to changes in behavior and lifestyle than at any other times in her life-cycle. Therefore birth is an ideal time and opportunity to identify high-risk women and attempt to provide preventive interventions that have the potential to reduce prematurity and other poor reproductive outcomes in subsequent pregnancies.

Although there are numerous case management and home visitation programs that address the ongoing needs and family support issues for low birthweight, high-risk infants during the first few years of life, there are relatively few, if any, which focus on reducing the mother's risk of additional high-risk pregnancies. Among those studies that have also followed maternal outcomes, there has been evidence that continued services after delivery have resulted in increased intervals to subsequent pregnancies and improved compliance with contraception[11].

In recognition of the potential benefit of services for high risk women during the interconceptional period, Denver Health received support starting in 1996 from The Colorado Trust to initiate a demonstration project of interconceptional case management and home visitation for high risk mothers. The program goal is to reduce high-risk behavior and other risk factors in a population of women who have already had a poor pregnancy outcome and to improve outcomes of subsequent pregnancies.

THE PROGRAM

THE PROGRAM

IHPI Home Visitation Philosophy, Training, and Activities

Introduction

As described in the Foreword, the Colorado Trust initially proposed The Interconception Health Promotion Initiative as part of a comprehensive approach to improve prenatal outcomes in the State of Colorado. The concept of IHPI was to identify women who had proved themselves most at risk by virtue of a poor birth outcome, and provide them with comprehensive evaluation and case management with the hope of improving future pregnancy outcomes. Because of the high rates of low birthweight (LBW) deliveries, Denver Health sought the funding. In 1994, the Colorado Trust funded a demonstration project at Denver Health and the first cases were enrolled in the program at the end of 1995.

Goals

IHPI targeted socially vulnerable women who, after the delivery of a high-risk infant (primarily low birthweight or fetal demise) remain at risk for future poor pregnancy outcomes. The program used a home visitation model to provide case management and social support during the immediate postpartum and interconception periods. The objective was to improve the outcome of future pregnancies by:

- facilitating access to available health services, such as medical care and contraception, which this population typically does not access,
- promoting a healthy lifestyle and risk reduction,
- supporting clients in developing their maternal and life roles.

Development of the Case Management model

In the early stages of the IHPI, the staff worked closely with David Olds, PhD, developer of the Nurse Family Partnership program, Sally Beatty, RN, of the Colorado Trust, and Karen Treweiler, MS, CNM, of the Colorado Department of Public Health and Environment to develop the case management model. In recognition of the relevance of both medical and psychosocial issues in the lives of the target population, both nurses and social workers were used as case managers. From these beginnings, the model further evolved in direct response to the experiences of the case managers in the field in the first year of the program.

The program used a home visitation model of case management. The case managers focused on:

- reduction or resolution of medical, nutritional, psychosocial and behavioral risks before conception of another pregnancy,
- improving compliance with postpartum care,
- education regarding preconception and prenatal care in the event of a subsequent pregnancy.

The case management strategy was to promote healthy behaviors through increasing the participants' internal resilience, knowledge and skills, so that they could effectively use available resources to improve their own and their family's well-being. The case managers used a culturally relevant, client-centered, strengths-based approach to provide individualized education in seven major domains: Medical/Obstetrical, Family Planning, Lifestyle, Relationship Issues, Life Necessities, Maternal Role/Issues with the baby, and Life Course. Included in the domains are health and preventive care in the reproductive years (including sexually transmitted infections, family planning, specific medical conditions, preconception care, prenatal care, nutrition, exercise and stress), effective use of the health care system, early child development and parent-child attachment; improving relationships, job training, education, work, smoking, drug and alcohol cessation; development of self-esteem, coping skills, problem solving, decision making and communication skills, anger management and assertiveness training. In order to gain the confidence of the clients, and improve their ability to focus on the health and self improvement, the case managers also assisted with referrals for basic needs (housing, food, clothing) and substance abuse treatment as indicated.

Patient Population and Recruitment

Potential participants in IHPI were recruited from the population of women who delivered at Denver Health Medical Center (DHMC) or received prenatal care at one of the Denver Health affiliated Community Health Centers. The majority of the participants were identified through direct outreach at Denver Health Medical Center at the time of delivery of a low birthweight baby or a fetal demise. Women delivering at other hospitals but receiving follow-up care with Denver Health were also eligible.

Case Identification

The case managers reviewed the delivery logs regularly, attended rounds on the obstetrical and neonatal units, and maintained regular communication with nursing and social work staff in the nursery, neonatal intensive care unit, postpartum ward and the managed care case managers. The woman's risk level and eligibility were initially assessed through medical chart review, communication with hospital and clinic staff and interviews with the potential client. When possible, potential clients were contacted prior to their (or their baby's) discharge from the hospital. If that was not possible, potential clients were contacted for a face-to-face visit as soon as possible. Otherwise, recruitment was attempted through phone calls, letters and "drop-by" visits.

Eligibility criteria

Clients who had delivered a low birthweight baby or a baby with congenital defects or had a fetal demise were eligible for the program. Women who had twins, were incarcerated, did not speak English or Spanish or who had a post-partum tubal ligation were excluded. In the first 6 months of the program, nearly all women meeting these criteria were actively recruited. However, the number of eligible patients rapidly exceeded the capacity of the program. Once the case loads were nearly filled, the case managers were more selective in their recruitment, targeting

clients who were at greatest risk for future poor outcomes. (There is a complete description of the eligibility criteria in the Appendix on page 126.)

Client Assessment and Enrollment

During the initial contacts, the case manager explained the program, determined the woman's interest, answered any questions and, if she was receptive to the services, enrolled her by completing the consent form, the client rights form and the enrollment form (see the Appendix on page 132). The case manager also requested permission to contact family or friends, if necessary, to provide information on how to locate the woman after hospital discharge. Throughout the process the case manager stressed the importance of the client's participation in making plans, setting goals and all other activities. For research purposes, baseline demographic data was collected on all patients who were approached by the program, not just the enrollees.

Once a client had agreed to participate in the program, a comprehensive assessment and initial plan (or Intake form) was performed (see the sample Intake form in the Appendix on page 138).

Each intake often took two or three visits to complete. These appointments were generally in the client's home, and were key in the initial development of a relationship with the client. During the intake process, the case managers also provided assistance with client's immediate needs for medical follow-up and/or enabling services such as Medicaid referral or financial support, transportation or housing. These services were often provided before the initial assessment was complete, and assisted in engaging the clients in the program.

Case managers also obtained client consent to contact other agencies and case managers with which they were currently involved to enhance collaboration and client advocacy. This was necessary to avoid duplication of services, and to clarify which agency would provide which service.

By the end of the intake process, the case manager and client reviewed the assessment and together developed an individualized intervention plan which included:

• A list of client strengths, health and social risk factors and her prioritization of the issues.

• Goals that are within reasonable reach for the client and the program. (Common examples were an increase in the client's knowledge, access to resources, or movement along the Readiness-to-Change scale.)

• Documentation of the needed information, services, resources, and mode of "service delivery" (advocacy, support, teaching, coaching, counseling, referral, etc.) to reach the agreed upon goals.

The case managers enrolled a maximum of two or three clients a week until reaching a maximum caseload. A high frequency of visits/contacts was necessary in the first four to six weeks to complete the assessment, facilitate medical care in the post-partum period, assist with any immediate crises, and developing a positive working relationship with each woman. Eventually caseloads varied between 25 and 35 clients depending upon the acuity of the

woman and infant situations, the mothers' level of empowerment in needed activities and the resources available in the community.

Case Management Model Strategies For Engaging the Client

One of the key tasks of the intake and first few visits was to engage the client, and form a bond with her. This process required a great deal of flexibility on the part of the case manager to stay on task with the assessment process and be able to assist in more immediate crises in the client's life. The desired result was development of a trusting relationship on which to build the rest of the intervention. Although the strategies varied across clients, common elements included the ability to listen to the clients' stories, and to understand their priorities. Providing assistance with crises helped establish trust.

Goal Identification

Case managers assisted the clients to develop goals that could be reached within the time-frame for the woman's involvement in the program, considering the strengths, resources and deficits to be dealt with. In many cases the goal was defined as reducing barriers to client growth so that she was enabled to accomplish her longer-term goals independently, or where appropriate, with assistance from other agencies, programs or sources of support.

There was often divergence between the overarching program objectives and initial client goals. For example, from the client's viewpoint, getting follow-up medical care may be a low priority, while the home visitor feels it is imperative that she be seen. This tension would be resolved by referring back to the general program

goals of health promotion and using the Prochaska & DiClemente stages of change framework, with the aim of going one step at a time. As the working relationship developed, the home visitor worked to assist the client in incorporating and "owning" the program goals.

Although every case was unique, the case managers found common strategies. It was necessary to start "where the client is" in intervention. Generally, they first dealt with immediate life necessities, then the obstetrical and medical follow-up needs, and eventually moved into the educational and longer-term goals related to possible causes and prevention of factors responsible for high risk pregnancies and the fragile child. The medical needs were usually apparent to the client. They were often interested in the cause of their poor pregnancy outcome, and thus very receptive to education about their reproductive health risks or the infant's health problems. Therefore, a common goal for all clients was to provide each woman with the information needed to better understand the contributing factors, obtain needed medical care for herself and her infant, and develop a plan to improve her chances for a better pregnancy outcome in the future.

This approach logically led to developing objectives for pregnancy care or for family planning that flow naturally out of the client's personal agenda. It also avoided the potentially alienating and disempowering effects of a home visitor attempting to monitor a woman's personal habits or her use of birth control. This is a particularly sensitive issue for minority women who may believe that the "system" has the agenda of keeping minority women from reproducing. For this reason we were very careful to inquire after, and to respect each woman's desire for another child and

her thoughts about the timing of her pregnancy. The care plan always included preparation and planning for a healthier next pregnancy, rather than preventing pregnancy, unless that is the woman's stated wish.

As case managers and clients moved beyond initial medical care, they were able to bring in appropriate goals related to other Domains.

Goals in the Seven Domains

Although setting goals and intervention plans was client-centered, the case managers organized their interventions and education into seven major Domains. Work in these areas was recorded in the visit encounter documentation, and the plans of care and goals were sorted into seven Domains or categories:

- Medical/Obstetrical,
- Family Planning,
- Lifestyle,
- Relationship Issues,
- Life Necessities,
- Maternal Role/Issues with baby, and
- Life Course.

The case manager also recorded the amount of time that was spent with each client in each Domain during each encounter (see page 157 in the Appendix for an example of the Encounter Form).

Interventions: Client-Centered and Solution-Focused

The overarching philosophy of the intervention was to focus on solutions rather than problems. This is key in working with women who may feel overwhelmed by their problems and poor support systems. This "solution-focus" helps in re-framing the client's situation, which can be a powerful intervention in itself, by promoting an increased sense of self-efficacy.

Priorities for intervention were flexible to allow for intermittent crises. Often, the case managers immediately focused on survival-level issues such as food, shelter, and safety. The time period of engagement work which preceded the formal care plan was focused on these issues and on similar efforts to reorganize and stabilize the family situation after the crisis of the poor birth outcome. As the woman's life stabilized, her energy and attention became available for health and life-style change issues. In general, the case managers found that they emphasized different Domains as the relationship developed. Following are descriptions of the seven Domains and typical intervention strategies pertinent to each.

Medical/Obstetrical

This Domain includes all issues which would come to medical attention or need evaluation by any health professional including nutrition, physical therapy, psychiatry, etc.

Typical Problems	Typical Goals	Typical Intervention Components
• *Inadequate or lack of prenatal care, lack of compliance with prescribed actions.* • *Complications of pregnancy, such as:* *-- pre-term labor,* *-- incompetent cervix,* *-- pre-eclampsia,* *-- chronic hypertension,* *-- sexually transmitted infections,* *-- group B strep infection,* *-- premature rupture of membrane (PROM),* *-- anemia,* *-- malnutrition.* • *Fetal abnormalities, history of spontaneous abortions.* • *Other health problems.*	• *To increase the client's knowledge of her physical problem, anatomy and physiology of pregnancy, signs and symptoms of problems, knowledge of pertinent wellness and prevention practices.* • *Client will move from precontemplation into the contemplation or planning phase of change regarding her health risk factors.* • *To facilitate timely prenatal or postpartum care, other medical follow-up and preconception care in the future.* • *To address issues of finances and insurance where necessary for obtaining medical care.*	• *Counselor will provide information and education.* • *Counselor will facilitate follow-up with care providers.* • *"Intensive" referral to financial case manager, Medicaid or other agencies.* • *Counselor will model problem-solving and counseling regarding transportation, child care, and other barriers.*

Family Planning Goals

This Domain includes all issues relating to reproduction. Some health conditions will overlap with the previous medical category, such as cervical incompetence, and may be placed in one or both Domains but should be included in family planning goals if there needs to be consideration of high risk in a future pregnancy.

Typical Problems	Typical Goals	Typical Intervention Components
• *Lack of knowledge of reproductive health and female physiology, "denial" of risk.* • *Never used birth control, contraceptive failure, short interconception interval, undesired fertility, mistaken beliefs about conception, lack of resources to obtain contraceptive/family planning, fear of medical system.* • *Lack of adequate social support.*	• *The client will have a family planning plan and the means and knowledge to implement it.* • *Client will understand factors leading to healthy pregnancy.* • *The client will understand the reproductive cycle.* • *The client will obtain desired contraception.* • *Client will have explored possible sources of social support.*	• *The home visitor will provide education.* • *The home visitor will facilitate making and attending clinic appointments.* • *The home visitor will provide reflective counseling regarding sexuality, relationships, family planning and social supports.*

Lifestyle Issues (Behavior)

This includes cigarette smoking, drug use, risky behaviors such as unsafe sex, and any habit or practice that undermines health significantly.

Typical Problems	Typical Goals	Typical Intervention Components
• *Positive drug screen.* • *History of substance use/abuse.* • *Cigarette smoking.* • *Unsafe sex.* • *Multiple partners.* • *Involvement with legal system.* • *Problems with unhealthy eating habits or poor fitness.*	• *The client will understand the health risks of her behaviors, the effects upon pregnancy, and the effects upon relationships.* • *Develop an action plan to diminish risks or to decrease or cease risky behavior.* • *Understand stages of change and have a relapse plan.* • *Move from precontemplation to contemplation stage regarding risky behavior.* • *Have knowledge of and access to treatment and support.* • *There may be specific objectives such as moving to a healthier social environment. The goal is to comply with Department of Social Services or any legal case-plan.*	• *Facilitated referral and support to engage in any treatment program.* • *The case manager will support the client in following through with Department of Social Services prescribed treatment plan or other treatment as needed.* • *The case manager will:* *-- provide education on health risk at appropriate "Prochaska stage."* *-- refer to clinic and community resources for treatment and support programs.* *-- teach conflict resolution and problem-solving skills to reduce client's stress and improve coping.* • *Promote recognition of personal strengths, validate efforts and healthy factors in life, promote self-efficacy and self-esteem when opportunities arise.*

Relationship Issues

This includes all partners, family, friends, ex-partner issues and sources of emotional support or distress and pragmatic help or drains upon her resources and energy.

Typical Problems	Typical Goals	Typical Intervention Components
• *Lack of supportive relationships, family conflict, relationship conflict, abandonment by the father of child or family, domestic violence, etc.*	• *The client will move to determination/preparation for action stage (or other stage as appropriate.)* • *The children will be safe.* • *Client will be connected with an ongoing source of support.*	• *Provide intensive referral to counseling.* • *Impart knowledge of the cycle of violence and resources in community such as shelters and counseling.* • *Educate/facilitate use of legal resources.* • *Provide education and supportive counseling.* • *Teach communication and problem-solving skills.*

Life Necessities Issues

This includes immediate survival needs, income or lack of income issues, adequacy of current food, shelter, transportation, furniture, clothing, etc.

Typical Problems	Typical Goals	Typical Intervention Components
• *The client is unable to maintain adequate food, shelter, transportation or child care.* • *Homelessness and near homelessness.* • *Chronic, chaotic lifestyle.*	• *The client will have knowledge of resources and have a realistic action plan to meet needs.* • *The client will be connected with community agencies appropriate to need.* • *The client will know how to access Department of Social Services and other agencies.*	• *The degree and kind of intervention will vary according to individual challenges. The woman may have barriers related to status as a minor or to being undocumented, she may have learning disabilities or emotional/mental problems. She may have lost support of the father of the child or family or have circumstances preventing her access to social services, etc.* • *Provision of temporary transportation help in cab vouchers and bus tokens.* • *The home visitor will provide resource referral, advocacy, facilitate follow-up on referrals as needed.*

Maternal/ Child issues

This Domain includes all issues regarding her children, their needs, the parent/child relationship, developmental concerns and so forth.

Typical Problems	Typical Goals	Typical Intervention Components
• *First time parent.* • *Lack of support.* • *Lack of knowledge of child care/development.* • *Maternal history of abuse/neglect.* • *High-risk child due to prematurity, developmental delay, or congenital anomaly.*	• *Increase knowledge and skills for child care and developmental understanding.* • *Client will hold baby and make face-to-face contact while bottle feeding.* • *The father of the child will learn parenting skills.* • *Supported referral to child care resources and counseling to increase client receptivity to use of child care.* • *Child welfare will be monitored and parents will understand case manager's role as their advocate and the child's advocate regarding Child Protective Services.*	• *Counselor-to-client education and supportive counseling, modeling, coaching, etc.* • *PIPE Program in home to enhance mother-child relationship.* • *Referral to parenting programs, support groups, parent aid program, etc.* • *Referral to children and families special needs program.* • *Assistance with Social Security or other financial and support programs.*

Life Course Issues

This category includes issues of education, training, employment and future goals such as leaving parent's home, owning a home, English as a Second Language classes, or gaining citizenship.

Typical Problems	Typical Goals	Typical Intervention Components
• *Interrupted education.* • *Lack of adequate income.* • *Lack of job skills.* • *Lack of training opportunities.* • *Language barriers.*	• *Client will gain knowledge of educational /training programs, understand how to access them and have a reasonable plan for implementation.*	• *Provision of information and clarification of how to effectively use the system, problem-solving discussion, modeling how to explore for financial support, anticipate obstacles and plan to resolve them.* • *Referral to community agencies and resources.*

The program had no set curriculum, time line, or list of goals and objectives for all clients. As a result, individual client goals varied depending on their risk, self assessment, social situation and readiness to change their health and future childbearing. However, there were a number of essential goals regarding health that were incorporated for all clients throughout the program. The case managers used "teachable moments" to introduce these goals. In practice, we developed the following common goals for all clients:

- To improve the understanding of their specific pregnancy and health-related risk factors, strategies to change or ameliorate those factors, and to share this knowledge with others in their communities.

- To advocate and facilitate access to appropriate medical care, including post-partum and infant health care, family planning; to promote early and adequate preconception and pre-natal care; and to promote ongoing use of healthcare and community services for mother, child, and family.

- To promote family planning in a culturally-appropriate manner for either conception or contraception as a choice within each woman's control and to facilitate her access to services needed to do so.

- To foster awareness of health behavior risks in a manner that supports and facilitates the client in advancing along the "change continuum" to a healthier lifestyle.

- To enhance the parent child bond and increase knowledge and skills enabling optimum child development for each family.

- To communicate respect for each woman through maintaining clinical and cultural sensitivity in the delivery of our message and a client-centered focus in any and all intervention efforts.

Case Management Strategies

The Interdisciplinary Case Management Model and the Strengths of Differing Perspectives

Given the program's overall objective of optimizing the outcome of current and future pregnancies, and the breadth and depth of the health and social issues involved, we found that an interdisciplinary approach was necessary. The program employed an even mix of social workers (MSW and LCSW are required) and nurses (BSN and RN are required) as health promotion counselors/case managers. Both professions have similar foundations:

- Both fields of study are embedded in the social sciences,

- Both use a knowledge base including systems concepts, theories about stress and coping, developmental psychology, and psychosocial intervention techniques,

- Both are committed to holistic care, and

- Both have strong commitments to promoting human health and well-being.

Traditionally, nurses and social workers provide services to the same individuals and families, addressing the same problems from their differing perspectives. In some settings, this had led to "turf issues" or "profession-centered",

rather than client-centered, services. This can result in a dilution of the client-caregiver relationship. Many of the women in the program had not successfully responded to traditional practice and programs. It was key to the success of the program that the home visitors set aside professional agendas, focus on developing a therapeutic relationship, and engage the client "where she was". While the individual counselor formed a one-to-one relationship with each of her clients, the RN or LCSW colleagues served as a primary resource in the promotion of both psychosocial and physical health.

As the relationship developed, the case managers also sought to improve the client's self-efficacy. We observed great benefit to clients in providing a highly trained professional who is also addressing areas which are not within the expert's particular expertise. This approach is supported by extensive research in the psychology of self-efficacy development, which demonstrates that too great a distance between the learner and the mentor/counselor inhibits modeling and development of self-efficacy[12].

When the case manager is not being "the total expert", the "know it all", she can be authentically able to empathize with the client's uncertainty, frustration, or lack of knowledge and thus form a partnership in overcoming the obstacles. The counselor demonstrated self-efficacy in confidently and comfortably owning her lack of knowledge and willingness to use other "resources" (her RN or MSW colleague, the doctor or clinic etc.), thereby modeling problem-solving strategies. This complemented many other leveling and empowering features of the program, such as the home visits, in which women were the experts and the health promotion counselor

became the learner regarding the family's culture, goals and needs. In this manner, a health promoting partnership was established between the woman and the counselor in actuality, not just in theory.

In addition, as counselors shared ideas from their respective areas of expertise, "cross-pollination" occurred between professions, increasing each one's perinatal competencies and ability to function with greater ease in the many ambiguities surrounding the causes and prevention of poor pregnancy outcomes and in promoting behavior change.

Health Realization Strategy

The case management strategy incorporated several key elements:

1. The development of a relationship through which the home visitor partners with the client to support and promote the client's ability to problem-solve and promote the well-being of herself and her family.

2. The approach involves assisting clients and their families to manage their current situations while empowering them to competently manage situations in the future.

3. Through the dynamic interaction of the relationship, a participant is mentored to effectively use available resources and improve well-being for herself and her family despite environmental or personal obstacles.

4. As the relationship develops, the case-managers use client-centered, strengths-based approaches as they facilitate "teachable moments" to provide education around health and preventive health care,

provide support and education for child development and parent-child attachment, and support and counseling for achieving life skills.

The underlying philosophy of these programs is defined in the Health Realization literature. According to Roger Mills, Ph.D., author of <u>The Health Realization Primer: Empowering Individuals and Communities</u>,[13] everyone has potential as a human being for well-being, wisdom and self-sufficiency. While in the past, "helpers" have focused on negative feelings and on changing negative behavior, a Health Realization approach focuses on the participant's innate resources for health, for learning and for natural motivation. When the professional helper develops an understanding of how we are separated from our innate mental health by how we've learned to think about ourselves and the world, she is able to relate to a participant as a partner to help her recognize her own common sense, insight and healthy perspective. Through such a relationship of respect, the professional is "invited to teach" rather than forcing information through an unequal relationship in which the professional is the expert and is needed by the participant to direct her life.

Another important result of this approach is decreased frustration and "burn out" among professional staff. All Interconception staff participated in a two and a half day workshop to support their understanding of this approach to the professional-client relationship, and the understanding is further developed in individual supervision and through team conferences (discussed further following a description of the programs). Case managers also received training in understanding culturally appropriate practices.

Case Manager Activities

- Case-finding and screening to identify appropriate clients for case management.

- Assess the client's needs and goals. This included assessing the physical, functional, social, environmental, psychological and financial status of the client.

- Develop, implement, monitor and modify a plan of care through an interdisciplinary and collaborative team process, in conjunction with the client and with her caregivers.

- Coordinate care and services needed by the client.

- Link the client with the most appropriate institutional and community resources.

- Advocate on behalf of the client for scarce resources and help develop new resources if gaps exist.

Within the framework of the health realization strategy, the case managers had numerous concrete tasks and activities, such as:

- Counsel and assist clients in problem-solving and behavior change.

- Act as a liaison between different service organizations working with the client. Vigilantly protect client confidentiality.

- Facilitate access to resources.

- Educate the client and family regarding risk factors for optimal health outcomes and psychosocial functioning

- Facilitate the goal of self-care/self-determination by the client and her family.

Sample Case Reports

CASE REPORT #1

Angela is a 33-year-old woman with three pregnancies and three deliveries. She delivered a 33-week baby girl weighing four pounds, 0 ounces. Angela had no prenatal care and tested positive for cocaine at delivery. The baby was delivered at home and was taken into protective custody and then placed temporarily in foster care.

Angela's family, which includes the child's father and their 7-year-old son, has experienced a history of homelessness and interaction with Social Services. Angela tested positive for cocaine seven years ago, after she delivered her oldest son. She lost custody of him due to the chaos in her life, including unstable housing and drug use. All of her pregnancies were unplanned.

The children's father reported that he was not aware of Angela's cocaine use until after both children were born. He has two adolescent children in the custody of Social Services, as well, due to concerns about physical abuse.

Angela engaged easily and was eager to cooperate with the various agencies involved. Her goals included maintaining stable housing, accessing substance abuse treatment and family planning, referrals for community resources, and parenting/child development education.

Many sessions were devoted to allowing Angela to express her fears and concerns related to the involvement of Social Services and

Important Domains:
- **Maternal Health**
- **Life Necessities**
- **Maternal Role**
- **Relationship Issues**

the problems she was experiencing with the child's father. Additionally, time was spent educating Angela on how her chaotic lifestyle impacts her family. She was receptive to information and guidance on child development. She was able to access a number of resources provided. She enrolled in a substance abuse treatment program and with the exception of one relapse remained free of drugs. She also secured and maintained stable housing. Her family participated in parenting classes and both learned alternative safe forms of discipline. Angela and the child's father became gainfully employed, accomplishments they both took great pride in.

Thankfully the baby did not experience any complications and she did well developmentally. The IHPI program assisted Angela with enrolling her daughter in an Early Head Start program. We were also able to assist her with obtaining a tubal ligation, which she desired. Finally, with Angela's consent, much time was spent coordinating the efforts and care plan with the various programs involved which was an important factor in the success the family ultimately experienced.

- Document all contacts with the client and communicate with others involved in the care of the client, within the limits of release of confidentiality.

- Monitor the client's progress toward goal achievement and routinely reassess changing needs.

- Monitor activities to ensure that services are actually being delivered and meet the needs of the client.

- Monitor the plan to ensure the quality, quantity, timeliness and effectiveness of services. Provide periodic reassessment to assure that services are appropriate, cost-effective and not increasing the client's dependence.

- Evaluate client and program outcomes to determine whether the client should continue in the program or be assigned to inactive status.

    The case manager should not:

- Provide all services, especially those that the client can obtain by and for herself.

- Usurp the responsibilities of the client.

- Confuse professional versus personal boundaries with clients

Care Coordination and Advocacy

    Women fell into one of three levels of care coordination intensity:

- Minimal – has skills and general knowledge but needs specialized information and referrals. Self-empowered for follow-through.

- Moderate – needs more support and mentoring, as well as general and specific education and information.

- Intensive – needs skill building in steps, intensive modeling, information and education.

    Nearly all women used some form of care coordination, referrals and services, either inter-agency or intra-agency. Clients were often involved with one or more agencies for themselves or other family members. Coordination among the different service providers was crucial to avoid overwhelming the client and to prevent duplication of services.

Individualized resource development and education

    There were several elements to resource development. First was the continuous and ongoing networking within the Hospital system and within the community. This was a continuous function since the resources were in constant flux and frustration with the barriers is likely to overwhelm clients who have not learned how to navigate the systems. A client is more likely to succeed in following through if the agency is geographically convenient, culturally appropriate and has minimal language and financial barriers. Counseling should include anticipatory guidance regarding what to expect as a consumer, thus preparing the client to cope with the barriers she may meet.

    The second aspect of resource development was locating and organizing educational materials that are language appropriate and sensitive to the learning level of our clients. Basic anatomy diagrams and clarification about the reproductive cycle are important tools,

CASE REPORT #2

Maria is a 28-year-old Hispanic woman recruited in February following a second trimester fetal demise. She was classified a high risk OB patient because she has had eight pregnancies with only two deliveries and her pregnancies have been closely-spaced. Maria felt intense grief over her most recent loss, and she lived in fear and isolation because her husband was frequently under the influence of alcohol and marijuana, and was verbally and physically abusive.

Our goals for Maria included intensive grief support, health education, planning for future pregnancies, exploring domestic violence issues, affirming strengths, coordinating a genetic work up, and facilitating preconception counseling. She is currently pregnant (planned

Important Domains:

- **Maternal Health**
- **Relationship Issues**
- **Life Necessities**

and spaced one year following the previous demise) and compliant with all her high risk OB clinic visits. Her husband has not hit her since we've been involved and he has become more open towards Maria pursuing her own educational dreams in the future. If all goes well with this pregnancy, Maria plans on having a tubal ligation afterward. Her case manager will be involved with her two to three times a month through this pregnancy to help coordinate transportation to appointments, reinforce antepartum education, and provide general support.

empowering a woman to understand her body, understand her treatments and her child's treatment, and to make informed health decisions. Our experience has shown that clinical teaching on subjects such as birth control methods or medication use is often not absorbed in the clinic or hospital setting and that clients do not ask their questions. Effectively engaging women in learning this material requires creativity and sensitivity in the use of various educational modalities according to educational level, language, and cultural orientation (reading, pictures, multi-media).

Among the most frequently used educational resources are materials on:

- women's reproductive cycle, conception, and birth control options.
- low birthweight risk factors.
- child development and parenting skills.
- home safety.
- infant feeding and care.
- smoking cessation.
- exercise and nutrition.
- diabetes.
- high blood pressure.
- stress identification and management.
- bereavement.

Intensive referral

The activity of referral to other services, agencies, programs, etc. covered a great range of involvement and intensity of effort. In select cases it was simply to inform a client about the existence of a service and provide the phone number. This was rare. The concept of "intensive" referral was used here to designate a much more involved and lengthy process that varied according to each individual, the respective barriers and resources of the situation, and the complexity of "making the connection". The home visitor was likely to be engaged in advocacy, role-modeling, problem-solving counseling and any number of such actions in the process of reducing the barriers to successful service referral, often one as deceptively simple as a clinic visit. Often the home visitor had to accompany the client in order to support the required problem solving regarding the many barriers along the way. Linking clients to services was often difficult, requiring negotiation on the part of the home visitor. Clients could not be left alone to access the service network once the referral was made. The home visitor had to pave the way as much as possible to reduce conflict and enhance the possibility of success. This sort of intervention contributed to the development of client self-efficacy learning by direct role modeling, and provided direct affirmation of the client's experience of the obstacles to be overcome in a balky health and social services system.

Empowerment

For our work to be considered empowering, every intervention should have referred back to the fundamental goal of supporting and increasing self-efficacy. Although we may have done more than half the share of work initially, for the purpose of gaining a woman's trust and engagement in the program, this was a short-term means to the end of empowering her to realize her ability to manage her own health and welfare. She may have needed information, skills to acquire information and resources, or encouragement and self-confidence to take on the role of self-advocate. Careful listening helped the home visitor to learn which level of response was indicated. The client was helped to understand that "letting

CASE REPORT #3

Rita is a 29-year-old Hispanic woman who was recruited following a second trimester fetal demise. She had a significant history of high risk pregnancies over seven years, including a fetal demise at 32 weeks, a preterm delivery at 32 weeks, a preterm delivery at 30 weeks, and another fetal demise at 24 weeks. Due to a condition called Rh isoimmunization she was counseled against having another pregnancy.

Rita initially was reluctant to participate in the program but expressed sadness and anger over the loss of her baby. She was very interested in long-term birth control. An appointment with the genetics counselor helped her answer some questions about the baby's death and the risk of future pregnancies. Following the meeting, our contact with Rita was mostly by phone until, during a home visit, we found out that Rita was four months pregnant. A referral was made the same day to a high risk OB clinic. Rita was given appointments for ultrasound and OB intake within four weeks.

Rita was very motivated to have a healthy baby and kept all of her numerous appointments with the perinatal specialist for fetal transfusions and ultrasounds.

Important Domains:

- **Maternal Health**
- **Family Planning**
- **Relationship issues**

We provided taxi vouchers because transportation was a significant barrier for her. Rita often had to take her four girls with her, on the bus, to the OB appointments. During the course of the pregnancy she and her husband decided to request a tubal ligation if the baby was born by cesarean section. In October the medical team recommended to deliver the baby within a week either by induction or cesarean. Both options were discussed with Rita in detail. She discussed the recommendations with her husband and they decided to have the baby by cesarean section.

After four girls, the family was very happy with their new addition, a baby boy. She had not breastfed her other children, because she thought that her milk was not good enough. With support and encouragement from the home visitor she was able to provide this baby with breast milk for the first six weeks of his life.

go" of negative thoughts and impressions about herself would allow her native resilience to surface intact. Then she could readily absorb and use the information and support available. This resulted in a "virtuous cycle" of increasing competence, as opposed to vicious cycles of disempowerment.

Modeling, mentoring, coaching

Modeling, mentoring, and coaching have been identified by the self-efficacy literature as the primary means to increase a person's confidence, skills, and initiative in health promoting behavior. The mentoring relationship enabled us to assist women to overcome personal barriers reflected such as inadequate problem solving skills, low initiative, lack of communication skills, and perceived low self-efficacy. These deficits may be due to lack of experience, or a lack of competent examples and poor modeling during their formative years. We often have found a pattern in the lives of our moms where their "mothering person" has been impaired or missing to a significant extent.

Direct role modeling of activities can consist of making phone calls to obtain information, being persistent in contacting various agencies, clarification of problems, brainstorming for alternative problem solutions, and validating the client's experience in dealing with frustrating bureaucracies. The client observed and then tried it out herself in stepwise manner which built skills and confidence. Other modalities were sharing of personal experiences and story telling. Guided by sensitivity to "where the client is" a home visitor led, guided, coached or taught so long as respectful boundaries were maintained and the client's self-efficacy was nurtured. Hopefully, she will experienced

the message that her health and well being are important in both words and action, and that she has "what it takes" to take effective action on her own behalf.

Counseling

The home visitor assisted each woman in meeting her goals through a variety of practical strategies. While home visitors were called upon to provide supportive counseling, they were also trained to identify situations needing further referral, such as:

- psychiatric or psychological evaluation
- psychotherapy
- longer term support
- needed boundaries between client and home visitor
- substance abuse intervention
- couple or parent/child counseling
- other in-depth counseling needs

As a result of her close involvement with the client, the home visitor was a participant-observer of the family norms and roles, support systems, health attitudes, habits, and environmental stresses. She was able to assess factors which are resources, or which possibly contributed to the poor pregnancy outcome.

The experiences around high-risk pregnancy and childbirth create new demands on individual coping and on couple and family relationships. This is even more likely to be the case when the woman has a complicated pregnancy, the child has special needs or there is a fetal death. These events often provoke much anxiety, an upsurge of issues in adjusting to the stressors, and in coping with loss and grief. In some cases the emotional reaction to the

CASE REPORT #4

Clara is a 26-year-old married Hispanic woman referred to the program following her second fetal death due to anencephaly (absence of all or major parts of the brain). Her first born son was born healthy, so she struggled to accept that she was lacking the essential folic acid needed to minimize the risk of another poor outcome. Her case manager was surprised at how much she would struggle with accepting folic acid supplementation. This struggle kept her case manager working with her for a year and a half.

Her goals during IHPI included grief counseling, becoming employed, securing affordable housing, and having a healthy baby. At the point of discharge, we felt she was taking the right steps to maximize her chances of a healthy pregnancy. She had not yet conceived and was using the health care system appropriately. The case was closed.

Four years later Clara unexpectedly contacted her case manager. She was calling to share her joy and to thank the case manager. She was 7 months pregnant with a healthy baby boy. Furthermore, she excitedly reported that she had gone on to receive her Certified Nurse Assistant certification and now was happily employed by a nursing home. She and her husband had recently received their residency papers and had bought a home. When asked her what she thought contributed to her healthy pregnancy, she stated that she remembered all those "frank" talks about folic acid and decided to take the supplements when her doctor prescribed them three months before she conceived. She warmly thanked her case manager for the time they spent together and said she would never forget how helpful it was to her well-being.

Important Domains:
- **Maternal Health**
- **Maternal Role**
- **Life Necessities**

current loss or crisis is exacerbated by reliving earlier losses or disappointments thus presenting the risks of depression, poor parent-child bonding or damage to greatly needed supportive relationships. However, this can also be a real opportunity to re-work and let go of problematic issues from the past and "clear the path" for her innate resilience to express itself and provide more energy and confidence for her future.

As the home visitor became a known and trusted presence, she was able to respond to a clients' needs and feelings as they surfaced. In this manner, many psychosocial health issues came forth for reflection and processing that the case manager may not have thought needed a referral to an outside "therapist". These may have included counseling with regard to grieving, relationship risks and concerns, problem solving, self esteem issues, and identification of personal and familial barriers to health promotion and unmet needs.

Because of the frequency with which these issues arose, we found it necessary to develop the counseling component of the home visits to a greater extent than anticipated. Community mental health services are restricted to those with more severe and/or chronic mental illness. Affordable counseling is scarce and language barriers have been a problem. Even when counseling is available and affordable there are often long waiting periods for care, and thus the home visitor must bridge the gap. Increased focus on counseling approaches was necessary both in new staff training and in ongoing in-service programs.

CASE REPORT #5

Kim is a 26-year-old woman who delivered her first baby at 34 weeks gestation—a boy weighing three and a half pounds. This was an unplanned pregnancy and Kim started prenatal care at 22 weeks. Recently married, she had never used any form of birth control and was eager to absorb any information that could help her make an informed choice. Our shared goal was to provide information about factors influencing preterm labor, postpartum appointment compliance, preconception counseling, birth control information, planning for future children, community resources available to meet food and utility needs, child development information, and bus tokens. As trust developed, she

Important Domains:

- **Maternal Health**
- **Maternal Role**
- **Life Necessities**
- **Relationship Issues**

disclosed that she had recently become aware of her husband's excessive alcohol consumption and desired more information about alcohol use and health. Kim was eager to learn and open to change habits that could improve her health. This information was shared over five visits and as needed thereafter until our 6-month/termination interview.

CASE REPORT #6

Rose is a 31-year-old married Hispanic woman who delivered her third child at 32 weeks gestation, a boy weighing four pounds one ounce. This was an unplanned pregnancy; Rose is a single mother, providing for her two school age children. She started her prenatal care early and experienced complications throughout her entire pregnancy. She was hospitalized twice for vaginal bleeding. Later she was treated for Group B *Strep* infection and preterm labor. She returned home on bed rest. She had to leave her job and was very concerned about paying her bills and providing for her children. The father of this baby left for Mexico right at the time she had to go on bed rest.

Important Domains:

- **Family Planning**
- **Life Necessities**
- **Maternal Role**

Her case manager met Rose two weeks after her delivery at the neonatal intensive care unit where she visited her baby daily. Before she left the hospital, Rose signed papers for a tubal ligation. Since she had no coverage for this procedure, the IHPI program was able to help her reach this goal by offering to pay for the tubal ligation which was performed in December.

Case Categories

During the course of the program, the case managers identified several categories of women according to the types of critical issues occurring in their lives. Many women fit into more than one category, while some did not easily fit into any of these groupings.

1. Teens with smoking and/or substance abuse issues

- very hard to recruit and engage
- family planning is a major concern
- parenting is a major concern
- "potential for damage" is high

2. Teens struggling between developmental stages

- work/school issues
- relationship issues
- navigating the system
- family planning
- parenting issues
- "potential for damage" factor is moderate

3. Teens without stable relationships

- poor family planning knowledge and use
- poor use of system and resources
- poor parenting skills
- "potential for damage" factor is low

CASE REPORT #7

Sara was a 16-year-old woman who had two pregnancies and one delivery. She delivered a baby girl at 33 weeks gestation who weighed three pounds five ounces. Complications included a history of urinary tract infections, anemia and premature rupture of the membranes. She had a history of unplanned pregnancies and had received an abortion one year prior to giving birth to her daughter.

Important Domains:
- **Maternal Health**
- **Life Necessities**
- **Maternal Role**
- **Relationship Issues**

Sara had a very limited social support system. Her housing was unstable due to volatile conflict at home. Her mother's boyfriend and brother who lived in the home were alcoholics. As a result, she often lived with various relatives and friends during the pregnancy. In addition, Sara's mother's boyfriend was abusive towards her mother. The father of Sara's child had a history of domestic violence, drug use and gang association. Sara was clearly unhappy in her relationship with child's father. She had dropped out of school prior to this pregnancy and was unsure if she wanted to return.

Sarah and her case manager agreed to goals of providing ongoing support and assistance as needed in the areas of child development, parenting strategies, family planning, domestic violence education, and financial and housing resources. Regular home visits were conducted where much time was spent developing trust by providing encouragement and affirming strengths.

Sara completed the program after one and a half years with a great deal to be proud of. She enrolled in a GED program and secured Section 8 housing when she turned 18 years old. After much support and guidance Sara followed through with a Temporary Assistance to Needy Families application, receiving those benefits along with subsidized child care funds. She separated from the child's father after he physically abused her in the presence of their daughter. Sara is now involved with another young man who is supportive and positively connected with his family. After some trial and error with different birth control options, Sara settled on and maintained consistent use of the Depo-Provera shot. Perhaps Sara's greatest accomplishment was her daughter who thrived developmentally.

4. Multiple births with several poor outcomes, or first birth (not teens) with poor outcome

- easy to engage
- poor outcomes related mostly to medical conditions
- lack understanding or in denial
- need orientation to system and education regarding family planning and reproduction
- receptive to support
- can benefit from parenting information
- "potential for damage" factor is low

5. Multiple births, poor outcomes, and substance abuse

- difficult to engage
- poor outcomes mostly related to poor self care
- not as receptive to education due to constant crises
- don't make good use of referrals
- hard to penetrate their self-view of being defeated
- often have lost kids to Child Protective Services
- hard to stay in touch (lack of phone, frequent moves)
- grief counseling works
- emotional support works
- available for crisis counseling
- flexible regarding missed appointments and rescheduling
- "potential for damage" factor is high

6. Immigrants

- lack basic resources
- some isolation and domestic violence
- need family planning and help negotiating the system
- education, referrals and support work
- benefit from parenting information
- biggest problem is when they move
- "potential for damage" factor is low

CASE REPORT #8

Shawna is a 32-year-old woman. Her fifth child, a son, was born at 24 weeks gestation by emergency C-section and weighed only 1.5 pounds. He still had fused eyes, incompletely developed heart valves and required a 96-day NICU stay and several surgeries. He managed to recover from hyaline membrane disease, hyperbilirubinemia, anemia, yeast infection, and serial bradycardia. He was taken into custody by Social Services and has severely impaired vision and hearing.

Shawna had no prenatal care and tested positive for cocaine and alcohol abuse. She had premature rupture of membranes, chorioamnionitis, anemia, urinary tract infections and bacterial vaginosis. This was her seventh unplanned pregnancy. Her ex-husband has custody of their 12 and 14-year-old daughters, and Shawna has been in an eight-year common-law relationship with her youngest child's father. Social Services had taken custody of her 7-year-old and 4-year-old and placed them in foster care.

Shawna was very distraught at having harmed her son and at having caused her children to be taken away. She was highly motivated to regain custody but had many obstacles to overcome. First, she needed to remain abstinent from cocaine and alcohol. Another major obstacle was her troubled relationship. Social Services discovered that her current partner had been accused of sexually molesting the two teenage girls. As we worked together it was revealed that he had been abusive toward Shawna for a long time. As she changed her way of living, it was a major turning point that she filed a complaint against him. She had no income and had to bear the stress and loneliness of staying at a shelter or the homes of unwelcoming relatives, yet she managed to keep her urinalysis, group counseling, and therapy appointments.

During this chaotic time she missed many appointments and, having no

Important Domains:

- **Maternal Health**
- **Relationship Issues**
- **Maternal Role**

phone, she could not be contacted. However, during the IHPI initial phase, her case manager built trust and rapport, so Shawna would call and "plug in" for support. She needed assistance in understanding "the system," counseling to validate her perceptions and experience, and a safe place to express her frustration and pain. She was enabled to maintain a more appropriate, patient attitude while dealing with the obstacles of treatment appointments, attending the baby's therapy, meeting the older children's needs, court dates, appointments with the caseworker, finding a job, looking for affordable housing, and attending to her own health care.

Shawna's family history had a major impact on the way her life was going. She was abandoned by her alcoholic mother at six months, was shunned by her stepmother, and was sexually abused by men in the family. She was raised by her elderly grandmother and became pregnant at 16. Shawna never had instruction in birth control or any health care for herself. On her own she had earned a GED and certification as a beautician but never learned to value herself.

Currently Shawna is developing those skills needed to take care of herself. She has regained custody of all children (except the baby) and is continuing the struggle to prove she can care for him too. She has her own apartment, paid for through waitressing, and she has "graduated" from the drug treatment program. She has obtained treatment for her health problems and had a tubal ligation with IHPI help.

7. Want tubal/family planning

- don't follow through due to other issues always taking precedence
- personal needs are last priority
- help them resolve crises so they can take care of business
- "potential for damage" factor is moderate

8. Homeless and chaotic

- low skills
- emotionally compromised
- often includes domestic violence and substance abuse
- "potential for damage" factor is high

9. Combination of poverty and cognitive impairment

- don't plan for future at all
- need permanent involvement to make up for cognitive deficits
- "potential for damage" factor is high

CASE REPORT #9

Lisa is a 22-year-old who delivered her fourth baby, preterm, at 35 weeks gestation. Her daughter was admitted to the NICU weighing four pounds four ounces. Lisa had only four prenatal care visits and was admitted for pre-term labor at 34 weeks. Lisa's complications included anemia and tobacco use, a history of STDs and abnormal Pap tests. Lisa signed papers for a tubal ligation, but after delivery decided to postpone her tubal ligation. Her plan was to have the procedure in six weeks. She accepted the IHPI program only for assistance in obtaining her tubal.

During the first home visit Lisa stated she was in the middle of eviction proceedings. The father of the child had been killed the month before by "a friend" and her cousin had "misused" her low income apartment while she was hospitalized so Lisa was facing a problem with housing. During the visit, it was also determined that Lisa has three other children (8, 5 and 2 years old), had a 9th grade education and was unemployed. She lacks reliable transportation and also needed food for her children.

During the next several weeks, Lisa stayed in irregular contact following her eviction (she had no phone) but the case manager consistently responded by helping her think through and resolve various small crises, assisting with the housing issue, and providing verbal support regarding her efforts to manage her life, while continuing to encourage a postpartum visit for crisis counseling.

Six weeks after delivery, a fire destroyed the home where Lisa and her children were staying -- and all of Lisa's belongings. Additionally, Lisa's eight-year-old daughter had been missing a lot of school because of their homelessness and the school was threatening truancy. When the baby was brought to a local hospital, the family was referred to Social

Important Domains:

- **Maternal Health**
- **Life Necessities**
- **Maternal Role**

Services. The IHPI case manager worked with her to locate clothing, housing and provided transportation to help her keep her Social Services appointments. At this point, the case manager feels that Lisa really engaged and that a trusting relationship was beginning to develop.

Soon after, Lisa "hit bottom" and disappeared for 3 weeks. She finally called and acknowledged that she thought she was pregnant, and expressed anger with herself for further complicating her life. She stated she had been renting a hotel room and was not managing her money very well. Together, Lisa and her case manager began processing her options for regaining control of her life. After much encouragement and support, she agreed to accept help from her family, placed her three older children with relatives, and she and the baby moved in with an aunt. She had her pregnancy confirmed and begin receiving prenatal care.

Finally, Lisa was ready to receive much-needed health education. She is participating in the Prenatal Plus program and is making significant progress in reducing her tobacco use. Currently, Lisa is looking for a job and following through with Social Services requirements. She has decided to allow her 2 older children to remain with her aunt where they are experiencing some badly needed stability. She and the 2 younger children are in a stable housing situation, her new boyfriend is out of jail and is being very supportive. She plans to have her tubal ligation when she delivers this baby.

THE RESULTS

THE RESULTS

Evaluation Methods

The evaluation of the IHPI program primarily centered around the following questions:

• *"What proportion of eligible women are recruited by the IHPI program?"*

• *"Are certain types of women more likely than others to agree to participate in the IHPI program?"*

• *"What types of services do the IHPI clients use while in the program?"*

• *"Do the services used by the IHPI participants vary from woman to woman?"*

• *"What types of changes do the program participants make while in the program and are these related to the services received?"*

• *"Are women who complete the program more likely to comply with post-partum care and birth control use?"*

• *"Are those who complete the program more likely to delay their next pregnancy?"*

• *"Do program Completers have better outcomes in subsequent pregnancies than those who did not participate?"*

Each of these questions pertains to different subsets of women. The first question, for example, encompasses all women who had a problem pregnancy or delivery in the Denver Health system. The last question, however, is pertinent only to women who completed the IHPI program and went on to have another pregnancy. To separate out these subsets of women and the questions that are pertinent to them, the program evaluation results are reported in the following separate sections:

• 1. **Program Penetration Analysis** -- This section describes the scope of the pregnancy and birth problems in the target population and then examines the proportion that was addressed by the IHPI program. Cases included in this section consist of all women with a qualifying problem pregnancy in the Denver Health system.

• 2. **Program Participant Analysis** -- This section explores the differences between the women who enrolled in the program and those who did not. The analysis includes all eligible women who were contacted by the IHPI program.

• 3. **Use of Services Analysis** -- This section summarizes the types and amounts of IHPI services used by the participants in the program. Also, it estimates the risk levels of the IHPI clients and the relation this has to their use of services. The cases that are examined in this section are program participants who had been in the program long enough to receive some of the program's services.

• 4. **Program Completer Analysis** -- This section explores the longer-term effects of the program relative to

women with similar pregnancy problems who did not receive the program's services. Cases in this section include women who completed the program compared to similar women outside of the program.

Each of these analysis sections has a brief introduction which describes the questions that are addressed in that section as well as which cases are included in the analysis. The sections have explanatory text and graphs, while the detailed tables of data are available in the Appendix with references throughout the text.

The data collection segment of the IHPI evaluation consisted of several steps. First, basic qualifying data were collected on all births and fetal demises in the Denver Health system. (The specific criteria are listed in the Appendix on page 126). If the preliminary IHPI qualifications were met, a Recruitment form, which covers basic demographic and health information, was completed through a review of the medical record. (The Recruitment form is in the Appendix on page 132.) If the woman agreed to participate, an Intake form was completed. The Intake form covers much more detailed information pertaining to the woman's medical, psychological and social risks and resources. (The Intake form is in the Appendix on page 138.)

Two additional forms were used to collect data on the program participants at approximately six and 12 months after enrollment. These were both very similar to the Intake form. The 12 month form was also used as an "exit" form, if the woman completed the program before the end of the 12 month period.

The final data collection elements pertain to follow-up material regarding subsequent pregnancies. For program Completers and Decliners, Birth Certificate records from the State of Colorado were examined for the outcomes of any subsequent deliveries. In addition, for comparison purposes, the medical records of selected women who qualified for the program but who were not contacted by the program were collected into a database similar to the IHPI Recruitment form. Birth Certificate records on their subsequent deliveries were also examined.

Figure 1 (page 61) summarizes of all of the cases involved with the IHPI program from late 1995 to the beginning of 2002. This is an overview of all the people connected with the study in any way -- and their program status as of the beginning of 2002. From the inception of the program, there have been 559 women connected with the IHPI project. There were 296 participants in the program, and 238 who were recruited declined participation. There were an additional 25 cases who were part of a study sample of women who qualified for the program but were not eligible due to their particular circumstances, such as multiple births, language barriers, involvement in another program, etc.

On the right-hand side of Figure 1, the bar graph shows the level of involvement for the 296 IHPI program participants. Of the women who participated in the program, half had completed an exit survey by the beginning of 2002, one quarter completed a 6-month form, and another 25% only had an intake-form.

The exact numbers and percentages are listed in Table A on page 159 of the Appendix. Not all of these cases are included in every sub-analysis of the IHPI project because some of these women had not had time to complete the program or

Figure 1

IHPI STUDY POPULATION SUMMARY
DECEMBER 1995 - JANUARY 2002

COMPARISON SAMPLE 25 (4%)

DECLINED 238 (43%)

PARTICIPATED 296 (53%)

EXIT

SIX MONTH

INTAKE

TUBAL SERVICE

PROGRAM PARTICIPANTS
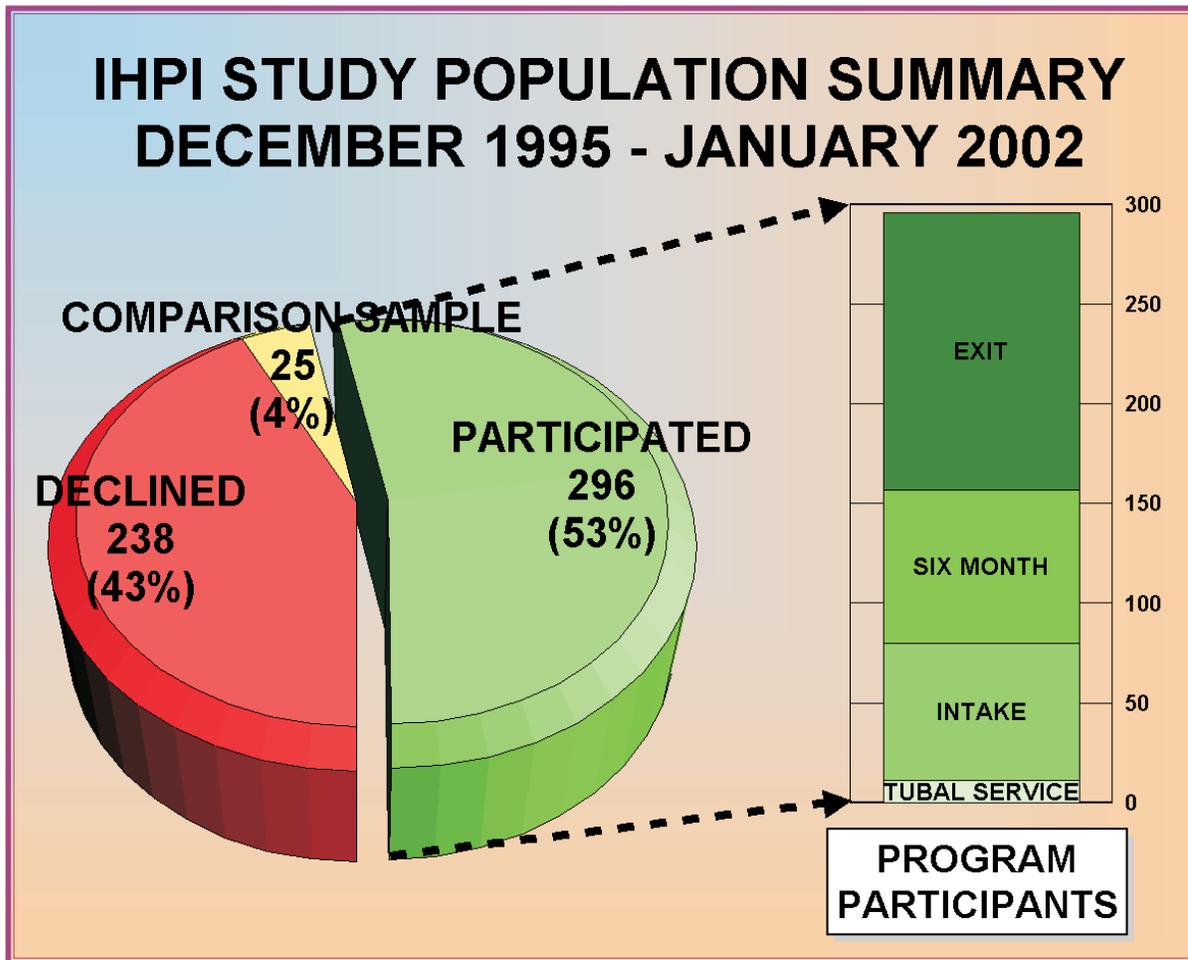
provide adequate data at the final point of analysis. Exactly which cases are included in which analytic section is specified at the beginning of each section.

One of the challenges in describing a program of this nature, where clients can enter and leave the program at any time, is to provide as complete a picture as possible of the population. At any point in time, the cumulative number of people who have qualified for the program, as well as the number of clients who have completed the program, or dropped out, varies. The analyses in this report are based on the status of the women who had been involved with

the program as of 9/1/1999. This date was selected to provide an adequate time frame for a valid follow-up period to examine subsequent pregnancies, program encounters and other factors. It must be pointed out that many of the women who had not completed the program by 9/1999 have gone on to complete the program, but they are not included in this report as "Completers". Figure 2 on page 62 summarizes the number of cases as of 9/1/1999 which were used in this report in the evaluation of the IHPI program.

For the purposes of this report, there were 478 women who qualified for the IHPI

Figure 2

MOVEMENT OF THE ANALYZED SUBSET OF INTERCONCEPTION CLIENTS

478 women contacted
- qualified for program
- eligible for program
- within time-frame

255 participated
53.3%

244 intakes
51.0%
95.7%

162 six month
33.9%
63.5%

91 exit
21.0%
35.9%

71 no exit
14.9%
27.8%

82 no six month
17.2%
32.2%

11 tubal only
2.2%
4.3%

223 declined to participate
46.7%

% of recruited cases
% of participating cases
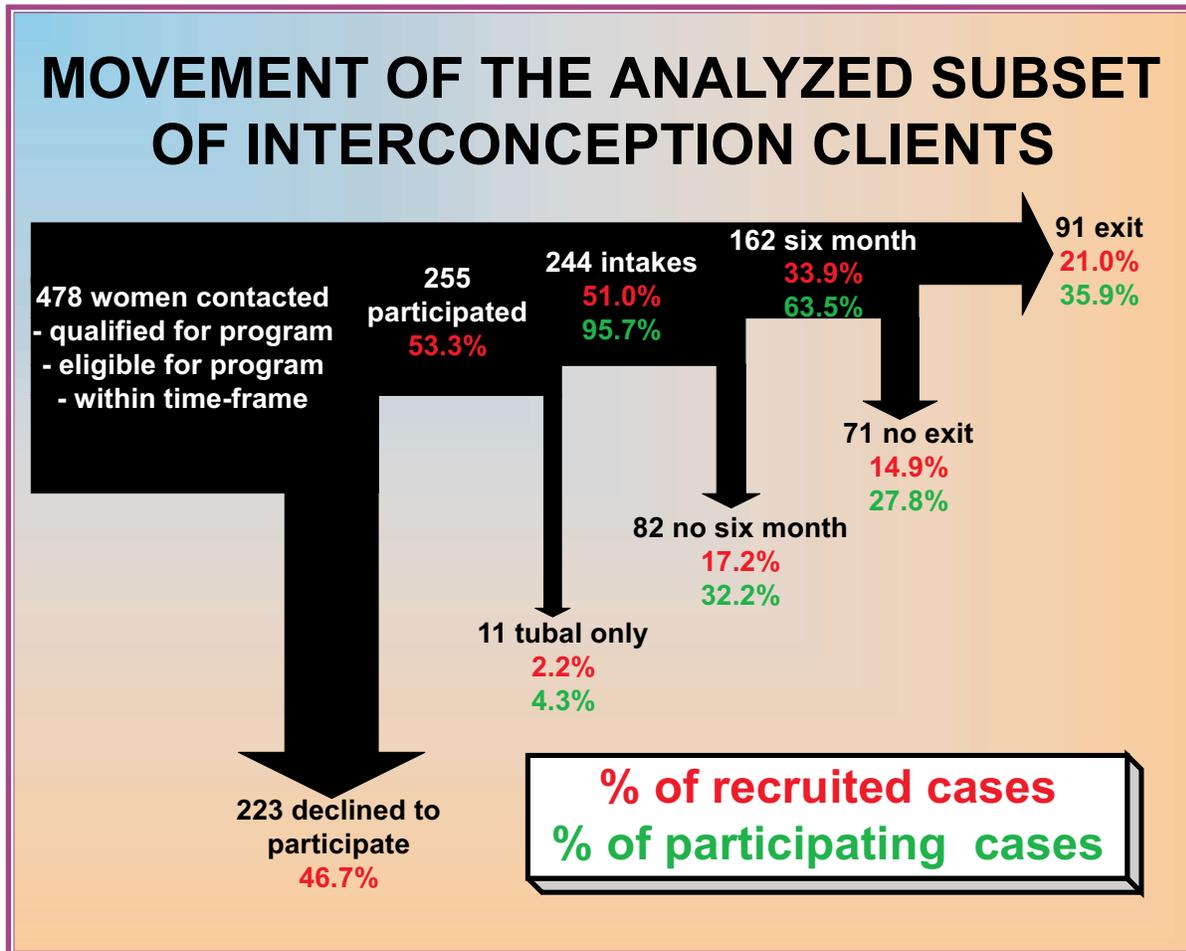
program, and who met all of the eligibility requirements, and who were contacted by the IHPI staff. Of these, there were 255 (53.3%) who agreed to participate in the program. The vast majority of these women (96%) became fully involved in the program, while 11 enrolled only to get a tubal ligation. There were 162 women who were involved long enough to have a 6-month survey (referred to as "Completers"), with 91 of these also having 12-month/exit surveys. A complete accounting of these women is presented in Table A on page 159 of the Appendix.

Figure 3 provides a summary of the following analysis sections, what study questions are addressed in each section, which cases are included and what comparisons are made.

Figure 3

ANALYSIS SUMMARY

SECTION TITLE	MAIN STUDY QUESTION	INCLUDED CASES	COMPARISON MADE
Program Penetration Analysis	"What proportion of eligible women were recruited by the IHPI program?"	Women with Qualifying Problem Pregnancies	Eligible vs Not
Program Participant Analysis	"Are certain types of women more likely to agree to participate in the IHPI program than others?"	Eligible Women Contacted by the Program	Program Participants vs Decliners
Use of Services Analysis	"What types of services do the IHPI clients use while in the program?"	Program Participants	High vs Low Risk
Program Completer Analysis	"Do program completers have better outcomes in subsequent pregnancies than those who declined to participate in the program?"	Eligible Women	Program Participants vs Non-participants

Program Penetration Analysis

"What proportion of eligible women were recruited by the IHPI program?"

Included in this section are all deliveries at Denver Health that met the IHPI qualifications (low birthweight, congenital anomalies, fetal demise, etc.) between 1/1/1995 and 7/1/1998. This is the period for which we have complete information on all low birthweight deliveries at Denver Health.

There were several qualifying neonatal conditions for eligibility in IHPI:

- a low birthweight baby,
- a newborn with a congenital anomaly,
- a fetal demise.

However, qualifying cases with certain conditions, for example, a language barrier, multiple births for the current delivery, currently incarcerated, etc. were excluded. (The complete list of exclusions is specified in the Appendix on page 126.) Not all women who qualified for the IHPI program were eligible, and not all eligible women participated in the program.

Using Denver Health birth records for 1996, we estimated the number of deliveries that met the basic qualifications of the program, and the proportions of these that were eligible and actually became involved in the IHPI program.

Figure 4 on page 65 summarizes the reasons for qualification, and shows the proportions that have multiple reasons. By far, the primary reason for qualification (seven out of ten qualifying deliveries) is having a low birthweight baby.

Figure 5 on page 66 summarizes reasons why qualified women were excluded from the program. The most common reasons for ineligibility were:

- having had a tubal ligation after the birth of the current child (43%)
- having a multiple gestation birth -- twins, triplets, etc. (29%).

For the complete numbers see Tables B, Cand D beginning on page 160 of the Appendix.

We did a more detailed examination of those women with low birthweight deliveries (70% of the qualifiers). Using data on all low birthweight deliveries at Denver Health over a three and a half year period, we could examine the number, and the proportion, of low birthweight deliveries that the IHPI program was able to serve.

Figure 6 on page 67 shows the number of low birthweight deliveries at Denver Health Medical Center from 1995 through mid-1998 (the yellow area in the graph). The vast majority of these cases met the criteria of the IHPI program (the blue area in the graph). The actual month-to-month figures are in Table E on page 162 in the Appendix.

The IHPI program starting recruiting patients in late 1995. The green area in

Figure 4

REASONS FOR PROGRAM QUALIFICATION*

ALL BIRTHS

DEATH

LOW BIRTHWEIGHT

NOT QUALIFIED

ANOMALIES

0%
3%
59%
8%
29%

100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%

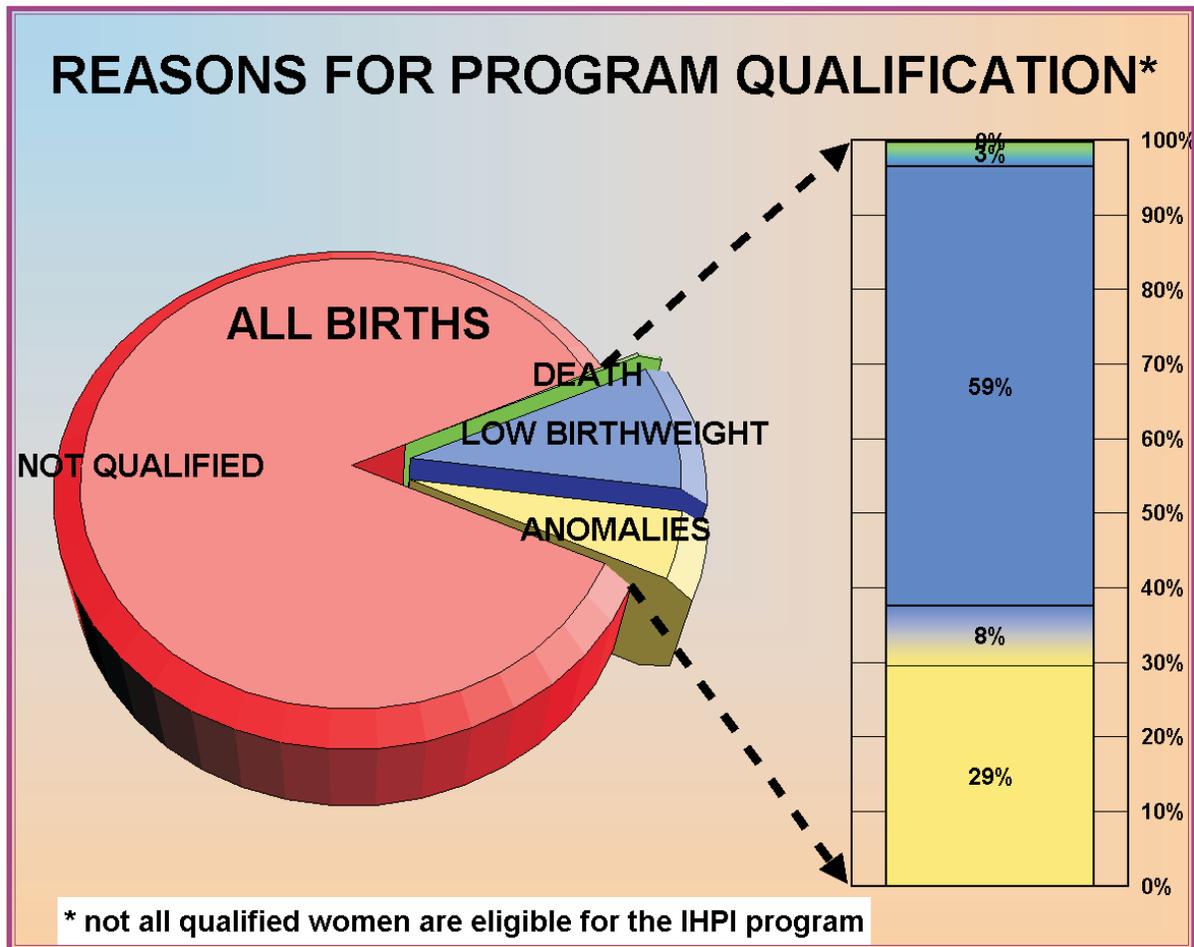* not all qualified women are eligible for the IHPI program

Figure 6 shows the number of mothers contacted (which was affected by the number of available slots in the program). The numbers of women enrolled (actually participating in IHPI) are shown in red.
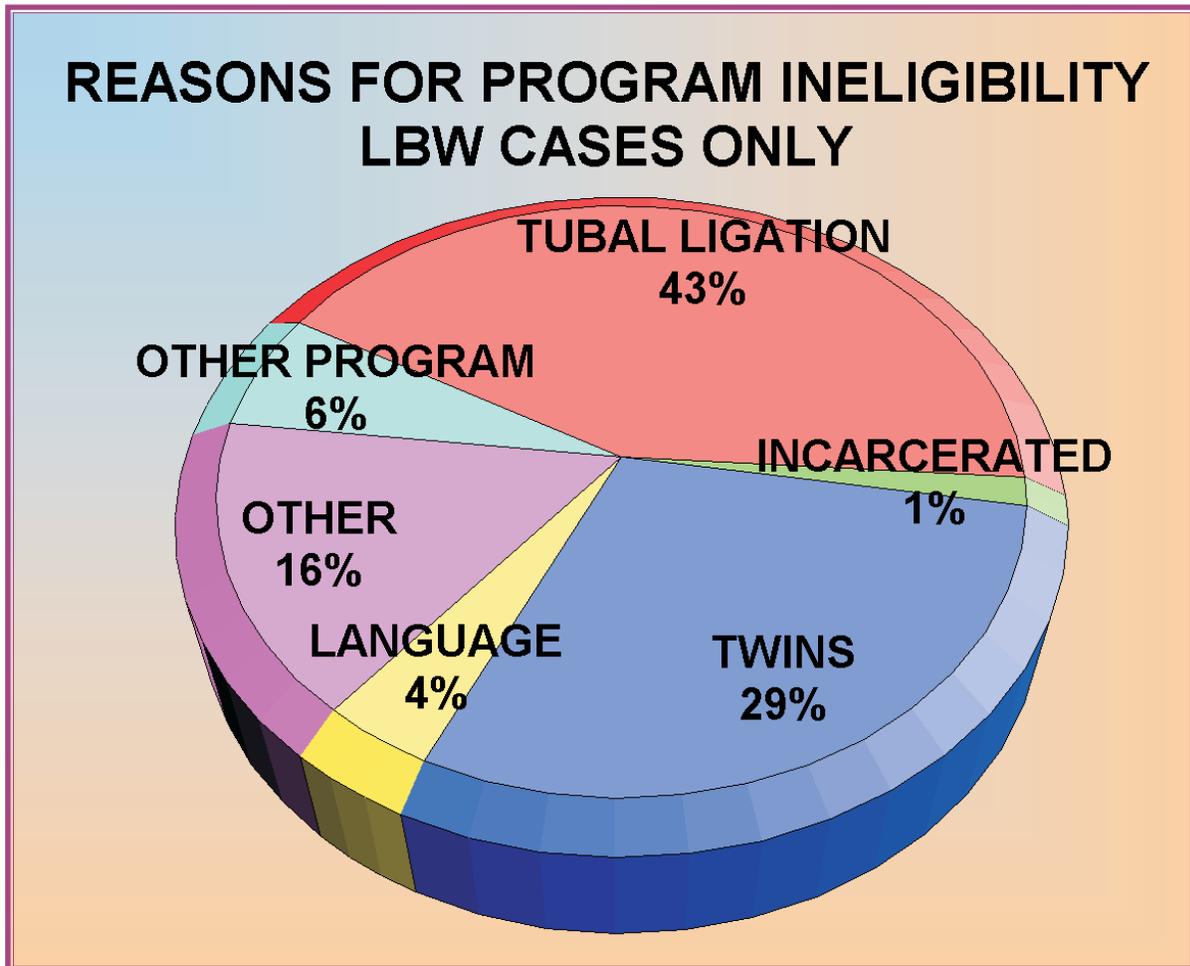
Because of the monthly variation in the number of low birthweight deliveries we examined program penetration as a proportion of low birthweight deliveries for each month (see Figure 7 on page 68). The proportion of low birthweight deliveries that met the eligibility criteria of the IHPI program varied each month, from a low of 50% to a high of over 90%. The percentages are averaged over time to show the trends more clearly. These trend lines show that the percentage of low birthweight deliveries that were eligible for the IHPI program stayed stable at about 75% of all the low birthweight deliveries at Denver Health over the three year period.

The graph also shows that initially the program contacted a high percentage of eligible cases in 1996 -- more than two out of three cases. But as the available program slots filled, the number of women contacted dropped. At that point, only new cases could be accepted as space became available.

Figure 5

REASONS FOR PROGRAM INELIGIBILITY
LBW CASES ONLY

TUBAL LIGATION
43%

OTHER PROGRAM
6%

INCARCERATED
1%

OTHER
16%

LANGUAGE
4%

TWINS
29%

In addition, the graph displays that the acceptance rate increased over time. Initially, a small percentage of the contacted women agreed to participate, but this increased in every year from 1996 through 1998. By mid-1998, the majority of contacted women became involved in the program. This could be due to better targeting of clients, better recruiting methods, and other factors. The year-to-year figures (numbers and percentages) are available in Table F in the Appendix on page 163.

Although similar breakdowns for the other categories of IHPI targeted populations -- Congenital Anomalies, Fetal Demise, etc. -- cannot be readily done, these other groups combined, account for less than 30% of the total IHPI clients. As a result, overall, the above graphs on low birthweight cases should be highly representative of the total IHPI target population and the proportions that were affected by the program.

Because there were far more qualified, eligible women than the IHPI could accommodate, we also looked at

Figure 6

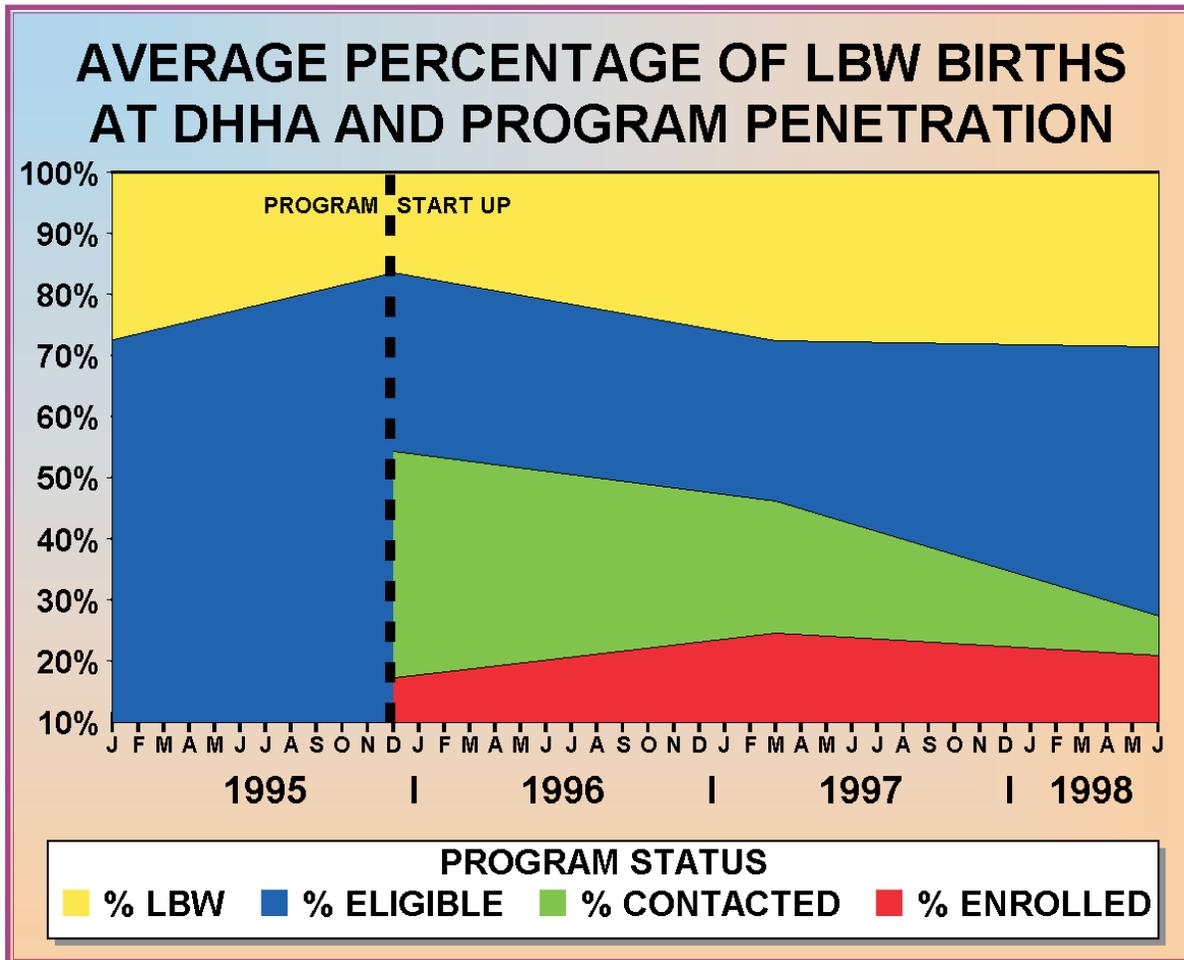**NUMBER OF LBW BIRTHS AT DHHA AND PROGRAM PENETRATION**
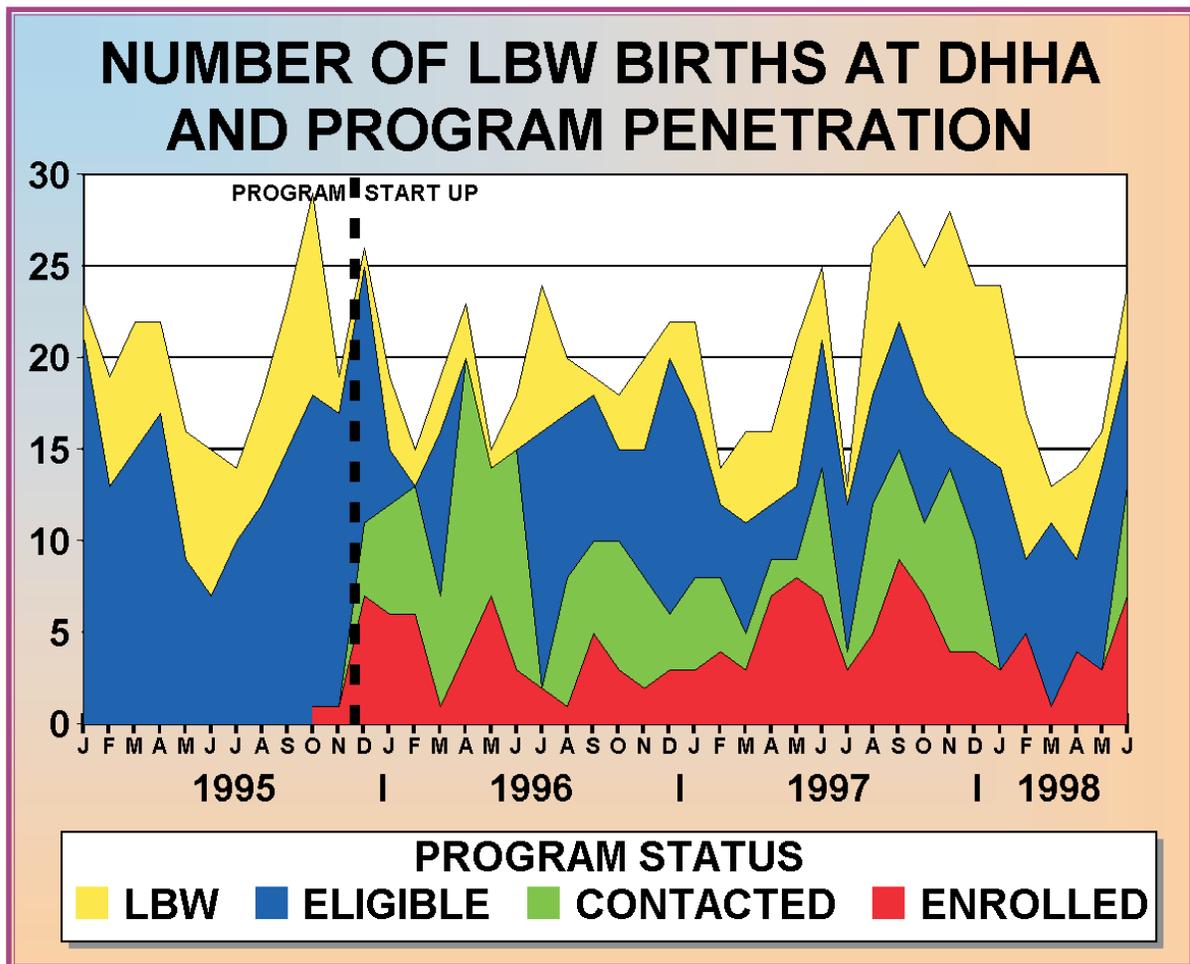
determinants of the selection of potential clients. As mentioned in the Program section, when there were excess eligible candidates, the case managers prioritized recruitment based on several client characteristics. As a result, there were several significant differences between eligible clients who were contacted versus those not contacted. Some of these differences are outlined in Figure 8 on page 69. The variables in red are statistically significant at the .05 level. Those in yellow represent the .10 level, and those in white were not significantly different in this sample.

The women who were contacted by the program were more likely to be single, non-Caucasian, older, have babies with lower birthweights or at an earlier gestational age, and have fewer prenatal visits (or none at all). In short, the women who were at higher risk for future poor pregnancy outcomes were more likely to be contacted by the IHPI program.

In sum, a substantial majority (about 75%) of the pregnancies and deliveries with the specific problems that were targeted by the IHPI program were eligible for the IHPI program. Those not eligible were primarily ineligible due to tubal ligations and multiple

Figure 7

AVERAGE PERCENTAGE OF LBW BIRTHS AT DHHA AND PROGRAM PENETRATION

PROGRAM START UP

1995 | 1996 | 1997 | 1998

PROGRAM STATUS
■ % LBW   ■ % ELIGIBLE   ■ % CONTACTED   ■ % ENROLLED

births -- not criteria the program can change. Of those eligible for the program, about half (46%) were contacted by the program regarding the IHPI services. Those contacted tended to be women who were at higher risk for future poor pregnancy outcomes.

Of the women who were contacted by the program, a little more than half (55%)

agreed to participate in the program's services. Another way to look at it is that about one out of five (21%) of the women who were eligible to participate in the IHPI program actually participated in it. For more detailed information, please see Tables G and H in the Appendix starting on page 164.

Figure 8

COMPARISON OF IHPI ELIGIBLE WOMEN CONTACTED VERSUS NOT CONTACTED

	CONTACTED		NOT CONTACTED		
	# [or mean]	% [or S.D.]	# [or mean]	% [or S.D.]	p value
not married	219	78.8%	121	65.5%	0.001
born in USA	180	64.7%	85	45.9%	0.000
age	[24.2 years]	[6.3]	[22.7 years]	[5.1]	0.006
causacian	222	79.9%	162	87.6%	0.006
hispanic	184	66.2%	149	80.5%	0.001
high school graduate	66	23.8%	55	29.7%	0.179
received prenatal care	242	87.4%	169	92.3%	0.090
previous LBW baby	52	19.5%	30	16.5%	0.420
gestational age at birth	[34.4 weeks]	[3.9]	[36.2 weeks]	[2.9]	0.000
gestational age at intake	[16.0 weeks]	[13.4]	[16.5 weeks]	[7.8]	0.650
number of visits	[5.8 visits]	[4.2]	[7.3 visits]	[4.0]	0.000
birthweight	[4.4 pounds]	[1.0]	[4.9 pounds]	[0.8]	0.000

Program Participant Analysis

"Are certain types of women more likely than others to agree to participate in the IHPI program?"

In this section, cases are included if they were eligible for the IHPI program and were contacted regarding program participation.

As seen in Figure 2 on page 62, the majority of women (53%) who were contacted regarding participation in the IHPI program agreed to participate. The month-by-month numbers are presented in Table E on page 162 in the Appendix, but there are several variables that are predictive of whether contacted women agreed to participate in the IHPI program. A series of logistic regressions was performed to determine the most important variables and the results are summarized in the next few graphs. More complete results are available in Tables I and J in the Appendix, beginning on page 166.

By far, the single most important variable predicting participation in the IHPI program was the type of contact that was first made with the woman. This variable is summarized in the first graph in Figure 9 (at the top of page 72). It shows that two out of three women receiving a face-to-face contact agreed to participate in the program. Conversely, of those not receiving a face-to-face contact, two out of three women declined to participate in the program.

There were several other important predictors of program participation, although these were not nearly as strong as the type of initial contact. Many of the other variables are highly related to the type of initial contact and are, in fact, a proxy for the type of contact. For example, while time in the Neonatal Intensive Care Unit (NICU) is predictive of participation, it is not nearly as predictive if the type of contact is controlled for first. These two variables are very much inter-related since a woman is much more likely to have a face-to-face contact if the infant is in the NICU. Controlling for the type of contact significantly decreases the predictability of the NICU variable, and several other variables, by themselves.

There are other variables that are more important predictors of participation when combined with the type of contact, but only for certain subsets of women. This is demonstrated in the remaining graphs in Figure 9.

Among women who did not have a face-to-face contact (see the graphs on the right-hand side of Figure 9), women born in the USA were much less likely to participate in the program (21%) than those not born in the USA (50%). However, among women who had a face-to-face contact (see the left-hand side of Figure 9), the country of origin is not significantly related to program participation. Instead, for these cases, the weight of their baby at delivery is more important. Women with the lowest birthweight babies were more likely to participate (79% vs 63%) than those with heavier, low birthweight babies.

The final graphs in Figure 9 demonstrate other variables that are

predictive of participation for specific subgroups of women. As noted above, women without a face-to-face contact had a lower participation rate overall, but varying with where the mother was born. Among women born outside of the USA, participation varied greatly according to the gestational age of the child at birth. Women with babies born after 36 weeks had much lower participation rates than women with earlier gestation newborns.

The most highly predictive variables are summarized in Figure 10 on page 74. The graph clearly demonstrates that in most subgroups of women, the participation rate more than doubled with a face-to-face contact (represented by the solid lines). In some groups, the difference was even more dramatic. For example, the acceptance rate for women born in the USA with very low birthweight babies increases from 8% to 68% with a face-to-face contact.

The other important factors predicting a woman's participation are:

- **Age** -- the program participants tended to be somewhat older than the non-participants.
- **Hispanic, Spanish-speaking & born in the USA** -- women not born in the US, women who spoke Spanish and women who are Hispanic were more likely to participate.
- **Previous fetal demise** -- there were not many women who had a previous fetal demise, but those that did were much more likely to become an IHPI client.
- **Birthweight & gestational age** -- the lower the birthweight and the shorter the gestation of the newborn, the more likely the mother would participate.

- **NICU & total length of stay** -- length of stay in the hospital and an admission to the Neonatal Intensive Care Unit were both predictive of program acceptance.
- **Smoking & drug/alcohol use** -- users of tobacco, alcohol or drugs during the pregnancy were less likely to become involved.

Many of these variables group into inter-related clusters. For example, birthweight, gestational age, and length of stay in the hospital are all highly related to each other. A low birthweight baby is typically born at an earlier gestational age and more likely to spend extra time in the hospital after the birth.

Another cluster is the amount and type of experience that the mother has had with childbirth. This factor is labeled "birth experiences," and includes the number and severity of complications that the woman had with the current pregnancy, as well as the number and type of complications she has had with any previous births. Specifically, these variables are:

- Whether this is the woman's first pregnancy
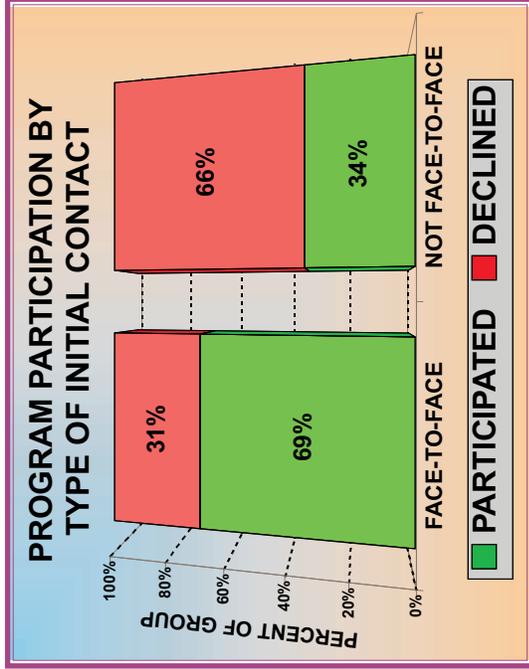- Which trimester prenatal care was begun for the current pregnancy
- Whether a C-section was performed during this birth
- Whether the current baby spent time in the NICU
- Whether the women experienced any previous fetal demises
- Whether the women experienced any previous low birthweight babies

While these variables can be looked at individually, they are examined here as a
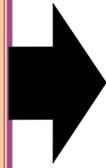
Figure 9

PROGRAM PARTICIPATION BY TYPE OF INITIAL CONTACT

PERCENT OF GROUP

- FACE-TO-FACE: 31% / 69%
- NOT FACE-TO-FACE: 66% / 34%

■ PARTICIPATED ■ DECLINED

Women who did not receive a face-to-face contact were much less likely to participate in the program, but this varied with where the woman was born.

PROGRAM PARTICIPATION WITHOUT FACE-TO-FACE CONTACT

PERCENT OF GROUP

- BORN IN USA: 79% / 21%
- NOT BORN IN USA: 50% / 50%

MOTHER'S COUNTRY OF BIRTH
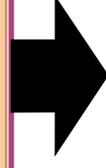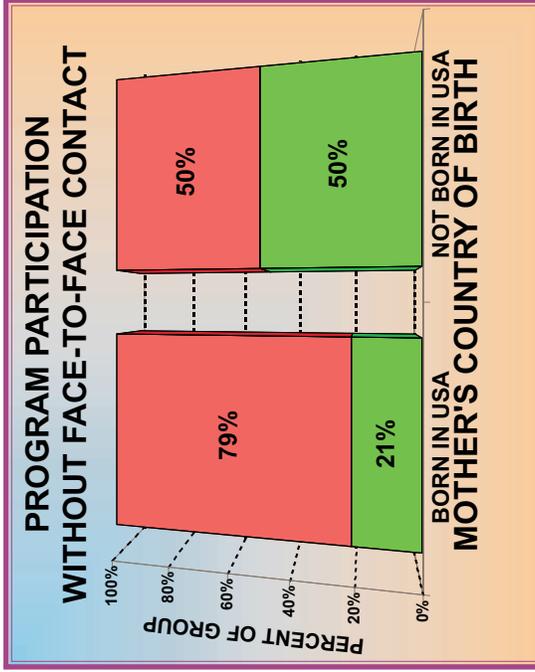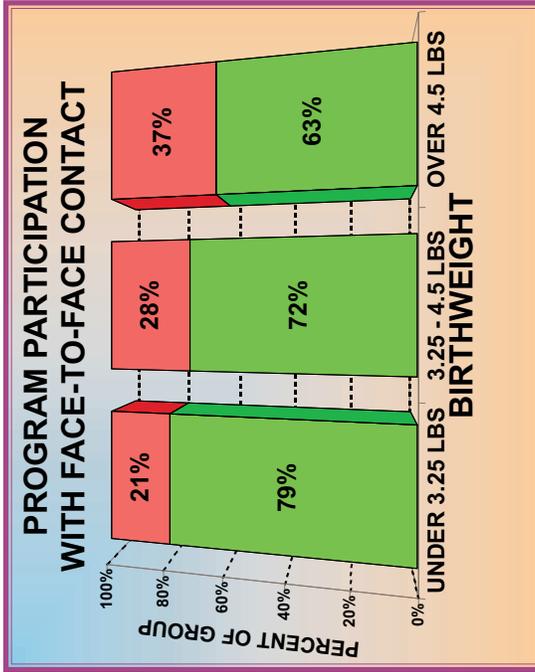
Women receiving a face-to-face contact were much more likely to participate in the program, but this varied with the weight of the baby.

PROGRAM PARTICIPATION WITH FACE-TO-FACE CONTACT

PERCENT OF GROUP

- UNDER 3.25 LBS: 21% / 79%
- 3.25 - 4.5 LBS: 28% / 72%
- OVER 4.5 LBS: 37% / 63%

BIRTHWEIGHT

72

PROGRAM PARTICIPATION
NO FTF CONTACT & NOT BORN IN USA

PERCENT OF GROUP

	UNDER 26 WEEKS	26-35 WEEKS	OVER 36 WEEKS
Declined	33%	38%	73%
Participated	67%	62%	27%

GESTATIONAL AGE AT BIRTH

■ PARTICIPATED ■ DECLINED

Women without a face-to-face contact and not born in the USA were much less likely to participate if the child was close to full-term.

Women with a face-to-face contact and the heaviest low birthweight babies were more likely to participate if the child was in the NICU for more than one week.

For mothers born in the USA, there were no additional predictive variables.

PROGRAM PARTICIPATION
FTF CONTACT & HEAVIER WEIGHT BABIES

PERCENT OF GROUP

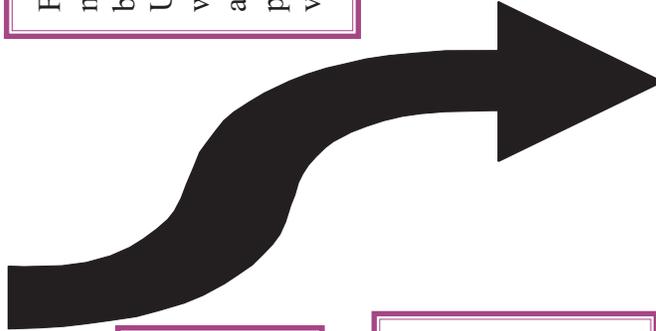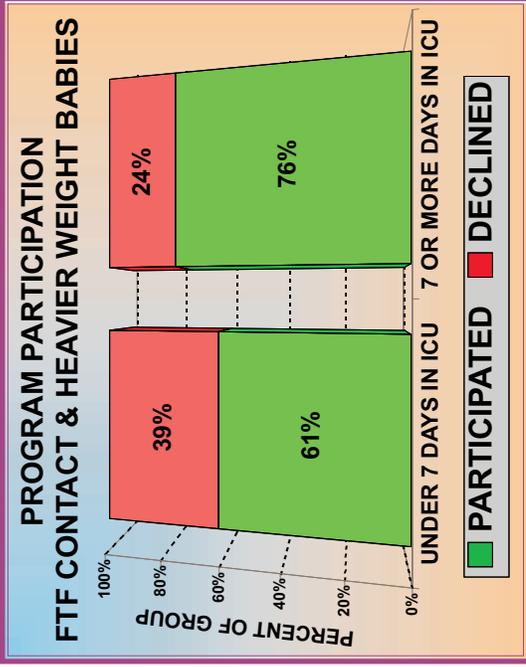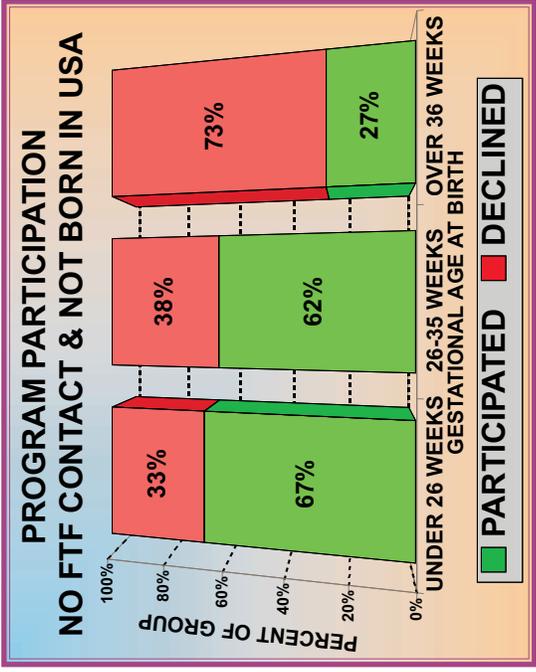|	UNDER 7 DAYS IN ICU	7 OR MORE DAYS IN ICU
Declined	39%	24%
Participated	61%	76%

■ PARTICIPATED ■ DECLINED

For women with medium low birth weight babies, there were no additional predictive variables.

Women with a face-to-face contact and the lowest weight babies had a high participation rate, but this varied with where the woman was born.
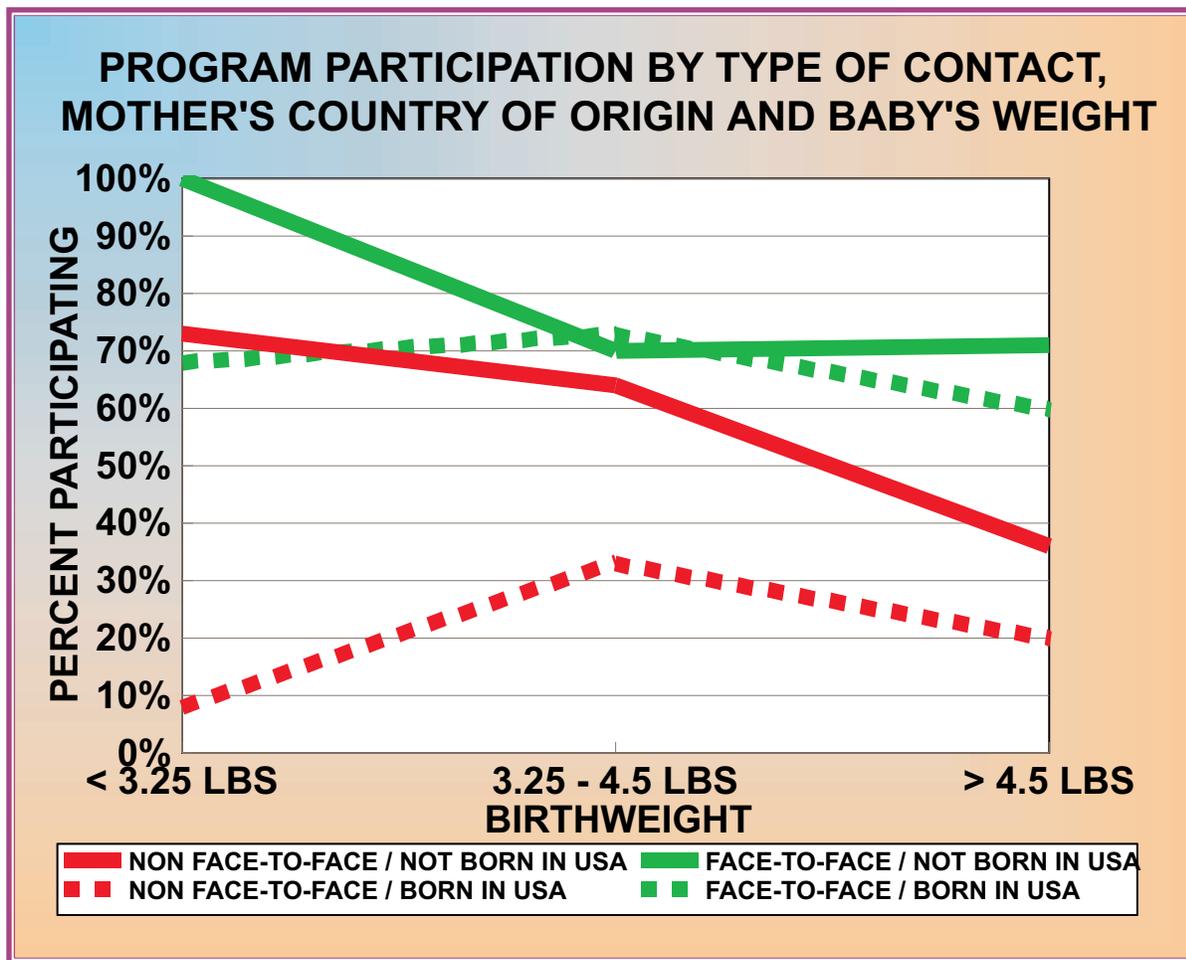
PROGRAM PARTICIPATION
FTF CONTACT & LOWEST WEIGHT BABIES

PERCENT OF GROUP

	BORN IN USA	NOT BORN IN USA
Declined	32%	
Participated	68%	100%

■ PARTICIPATED ■ DECLINED

73

Figure 10

PROGRAM PARTICIPATION BY TYPE OF CONTACT, MOTHER'S COUNTRY OF ORIGIN AND BABY'S WEIGHT

cluster of variables which, in this instance, increases their predictive power. The simplest way to summarize these variables is just to add them together without weighting them or adjusting for relative importance. In this comparison, women with more negative birth experiences -- either for themselves or the child -- are more likely to participate in the IHPI program. This is summarized in the first graph in Figure 11 on page 75. The redder the cell in the graph, the lower the participation rate, while the greener the cell, the higher the participation rate. This clearly shows that the heavier the birthweight of the baby, the less likely the mother is to participate in the

program. In addition, the fewer negative birth experiences (past and present) that the woman has had, the less likely the woman is to become involved in the IHPI.

When the type of initial contact is added to this mix of variables, the differences in program participation became even more dramatic. In the bottom pair of graphs in Figure 11, we see that women who did not have a face-to-face contact had, overall, a much lower participation rate, but this improved dramatically as the number of negative birth experiences increased. Conversely, women who had a face-to-face contact had a much higher participation rate,

Figure 11

PROGRAM PARTICIPATION BY BIRTHWEIGHT AND BIRTH EXPERIENCE

		WEIGHT AT BIRTH	
	< 3.25 LBS	3.25 - 4.5 LBS	> 4.5 LBS
TOTAL NUMBER OF NEGATIVE BIRTH EXPERIENCES — NONE	50%	75%	32%
1 OR 2	58%	63%	44%
> 2	80%	69%	80%

■ HIGHEST ACCEPTANCE   ■ LOWEST ACCEPTANCE

WITHOUT FACE-TO-FACE CONTACT

		WEIGHT AT BIRTH	
	< 3.25 LBS	3.25 - 4.5 LBS	> 4.5 LBS
TOTAL NUMBER OF NEGATIVE BIRTH EXPERIENCES — NONE	0%	THERE WERE NO WOMEN IN THIS CATEGORY	8%
1 OR 2	38%	55%	25%
> 2	60%	38%	56%

■ HIGHEST ACCEPTANCE   ■ LOWEST ACCEPTANCE

Women without a face-to-face contact had lower participation rates, but this improved as the number of negative birth experiences increased.
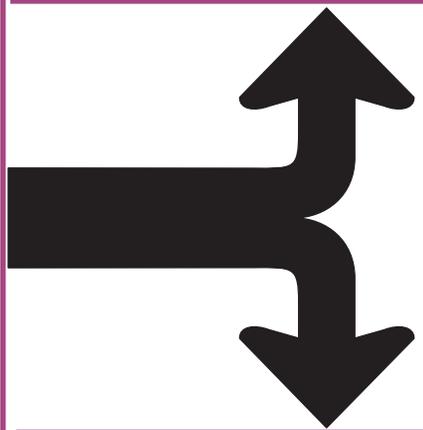
WITH FACE-TO-FACE CONTACT

		WEIGHT AT BIRTH	
	< 3.25 LBS	3.25 - 4.5 LBS	> 4.5 LBS
TOTAL NUMBER OF NEGATIVE BIRTH EXPERIENCES — NONE	100%	75%	54%
1 OR 2	69%	68%	57%
> 2	86%	74%	88%

■ HIGHEST ACCEPTANCE   ■ LOWEST ACCEPTANCE

Women with a face-to-face contact had higher participation rates, but this dropped as the weight of the child increased.

but this dropped significantly as the weight of the newborn increased.

These subgroups, based on the weight of the baby, the mother's birth experiences, and the type of contact, demonstrate the importance of looking at the IHPI women in subgroups. Many important differences are masked if the population such as this is looked at as a whole or if variables simply are looked at individually. There are undoubtedly many other "hidden" subgroups of women that might hold other clues as to IHPI program participation. But with the information we have, the following conclusions can be drawn.

The majority of the qualified, eligible, contacted women are willing to participate in the IHPI program (53%). By far, the most important factor in determining IHPI participation is having a face-to-face contact between the mother and an IHPI case manager. This is especially true for women who were born in the USA, and also for women with fewer negative pregnancy experiences and outcomes (either in this birth or in previous pregnancies).

Use of Services

"What types of services do the IHPI clients use while in the program?"

"Do the services used by the IHPI participants vary from woman to woman?"

"What types of changes do the program participants make while in the program and are these related to the services received?"

This section includes clients who participated in the IHPI program between December, 1995 and October, 1999. This assures that they were in the program long enough to have a reasonable number of encounters for evaluation purposes.

Once a woman agreed to participate in the IHPI program a new phase in the data collection process was begun. During the first meeting, an Intake form was completed. Two additional forms were used to collect data at approximately six months and 12 months. These forms were both similar to the Intake form. The 12 months form was also used as an Exit form if the woman completed the program before the end of the 12-month period. (Samples of the surveys are included in the Appendix, beginning on page 132)

There were 209 IHPI participants who met all of the study criteria and had complete data included in this section. For more complete details see Tables K and L on page 168 in the Appendix. Figure 12shows the number of months that these participants remained in the program, i.e received services (green line). Because not all clients enrolled in later years had had enough time to complete the program, the graph also includes cases that entered the program before 1997 to give a more complete picture of program services for fully-completed cases (red line). The average client received services for 13 months when the median is based on the pre-1997 clients. There is a large amount of variation in the amount of time clients spend in the program. A few clients received services for a very short period of time, while a few others continued to stay in touch with their case managers for over two years.

The next few graphs describe the services these clients received in the program. The cases used in these graphs include all of the cases listed above. Because they include women who had not finished the program, they may underestimate the total services that will be used by the average client. Figure 12shows that the typical client from 1996 was in the program a few months longer than the entire pool of clients. This means that the actual amount of services used likely will be slightly higher than those listed in the next series of graphs. However the data displayed still give a good estimate of the types, amounts, and proportions of services that the average client uses.

Figure 12

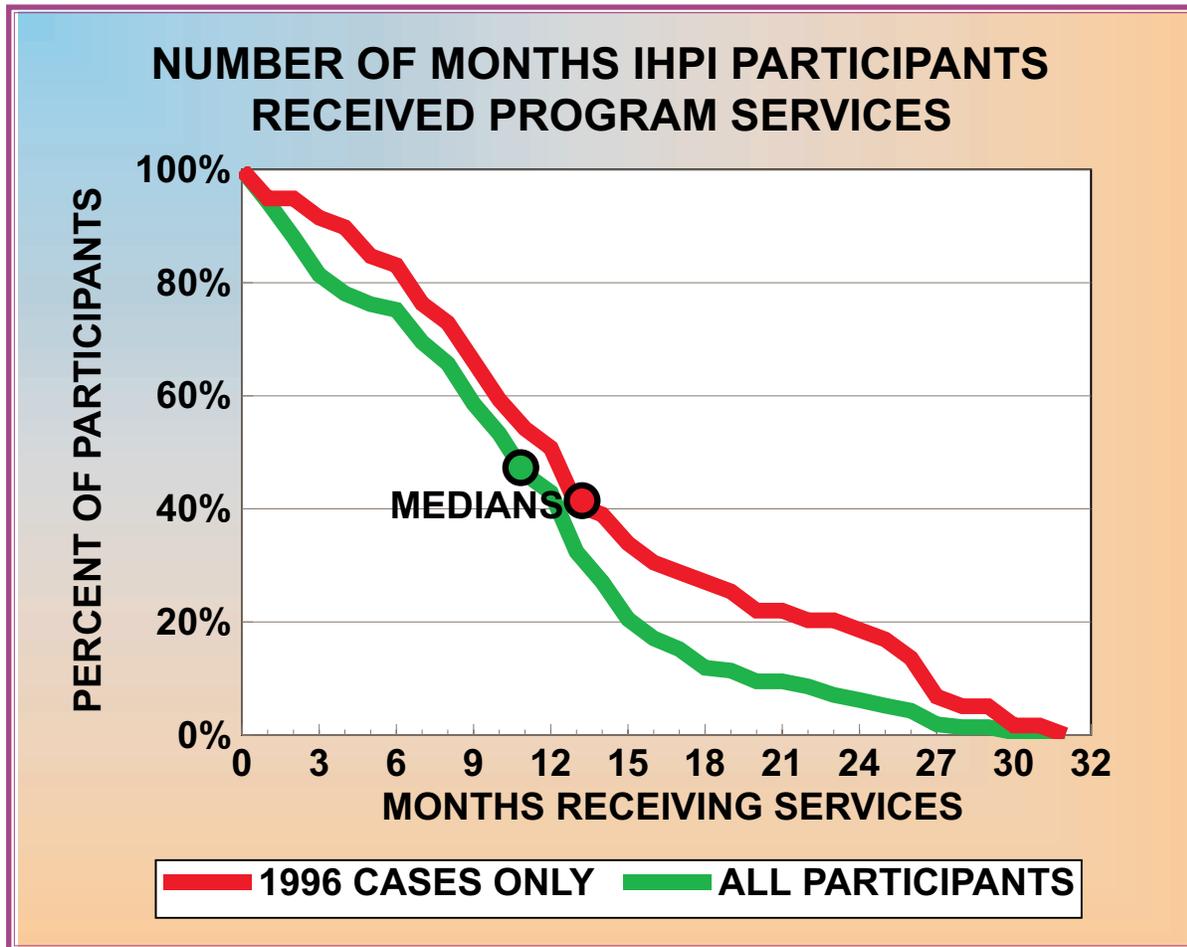NUMBER OF MONTHS IHPI PARTICIPANTS RECEIVED PROGRAM SERVICES

Figure 13 (on page 79) summarizes the number of encounters that clients have with the case managers, as well as the total amount of time the case managers spend with the clients. In this chart, the center line represents the median value of the group, while the outer-edges of the notched areas mark the 25th and 75th percentiles, the outer-edges of the boxes mark the 10th and 90th percentiles, and the "whiskers" mark the 5th and 95th percentiles. The average client had about nine meetings totaling to about nine hours. However, some clients met for over 25 hours, while others met for less than 5 hours (to date). There is quite a spread in the time usage of the population, with most clients have from five to 14 meetings while in the program.

The number of encounters with the clients varied considerably over time. As seen in Figure 14 on page 80, during the first month in the program, the average client has almost weekly meetings with the case manager. During the second month, the average number of meetings declines to an every-other-week contact, and after the second month, the typical contact is slightly less than one meeting a month. This level of contact then stays consistent throughout the remainder of the program.

Figure 13

NUMBER OF ENCOUNTERS AND TOTAL ENCOUNTER TIME FOR IHPI PARTICIPANTS
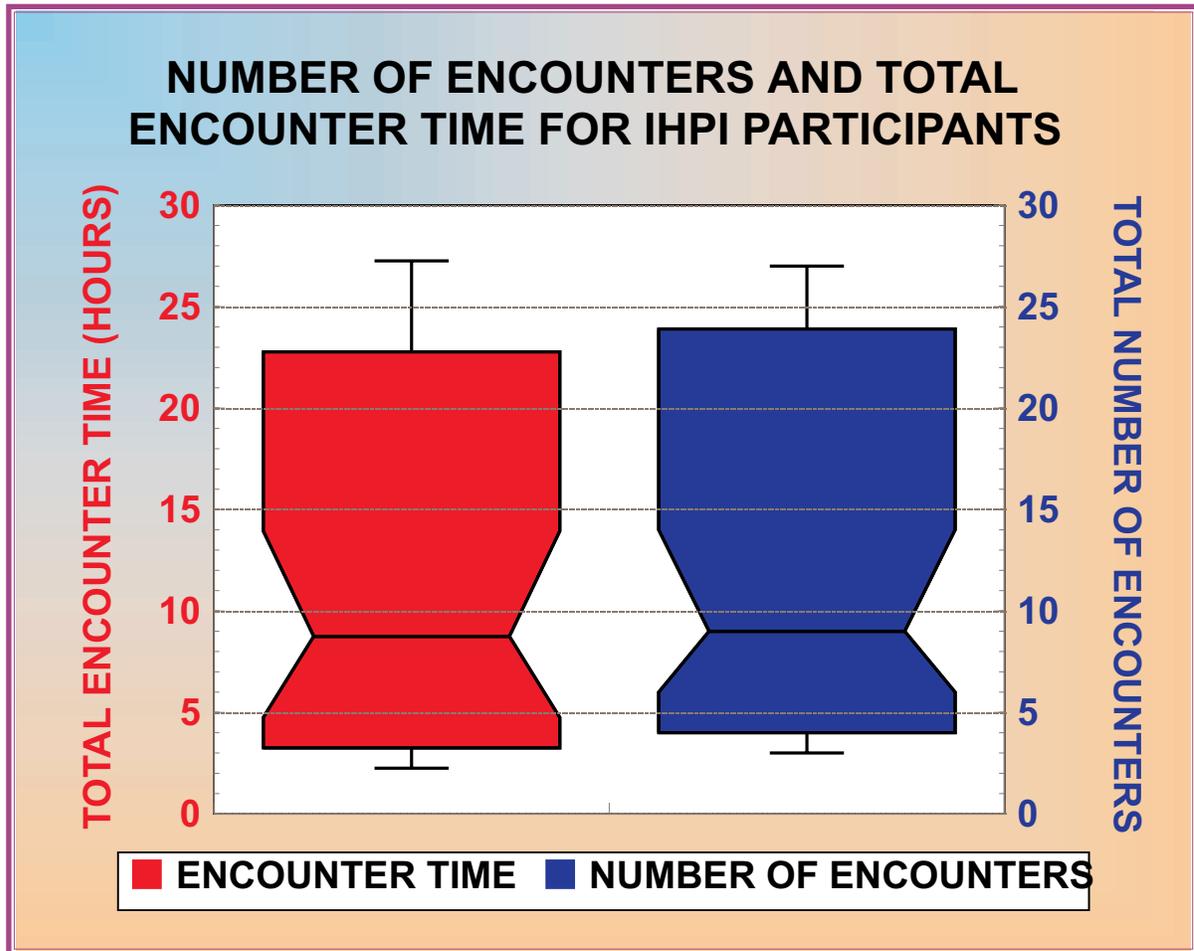
Figure 14 also shows that the average length of the encounters does not vary over time. From the first month to the 18th month in the program, the average meeting lasts just about an hour.

As described in the Program section of this report, there are several "service areas" or Domains that the program participants concentrate on while in the program. Briefly, there are:

- Family Planning -- issues relating to reproduction.

- Personal Health -- issues which would need evaluation by any health professional including nutrition, physical therapy, psychiatry, etc.

- Life Needs -- immediate survival needs, income issues, adequacy of current food, shelter, transportation, furniture, clothing etc.

- Lifestyle Behavior -- cigarette smoking, drug use, risky behaviors such as unsafe sex, and any habit or practice that undermines health.

- Relationships -- includes current partner, family, friends, ex-partner issues.

Figure 14

AVERAGE NUMBER OF ENCOUNTERS PER MONTH AND MEETING TIME BY PROGRAM MONTH
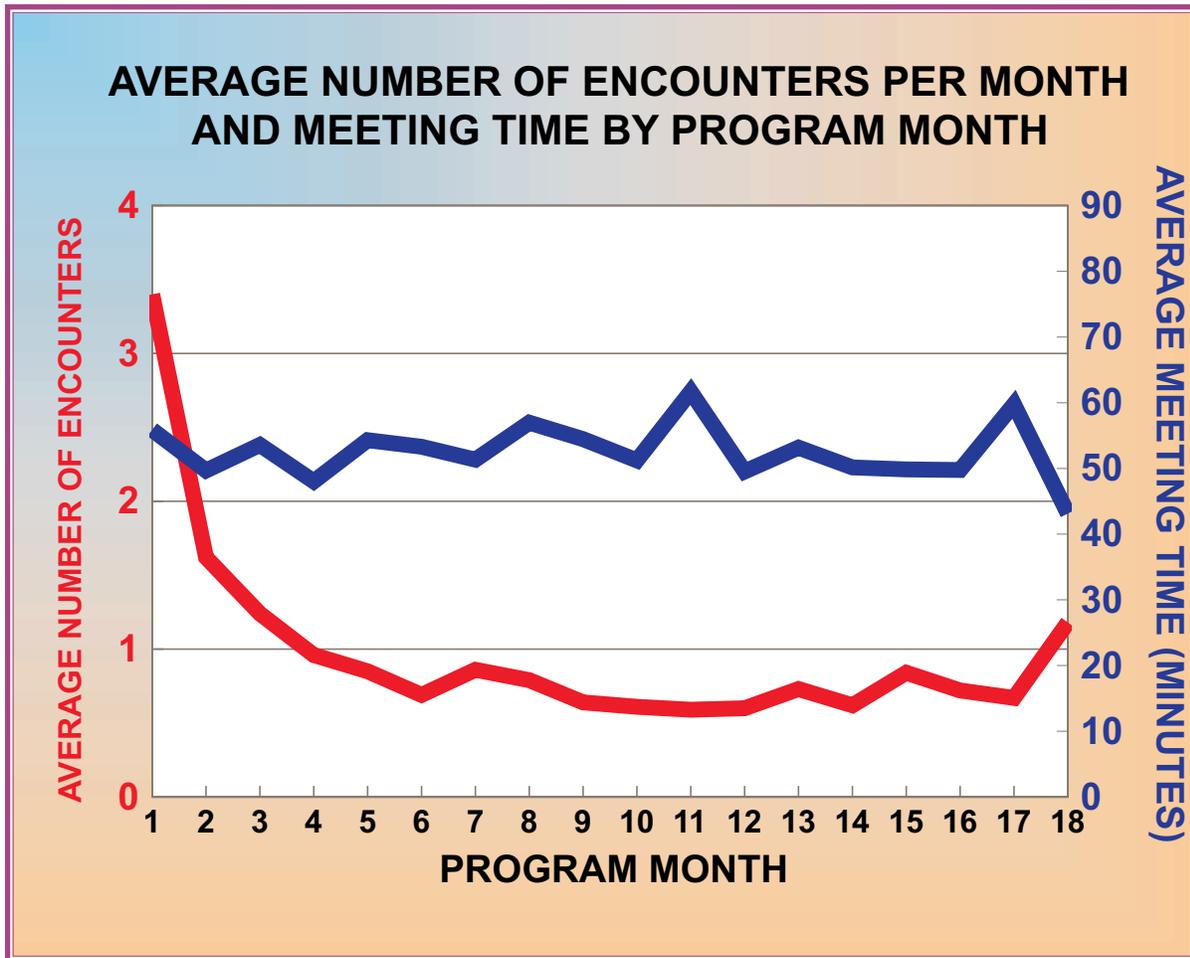
- Maternal Role -- issues regarding children, their needs, the parent/child relationship, and developmental concerns.

- Life Course -- issues of education, training, employment and future goals.

- Use of Services -- an extra Domain that was added into the program evaluation. It examines a woman's ability to navigate the myriad programs and services that are available to help her meet her various needs and the needs of her child.

The amount of time that the case managers and clients spend together on these areas is recorded on the IHPI encounter form (see the Encounter Form on page 157 in the Survey section of the Appendix). One form is completed by the case managers for each encounter with a client.

The overall results for each Domain are shown in Figure 15 on page 81. The three Domains with the highest use were Maternal Role, Personal Health, and Family Planning. Together, these three Domains account for 56% of the total time the case managers spent with the clients.

Figure 15

OVERALL SERVICE USE BY DOMAIN

- MATERNAL ROLE 21%
- LIFE COURSE 12%
- RELATIONSHIPS 10%
- USE OF SERVICES 8%
- LIFESTYLE 5%
- LIFE NEEDS 9%
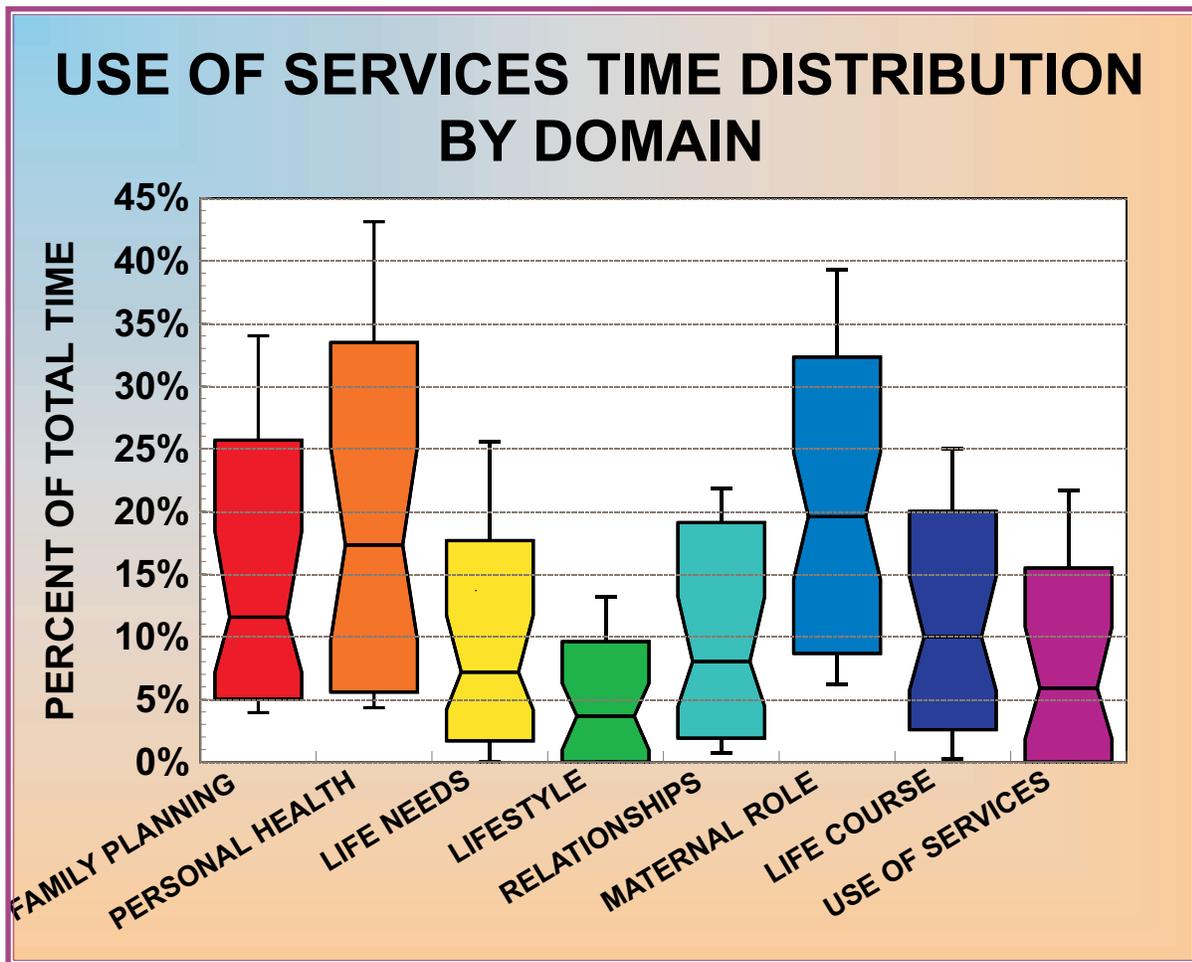- FAMILY PLANNING 15%
- PERSONAL HEALTH 20%
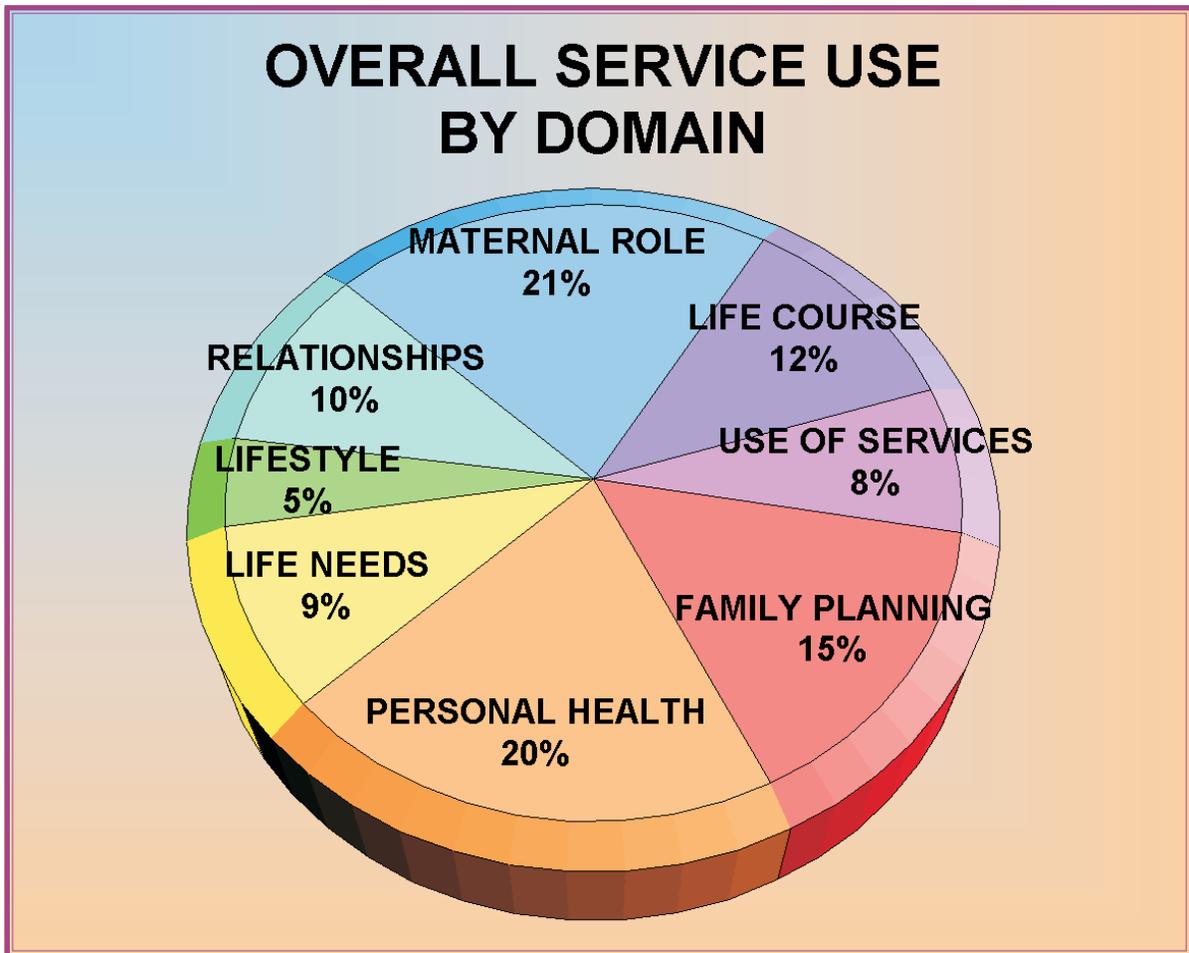
A distribution of the time spent in each of these Domains provides more insights than just the overall numbers. The distribution is shown in Figure 16 on Page 82. It indicates that there is a wide distribution in what services the IHPI clients use during the course of their involvement with the program. Take, for example, the Domain of Maternal Role. Although it is the Domain with the greatest amount of time overall, some clients spent about 5% of their total program time in this area, while other women were involved in this area for 40% of their total time. Some women used little or no time in certain Domains, which is consistent with the IHPI client-centered, needs-based approach.

Just as the proportions of services used varies from woman to woman, it also varies over time for each woman. By displaying the use of services in each Domains over time, we are able to determine if certain services tend to be used earlier on in the program, while others are more intensive later on. The results of this comparison appear in Figure 17 on page 83. In the first six months of the program, the top three Domains are Maternal Role, Personal Health, and Family Planning. But after the first six months there is more emphasis on

Figure 16

USE OF SERVICES TIME DISTRIBUTION BY DOMAIN

Personal Health which balloons to nearly 30% of the total encounter time. The top Domains during this period are Personal Health, Maternal Role, Life Course and Family Planning.

This graph also shows that some service areas are fairly stable over time. For example, Maternal Role constitutes about 20% of the encounter time throughout the program. Other Domains show periods of higher and lower activity. For example, Life Needs shows a peak around the 5 - 9 month period and Personal Health peaks around the 9 - 13 month period.

Not all of the IHPI clients need the same frequency, timing and duration of services. For example, a woman who is a first-time mother might need more time spent in the Maternal Role area, while a woman with a substance abuse problem might spend more time in the Lifestyle Domain. The next few graphs cover some of the questions in this area.

Client were evaluated by the case mangers during the IHPI program intake phase as to the number, type, and severity of risk in each of the eight Domains. The evaluations can be divided into three levels of risk for each of the Domains at the

Figure 17

PROPORTIONS OF ENCOUNTER TIME BY DOMAIN AND PROGRAM MONTH
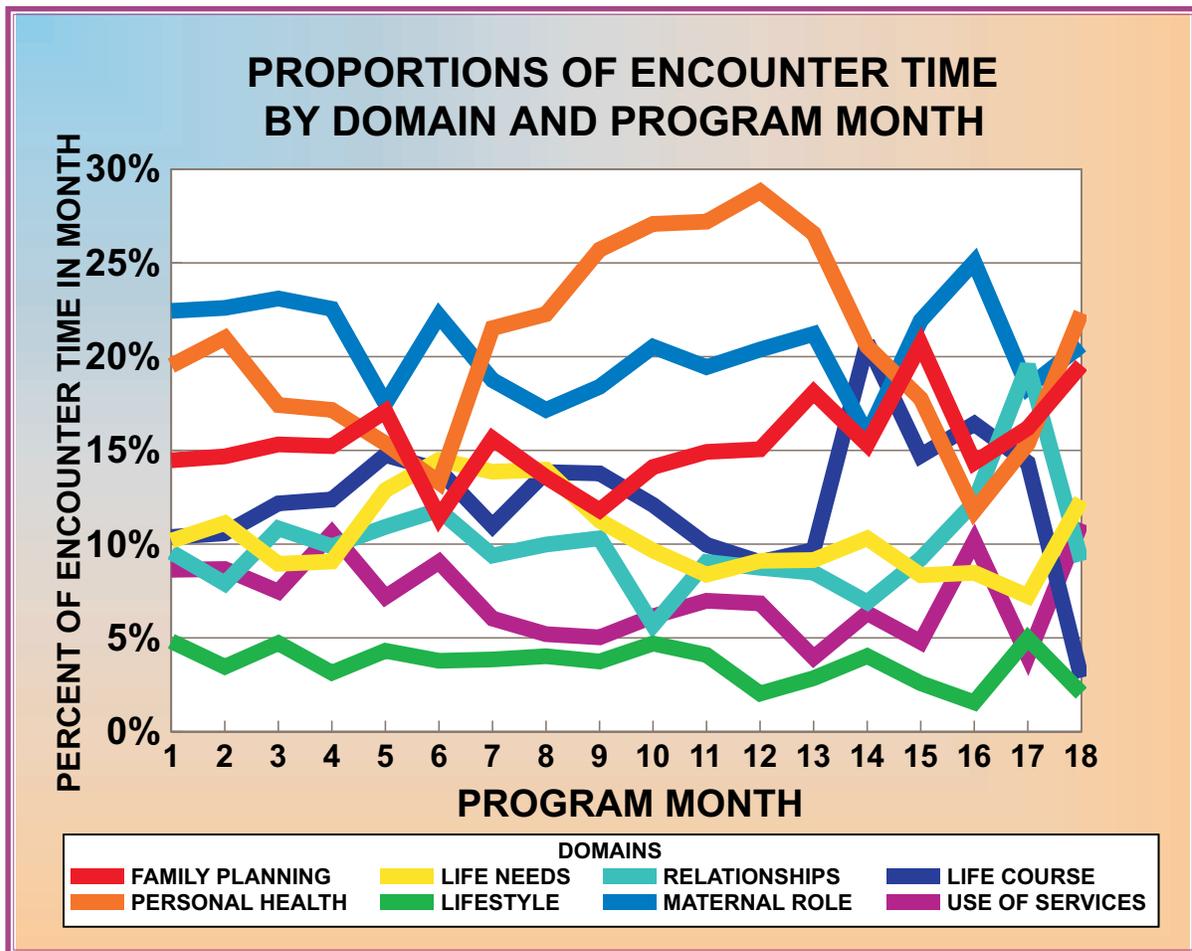
beginning of the program -- High, Medium, and Low. The nature of the client's program encounters were examined relative to this initial risk assessment. Then, using the information from the six and 12-month surveys, the risk levels were re-evaluated for any changes that occurred in the risk level.

The initial analysis in this area is an examination of the overall risk picture, covering all of the Domains (Figure 18 on page 84). During the first month, all of the clients, regardless of their overall risk level, spent approximately an equal amount of time with the case managers. But after the first month, the amount of time spent with the clients differs substantially. Women with the highest overall risk levels spend more time with the case managers (at least during the first nine months of the program) than the other IHPI clients.

The eight graphs in Figure 19 (starting on page 85) present the same analysis for each of the eight risk Domains. Each graph only examines the encounter time devoted to that particular Domain. As might be expected, the women with the highest initial risk levels in a specific Domain spent a greater proportion of their total time spent in that area, for example, Lifestyle Behavior risk. In other Domains, women with the

Figure 18

ENCOUNTER TIME BY OVERALL RISK LEVEL AND PROGRAM MONTH
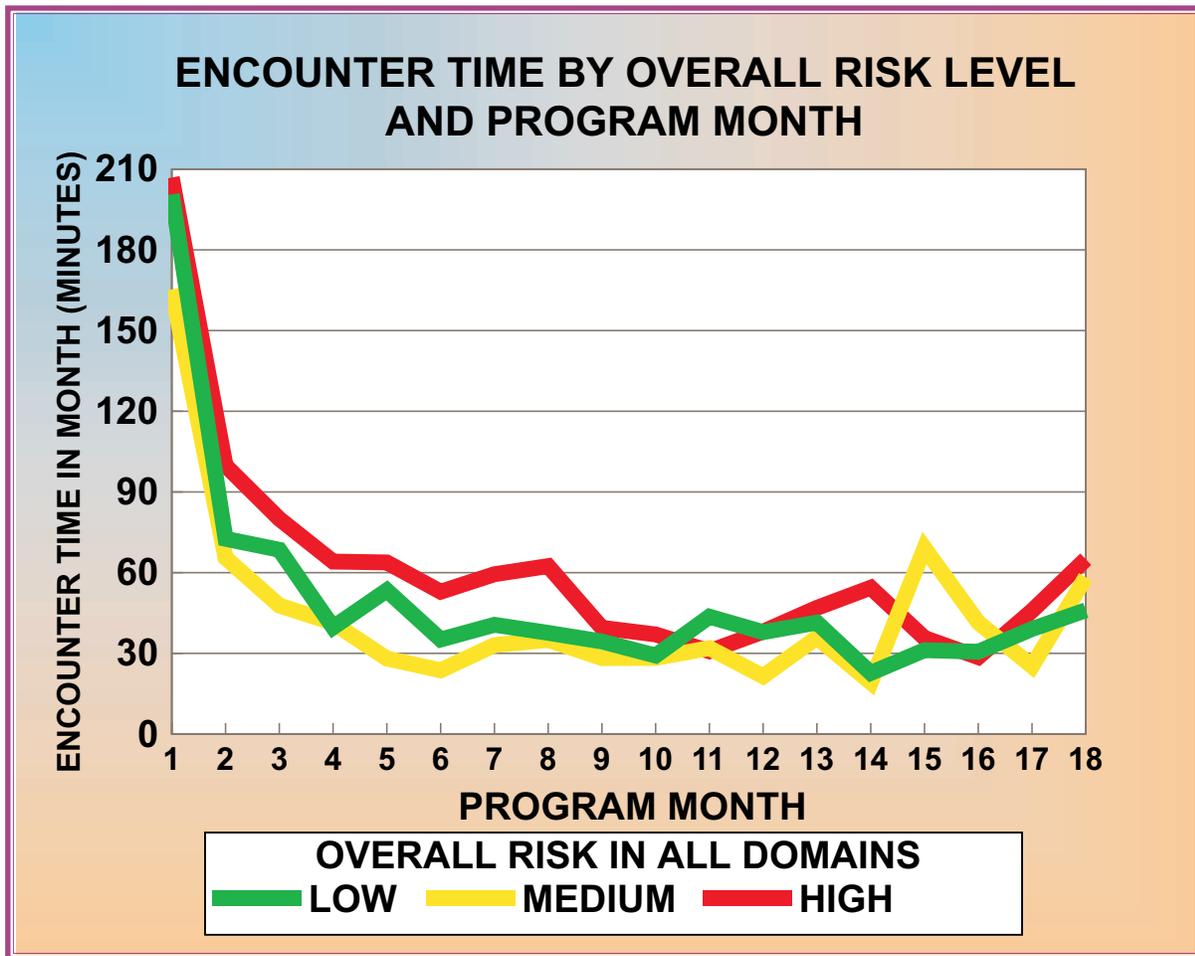
lowest risk stand out by having the lowest amount of time spent in that area. The Life Needs graph is a good example of this situation.

In the final series of analyses, the types and amounts of risk change were examined to determine if these changes are related to the amount and type of encounter time. As mentioned, the case managers completed up to three surveys on each woman in the IHPI program. The first was administered at the beginning of the program, the next at six months and another at 12 months. This allows us to examine changes in the risk levels of each Domain over time.

It must also be pointed out that among the risk factors predictive of a poor pregnancy outcome many are not changeable, or are changeable only to a very limited degree. For example, contrasting smoking and having a history of a previous fetal demise. While they are both predictive of future poor pregnancy outcomes, there is only one factor that a woman can do anything about. In the next few graphs these factors are split out according to whether the risk factor is changeable. The solid lines represent the total or overall risk rating, including changeable and non-changeable risk factors. The dotted lines are for the changeable risks only.

PERSONAL HEALTH ENCOUNTER TIME BY PERSONAL HEALTH RISK LEVEL AND PROGRAM MONTH

FAMILY PLANNING ENCOUNTER TIME BY FAMILY PLANNING RISK LEVEL AND PROGRAM MONTH

LIFESTYLE BEHAVIOR ENCOUNTER TIME BY LIFESTYLE BEHAVIOR RISK LEVEL & PROGRAM MONTH

LIFE NEEDS ENCOUNTER TIME BY LIFE NEEDS RISK LEVEL AND PROGRAM MONTH

Figure 19

85

MATERNAL ROLE ENCOUNTER TIME BY MATERNAL ROLE RISK LEVEL AND PROGRAM MONTH

MATERNAL ROLE RISK AT PROGAM INTAKE
LOW MEDIUM HIGH

% OF TOTAL ENCOUNTER TIME IN MONTH

PROGRAM MONTH

USE OF SERVICES ENCOUNTER TIME BY USE OF SERVICES RISK LEVEL AND PROGRAM MONTH

USE OF SERVICES RISK AT PROGAM INTAKE
LOW MEDIUM HIGH

% OF TOTAL ENCOUNTER TIME IN MONTH

PROGRAM MONTH

RELATIONSHIP ISSUE ENCOUNTER TIME BY RELATIONSHIP ISSUE RISK LEVEL & PROGRAM MONTH

RELATIONSHIP ISSUE RISK AT PROGAM INTAKE
LOW MEDIUM HIGH

% OF TOTAL ENCOUNTER TIME IN MONTH

PROGRAM MONTH

LIFE COURSE ENCOUNTER TIME BY LIFE COURSE RISK LEVEL AND PROGRAM MONTH

LIFE COURSE RISK AT PROGAM INTAKE
LOW MEDIUM HIGH

% OF TOTAL ENCOUNTER TIME IN MONTH

PROGRAM MONTH

Another important point is that the risk factors listed here are not weighted in any way; they are simply summarized. Some of these risks are much more likely to produce a future poor pregnancy outcome than others, but for the purposes of this report the risk factors are treated equally, and not adjusted according to their predictive importance. In short, a 10% decrease in the total number of risk factors here cannot be directly translated into a 10% reduction in the risk of another poor pregnancy outcome. Depending on which risk factors are changed, the actual probability could be substantially higher or lower than this.

Finally, only the women who completed all three surveys in the specified time-frame were examined for changes in their risk levels during the program.

The overall results for all of the Domains added together are in Figure 20 on page 88. Similar graphs for each of the eight Domains are in Figure 21 beginning on page 89. A few of the lines in some of the graphs are somewhat difficult to read. Some of the lines show little or no change over time, while others are so close that they are partially or completely covered up by other lines. And with some of the graphs, the population could only be broken into two categories at intake, either because there were only two possible risk levels or all of the cases fell into just two categories. In this instance, the "medium" category is not used and the cases are categorized into "low" and "high" risk categories only.

Overall, the graphs show a similar trend. Those women in the highest risk category at intake show a downward trend over time toward lower risk, while those in the lowest risk category show an increasing risk trend. This is true for both the overall

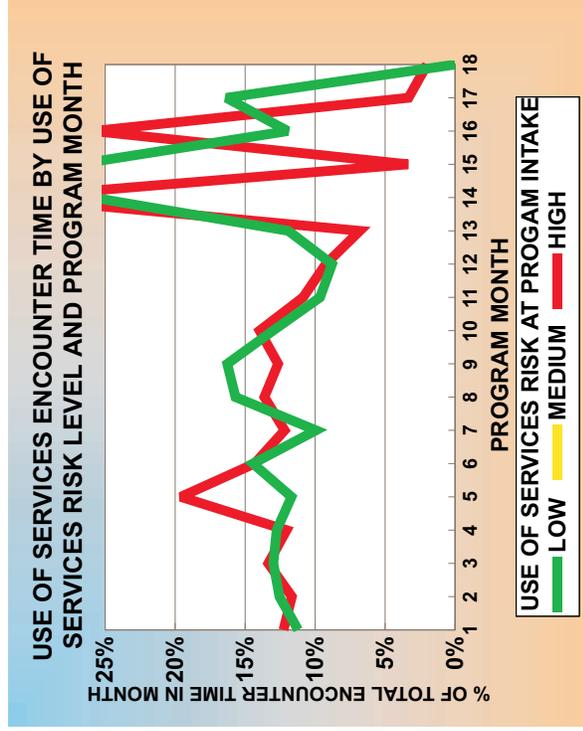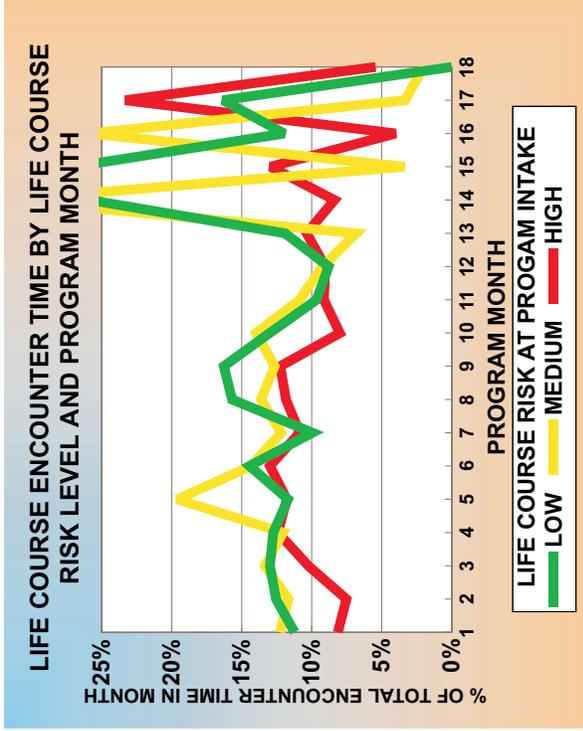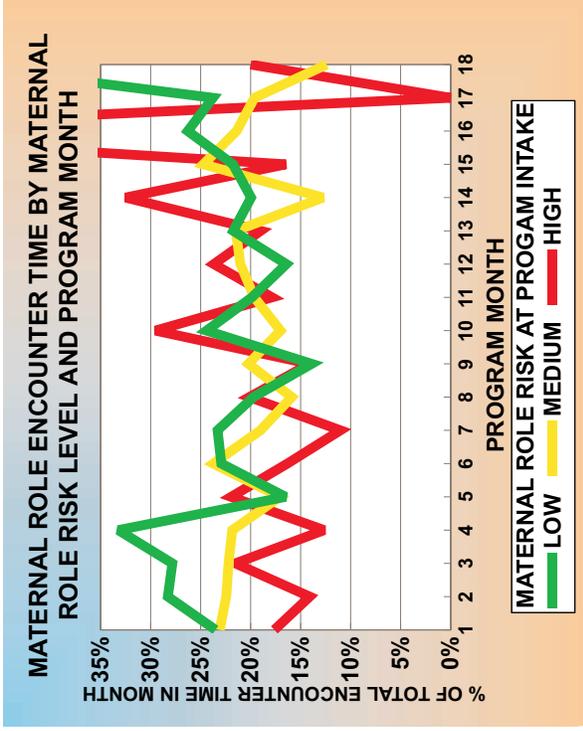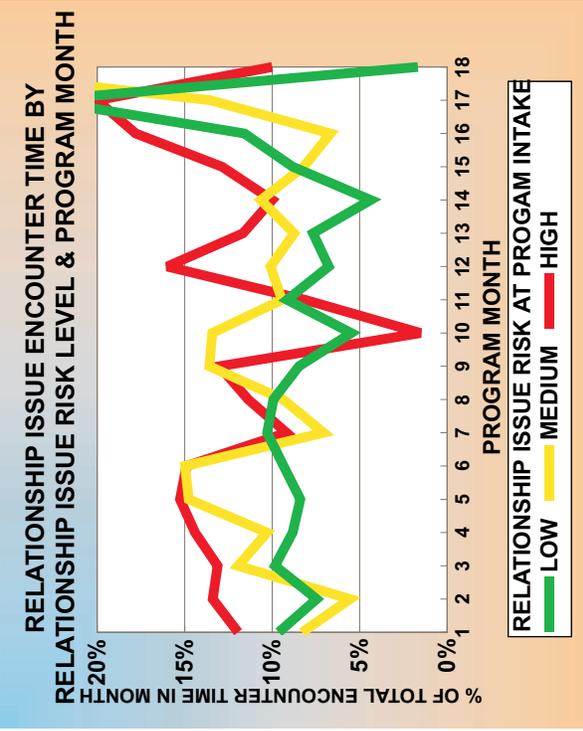(changeable plus non-changeable) risk level and for just the changeable risk ratings.

Without a control group with which to make comparisons, we cannot determine with confidence if any of these changes in risk level are likely due to program participation or other factors, such as maturation or regression toward the mean. Perhaps these changes were a result of participation in the IHPI program, but perhaps not.
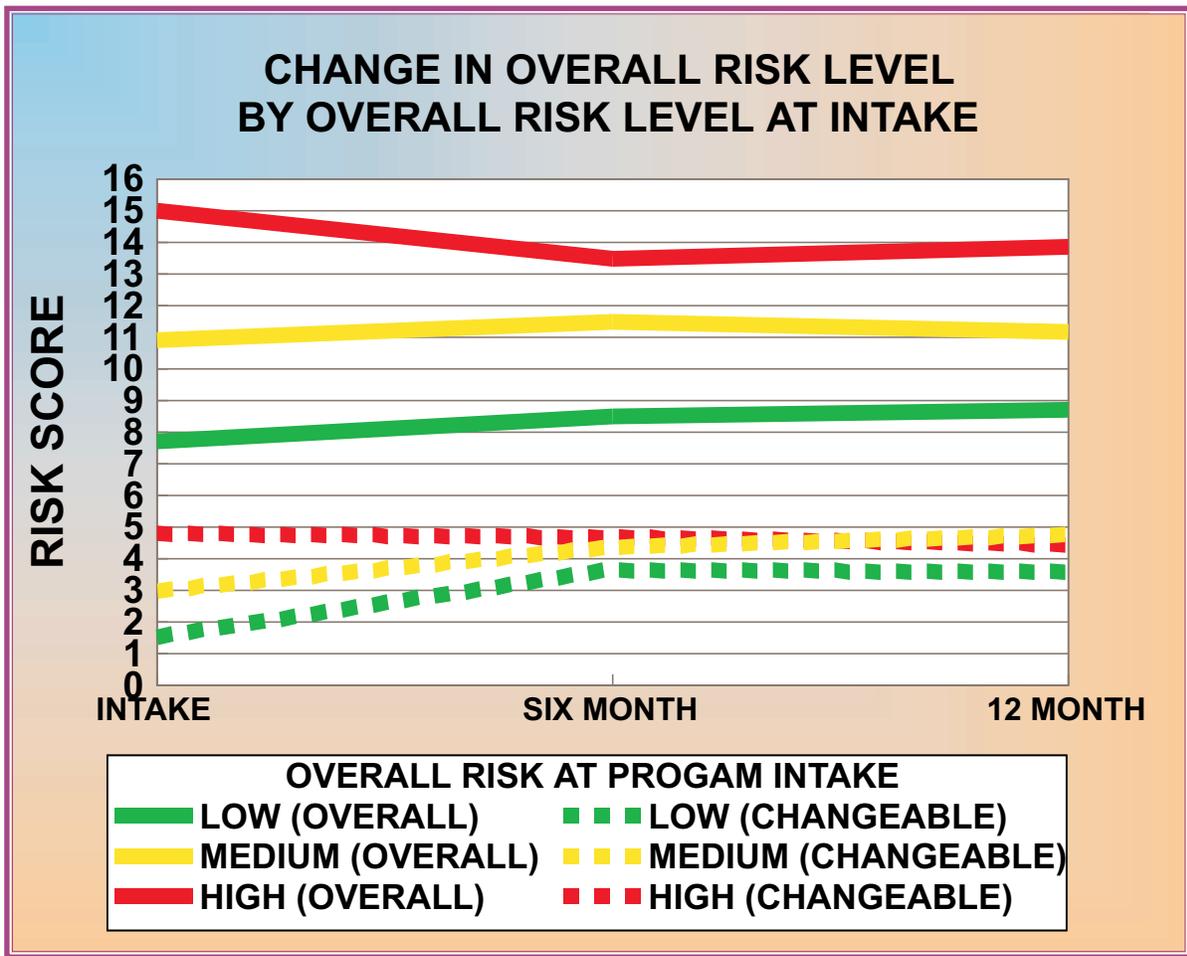
Just as in the previous section on Program Participation, there may be sub-groups of IHPI participants that show substantially different IHPI services-usage and risk-change patterns than those seen here. At this time, with only the small number of participants with complete information, we cannot break down the population any further and still have enough cases for a valid comparison.

In summary, there are some significant changes in the use of IHPI services by the participants over time. During the early stages of participation, there is close contact between the clients and the case managers, but this decreases over time. Most of the time is spent in the areas of Maternal Role, Personal Health, and Family Planning, with substantial variation over time and from woman to woman based on the risk level of the client at intake.

Changes in the risk levels of program participants during the program appear to depend considerably on the nature of the risks, as some risks are changeable, while others are not. Change in the changeable risk scores during the program is difficult to assess but appears to decline for the riskiest clients. It is difficult to accurately assess the changes in risk level due to the nature of self-reported risks. In addition, the small

Figure 20

CHANGE IN OVERALL RISK LEVEL BY OVERALL RISK LEVEL AT INTAKE

(Line chart: RISK SCORE (y-axis, 0–16) plotted across INTAKE, SIX MONTH, and 12 MONTH)

OVERALL RISK AT PROGAM INTAKE

- **LOW (OVERALL)** — green solid
- **LOW (CHANGEABLE)** — green dashed
- **MEDIUM (OVERALL)** — yellow solid
- **MEDIUM (CHANGEABLE)** — yellow dashed
- **HIGH (OVERALL)** — red solid
- **HIGH (CHANGEABLE)** — red dashed

sample size throws the generalizability of these results into question.

CHANGE IN PERSONAL HEALTH RISK LEVEL BY PERSONAL HEALTH RISK LEVEL AT INTAKE

PERSONAL HEALTH RISK AT PROGAM INTAKE
- LOW (OVERALL)
- LOW (CHANGEABLE)
- MEDIUM (OVERALL)
- MEDIUM (CHANGEABLE)
- HIGH (OVERALL)
- HIGH (CHANGEABLE)

CHANGE IN LIFESTYLE BEHAVIOR RISK LEVEL BY LIFESTYLE BEHAVIOR RISK LEVEL AT INTAKE

LIFESTYLE BEHAVIOR RISK AT PROGAM INTAKE
- LOW (OVERALL)
- LOW (CHANGEABLE)
- MEDIUM (OVERALL)
- MEDIUM (CHANGEABLE)
- HIGH (OVERALL)
- HIGH (CHANGEABLE)

Figure 21

CHANGE IN FAMILY PLANNING RISK LEVEL BY FAMILY PLANNING RISK LEVEL AT INTAKE

FAMILY PLANNING RISK AT PROGAM INTAKE
- LOW (OVERALL)
- LOW (CHANGEABLE)
- MEDIUM (OVERALL)
- MEDIUM (CHANGEABLE)
- HIGH (OVERALL)
- HIGH (CHANGEABLE)

CHANGE IN LIFE NEEDS RISK LEVEL BY LIFE NEEDS RISK LEVEL AT INTAKE

LIFE NEEDS RISK AT PROGAM INTAKE
- LOW (OVERALL)
- LOW (CHANGEABLE)
- MEDIUM (OVERALL)
- MEDIUM (CHANGEABLE)
- HIGH (OVERALL)
- HIGH (CHANGEABLE)

89

CHANGE IN RELATIONSHIP ISSUE RISK LEVEL
BY RELATIONSHIP ISSUE RISK LEVEL AT INTAKE

RISK SCORE

3
2
1
0

INTAKE — SIX MONTH — 12 MONTH

RELATIONSHIP ISSUE RISK AT PROGAM INTAKE
- LOW (OVERALL)
- MEDIUM (OVERALL)
- HIGH (OVERALL)
- LOW (CHANGEABLE)
- MEDIUM (CHANGEABLE)
- HIGH (CHANGEABLE)

CHANGE IN MATERNAL ROLE RISK LEVEL
BY MATERNAL ROLE RISK LEVEL AT INTAKE

RISK SCORE

2
1
0

INTAKE — SIX MONTH — 12 MONTH

MATERNAL ROLE RISK AT PROGAM INTAKE
- LOW (OVERALL)
- MEDIUM (OVERALL)
- HIGH (OVERALL)
- LOW (CHANGEABLE)
- MEDIUM (CHANGEABLE)
- HIGH (CHANGEABLE)

CHANGE IN LIFE COURSE RISK LEVEL
BY LIFE COURSE RISK LEVEL AT INTAKE

RISK SCORE

4
3
2
1
0

INTAKE — SIX MONTH — 12 MONTH

LIFE COURSE RISK AT PROGAM INTAKE
- LOW (OVERALL)
- MEDIUM (OVERALL)
- HIGH (OVERALL)
- LOW (CHANGEABLE)
- MEDIUM (CHANGEABLE)
- HIGH (CHANGEABLE)

CHANGE IN USE OF SERVICES RISK LEVEL
BY USE OF SERVICES RISK LEVEL AT INTAKE

RISK SCORE

1
0

INTAKE — SIX MONTH — 12 MONTH

USE OF SERVICES RISK AT PROGAM INTAKE
- LOW (OVERALL)
- MEDIUM (OVERALL)
- HIGH (OVERALL)
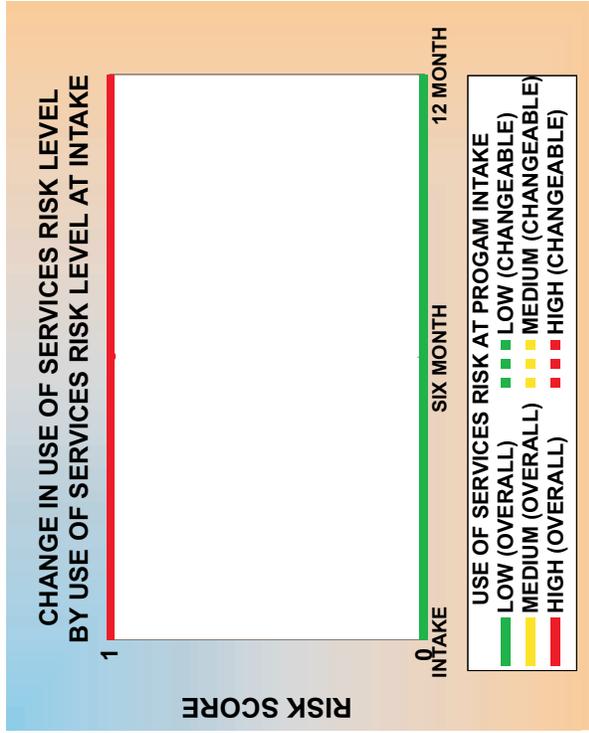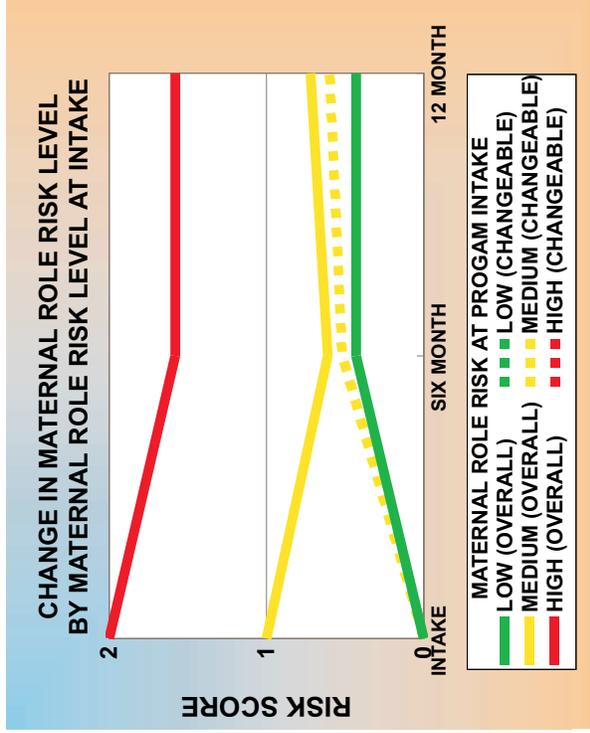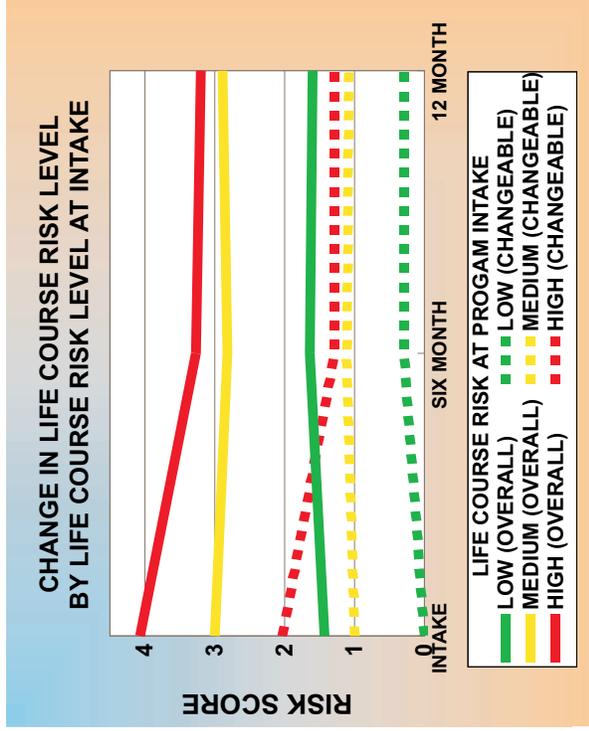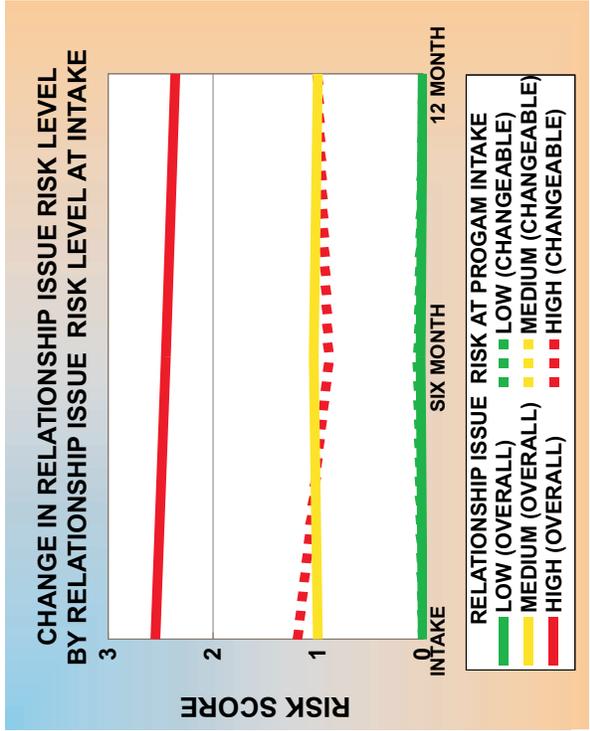- LOW (CHANGEABLE)
- MEDIUM (CHANGEABLE)
- HIGH (CHANGEABLE)

Program Completer Analysis

"Are women who complete the program more likely to comply with post-partum care and birth control use?"

"Are those who complete the program more likely to delay their next pregnancy?"

"Do program Completers have better outcomes in subsequent pregnancies than those who declined to participate in the program?"

This section includes clients who completed at least six months in the IHPI program, or were eligible for the program but declined to participate, and who delivered before October, 1998, as to allow enough time for a follow-up period.

As seen in Figure 2 on page 62, there were 162 women who completed at least six months in the IHPI program during the study period. These clients were followed for up to 40 months after leaving the program to determine the longer-term effects of the intervention. In order to determine the program's impact on future pregnancies and other outcomes, this group was compared to a similar group of women who did not receive the program's services.

The question of which group of women to compare the IHPI Completers to is an important one. The IHPI participants constitute a unique group of women.

- First, they have all had very unfortunate pregnancy outcomes.

- Second, they were selected by the IHPI case managers as very likely to have another negative pregnancy outcome if they became pregnant again.

- Third, they expressed a desire for another child.

- Fourth, they agreed to participate in the program.

Because the IHPI was a demonstration project, there was no strict control group for comparison purposes. Lacking this, it is necessary to identify a comparison group of women with as many similarities as possible -- women who have had similar pregnancy outcomes; are likely to have another poor outcome; are likely to become pregnant again; and are motivated enough to participate in a program of this type.

The easiest potential comparison group to identify were women who were eligible for the program but chose not to participate during the same time period. These "Decliners" qualified for the program and met all of the program's eligibility requirements. By comparing the post-partum care and future pregnancy outcomes of the two groups, valuable insights into the usefulness of the IHPI program could be gathered. But as shown in the Program Participation section (see page

70), there are some important differences between the Completers and the Decliners. Briefly, those who participated in the program had babies with significantly worse outcomes, while those who declined to participate were mothers with significantly more social and behavioral problems. Therefore, the original comparison group is substantially different from the treatment group and is not as good a comparison as hoped. To remedy this situation, the Colorado Trust provided additional funds in an effort to obtain a better comparison group.

As described in the Program Penetration section, there were many more eligible women than space in the IHPI program. (These cases are shown as the blue area in Figure 6 on page 67.) It was thought that these women could provide a better comparison group than the program Decliners, as they had not been self-selected by the IHPI recruitment process.

To determine which births would constitute the new comparison cases, we reviewed low weight births from 1995 through mid-1998, to determine program eligibility. Cases meeting all of the IHPI eligibility requirements and with no contact with the program were the comparison group. The sample size figures are summarized in Figure 22 for each year from 1995 through mid-1998. It shows that nearly 800 low birthweight cases from the beginning of 1995 to the middle of 1998 were reviewed. Of these, 600 (75%) met all the IHPI criteria and were eligible to participate in the program. Of the eligible cases, there were 338 that did not have any contact with the IHPI program and were therefore included in this new comparison group.

For consistency and quality assurance purposes, all of the medical records for the comparison cases were reviewed by a single RN with a Master's degree in Maternal and Fetal Health. For the index birth, the same variables were collected on the comparison cases as had previously been collected for the project participants and Decliners. For subsequent births, since women could deliver at other hospitals, birth certificate records were collected.

When performing the analysis using this new comparison group, two major problem areas arose:

- the new comparison group is even more different from the IHPI participants than the IHPI Decliner comparison group

- the birth certificate data on subsequent birth outcomes is of poor quality

Some of the differences between the comparison group and the IHPI Completers are summarized in Figure 23 and Figure 24 on pages 94 and 95, respectively. Figure 23 examines several low birthweight-related variables before and during the IHPI program period. The red bars represent the percentages of various problems in the eligible low birthweight population from Denver Health in 1995 -- *before the IHPI program was in operation*. This is the baseline condition in the pregnant population before IHPI. The green bars show the percentages after the program began, and indicate the change that might be due to the program. _Both red and green bars display data only for women who were not contacted by the program_. Take, for example, the percentage of eligible women who had a previous premature birth. Before the IHPI program, about one in three women

with low birthweight deliveries had had a previous premature birth. But after the program started recruiting clients, this percentage dropped to about 10%. Because these are women who were not contacted by the program, the most likely explanation for this phenomenon is that the IHPI program targeted those women who had had previous premature births. By moving these women into the contacted population, the non-contacted percentage drops.

In fact, the program was targeting women using several predictors of a future poor birth outcome, not just the variables listed in this graph. And the "subsequent low birthweight delivery bar" on this graph confirms its success at recruiting the highest risk women. Nearly 20% of the women with a low birthweight baby in 1995 went on to have another low birthweight baby in their next pregnancy. But after the IHPI program began to operate, only 10% of the eligible, non-contacted women went on to have another low birthweight delivery -- a 50% reduction This indicates that the program was very effective at selecting out the

women who were at highest risk for a subsequent poor pregnancy outcome.

In Figure 24, the distributions for the birthweight of the index child are compared for the IHPI Completers; for the women who were contacted but declined to participate (the original comparison group); and for the eligible women who were never contacted about the program (the new comparison group). The differences are dramatic. In the non-contacted group, 70% had babies over five pounds, while for the IHPI Completers, only one in three had a baby at this weight level. The graph also shows that those who were contacted by the program, but declined to participate, lie between these two groups. As all of these women qualified and were eligible for the program, it is apparent that the IHPI selection process was targeting the women with the lower low birthweight babies.

These differences are problematic for the follow-up comparison because it means that the non-contacted cases, the ones that would have made up the new comparison group, are at a significantly lower risk for a

Figure 22

DENVER HEALTH CASES QUALIFYING FOR HISTORICAL COMPARISON

	DHHA LBW Charts Reviewed	Qualified & Eligible for IHPI LBW Criteria	% of Reviewed LBW Cases	No IHPI Contact	% of Eligible Cases
1995	225	166	73.8%	154	92.8%
1996	239	201	84.1%	70	34.8%
1997	230	162	70.4%	67	41.4%
First half of 1998	101	71	70.3%	47	66.2%
Total	795	600	75.5%	338	56.3%

future poor outcome. The effectiveness of the IHPI recruitment process appears to have created a bias in the potential comparison group. As a result, when making a comparison to the IHPI clients -- who are at a much higher risk for a subsequent problem pregnancy -- the non-contacted low birthweight women do not make a good comparison group.

Another problem with this new comparison was also uncovered during the analysis. The quality of the official birth certificate data, which was to be used for information pertaining to subsequent pregnancy and delivery problems, was found to be inadequate.

A comparison was made between the data from the Birth Certificate Office and the results from the nurse review of the medical chart on the 338 low birthweight deliveries at Denver Health. It was found that the birth certificate data missed a significant number of problems related to the pregnancy and the birth. The complete details of the birth certificate comparison are available in Tables P and Q the Appendix on page 174. This birth certificate quality issue has been found in several studies with a
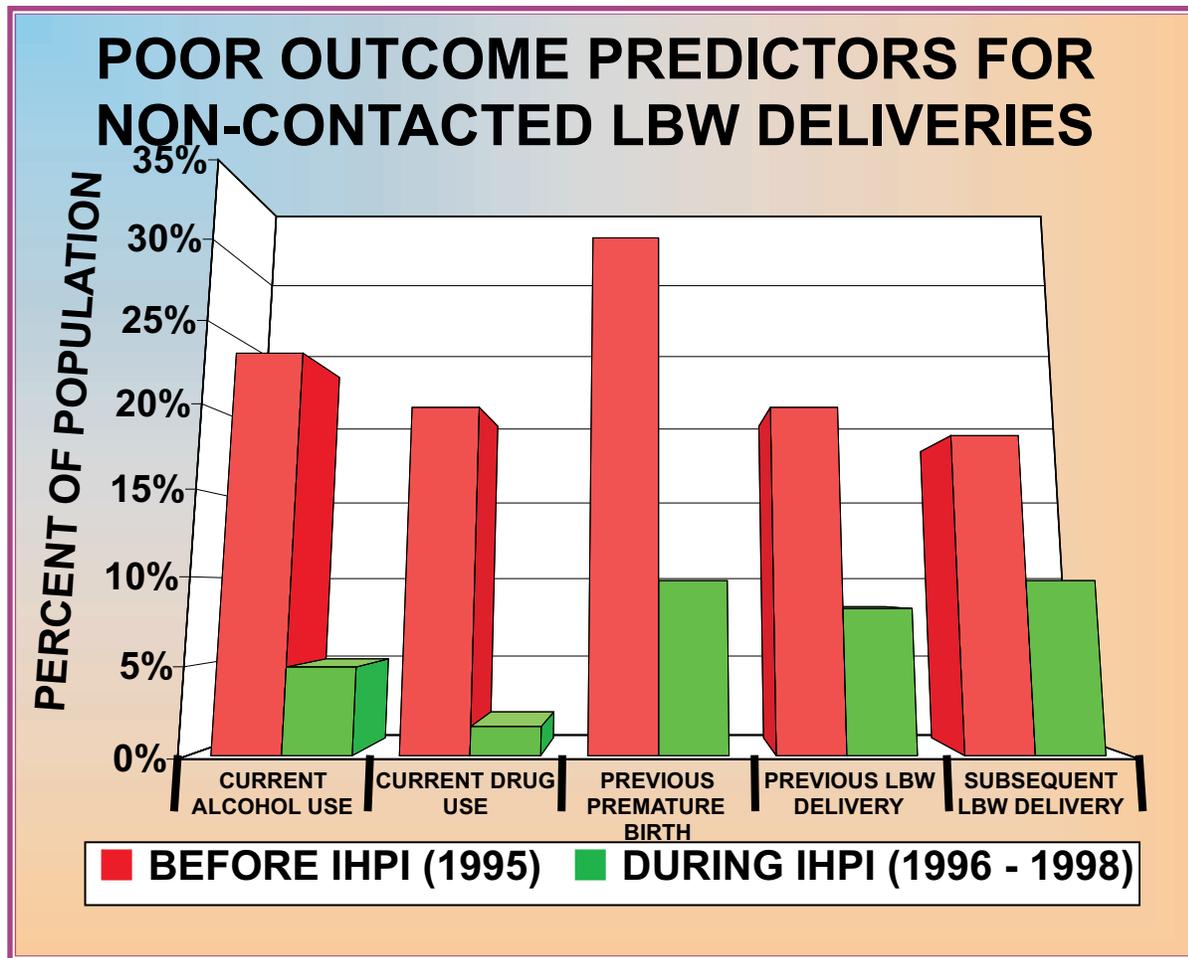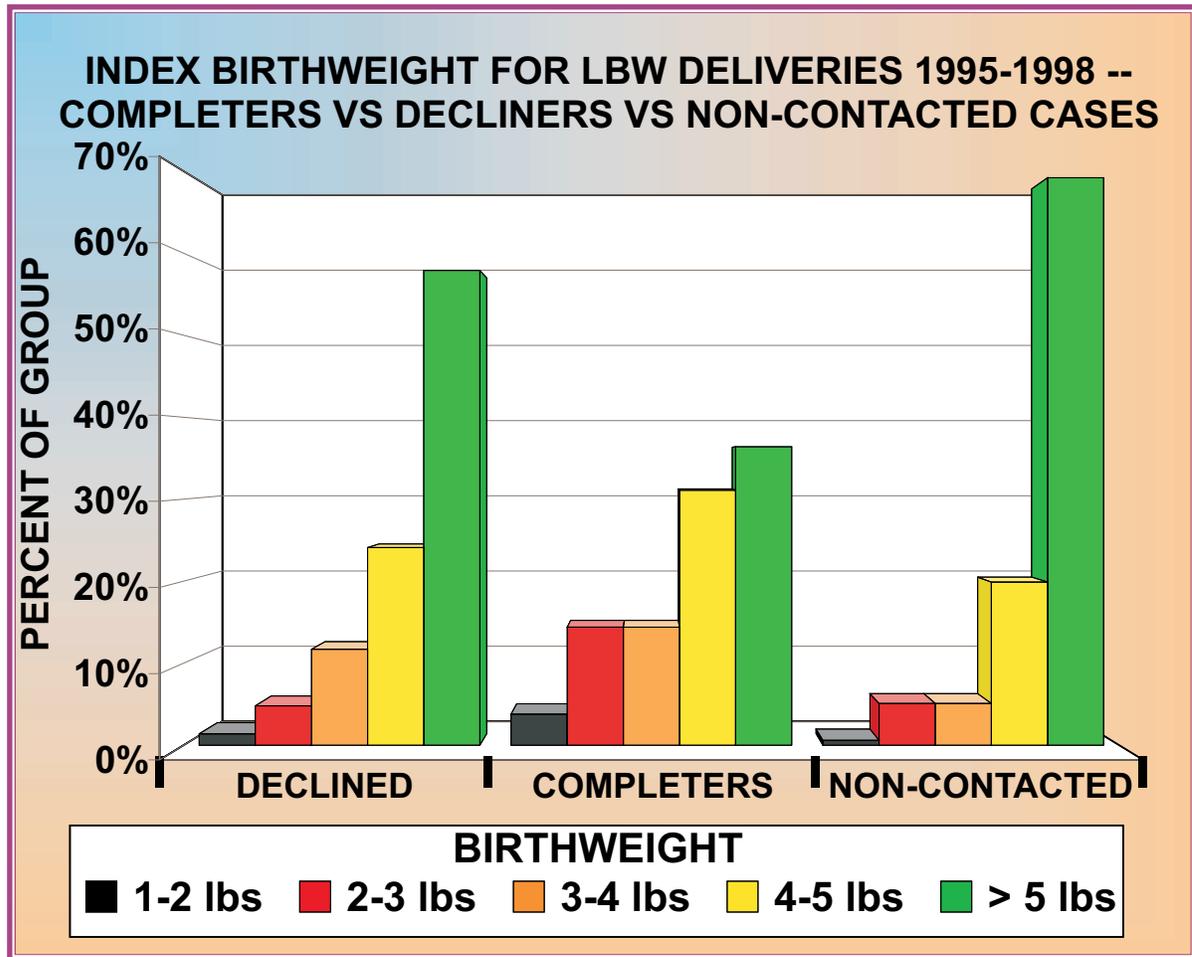
Figure 23

POOR OUTCOME PREDICTORS FOR NON-CONTACTED LBW DELIVERIES

Figure 24

INDEX BIRTHWEIGHT FOR LBW DELIVERIES 1995-1998 -- COMPLETERS VS DECLINERS VS NON-CONTACTED CASES

Bar chart. Y-axis: PERCENT OF GROUP, 0% to 70%. Groups: DECLINED, COMPLETERS, NON-CONTACTED. Legend — BIRTHWEIGHT: 1-2 lbs, 2-3 lbs, 3-4 lbs, 4-5 lbs, > 5 lbs.

variety of other populations (see the Appendix for more details).

The analysis of the pregnancy and birth complication characteristics of the new comparison group confirms that the original comparison group -- the women who declined to participate in the IHPI program -- are in fact the best available comparison group. Not only were these women eligible for the program, but the IHPI case managers had carefully targeted these women as needing the services of the program. Although there are some significant differences between the Decliners and the women who agreed to participate (see the Program Participant section on page 70), they are the group that is most like the IHPI participants -- short of a strict control group -- and are used here for the comparison of future outcomes.

The women in the Completer and Decliner groups were followed-up through Denver Health medical records for information pertaining to subsequent pregnancies and medical care for up to 40 months after enrollment in the program. While not all of the women returned to Denver Health for care, most did. Consequently, one drawback to this comparison is that some of the women who

did not return to Denver Health might have received follow-up care elsewhere. The data reported represent only the information on subsequent pregnancies and births available through the Denver Health medical records. It is entirely possible that additional pregnancies and births occurred outside of the Denver Health reporting system, and these are not included in this report. However, there is no reason to believe that the Decliners would have a different attrition rate than the Completers.

The first comparison examines the proportions of women who kept their first post-partum checkup visit shortly after the qualifying births. As seen in Figure 25 on page 96, the women who participated in the IHPI program were much more likely to keep this appointment than the women who declined to participate (72% vs 51%).

Very similar results are seen when looking at the attendance at the follow-up family planning appointment. Figure 26on page 97 shows the percentages of women who kept a family planning appointment after the birth of the index child. As seen in the graph, 70% of the IHPI Completers kept their appointment, while only 44% of the women who rejected IHPI participation attended a family planning visit.
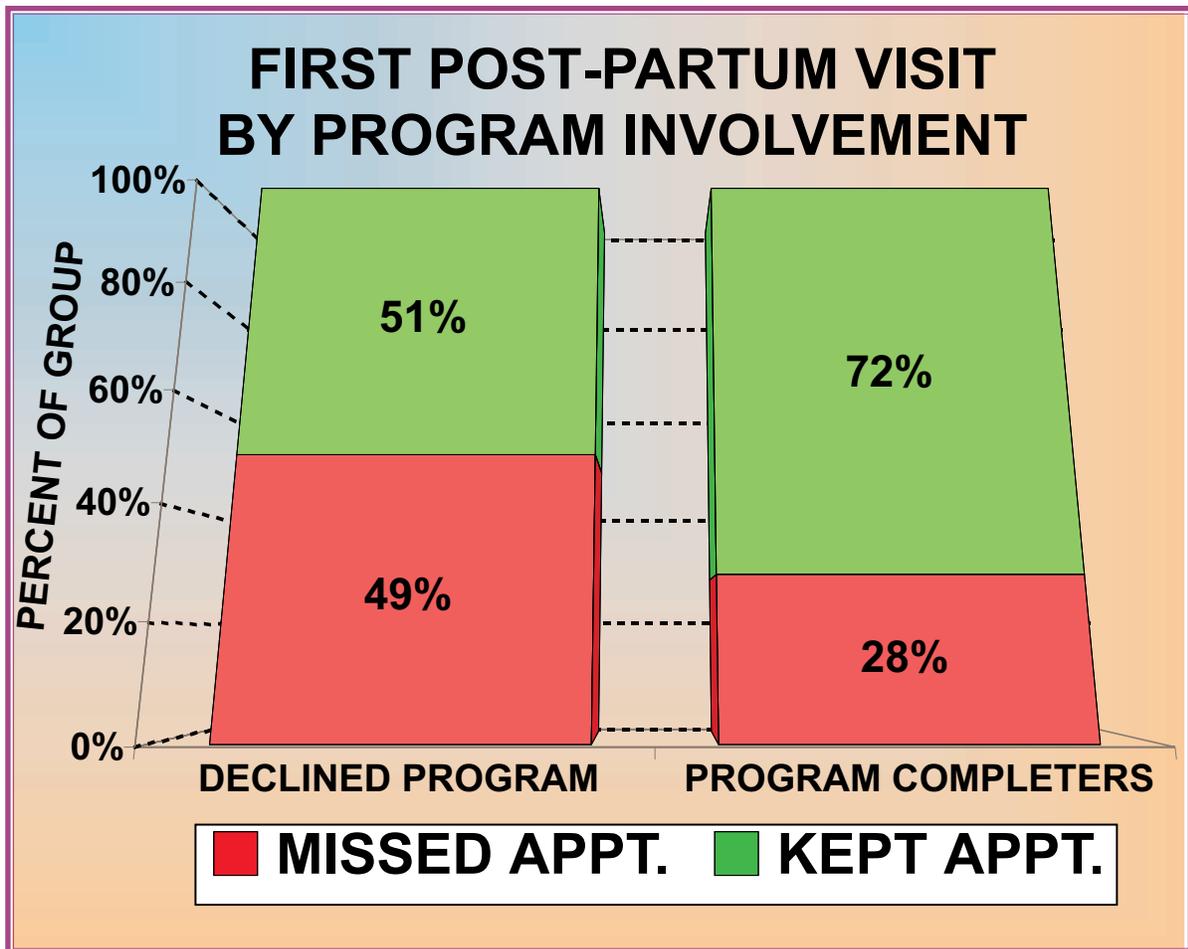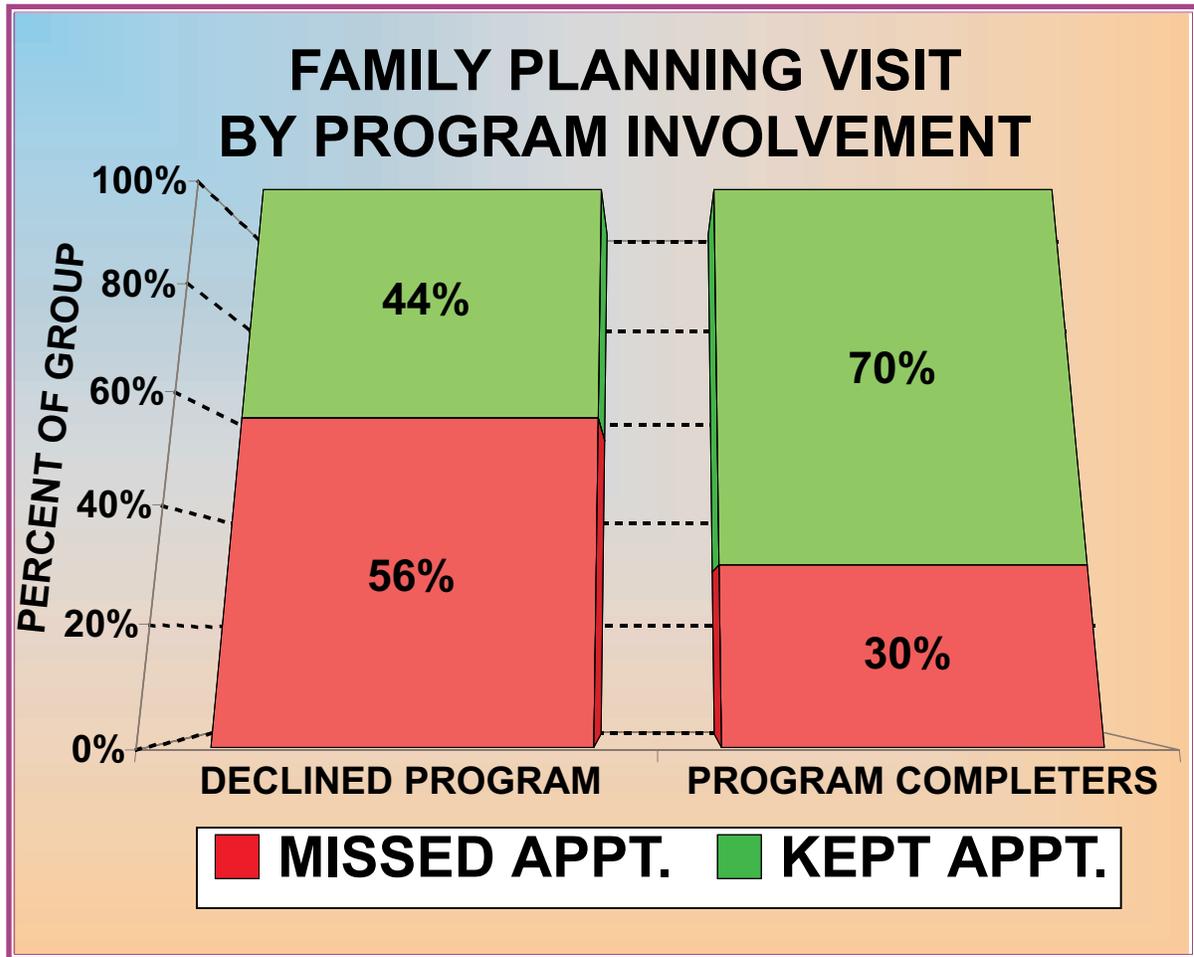
Figure 25

FIRST POST-PARTUM VISIT BY PROGRAM INVOLVEMENT

Figure 26

FAMILY PLANNING VISIT
BY PROGRAM INVOLVEMENT

(Chart showing PERCENT OF GROUP on y-axis from 0% to 100%)

DECLINED PROGRAM: MISSED APPT. 56%, KEPT APPT. 44%

PROGRAM COMPLETERS: MISSED APPT. 30%, KEPT APPT. 70%

■ MISSED APPT.   ■ KEPT APPT.

We also studied choice of birth control method at the family-planning visit (Figure 27 on page 98). For the program Completers, the most common form of birth control was Norplant or Depo-Provera (46%), followed by oral contraceptives (32%). Only 12% were not using any form of birth control. For the women who declined to participate in the program, however, the largest group was not using any form of birth control after the birth of the index child (35%), followed by the Norplant/Depo-Provera group (32%).

Next, we studied subsequent pregnancy rates. Not all of the women were in the follow-up for the same length of time, and they could become pregnant at any time during (or after) the follow-up study. An important factor in estimating the number and proportion of subsequent pregnancies is the length of time of the follow-up period. While the average client was followed for a year and a half, many were in the follow-up group for a much longer period of time, while others were in it for much less time. However, as demonstrated in Figure 28 (on page 99), the proportions of women at each month in the follow-up study for the two

groups are virtually the same. The graph also shows that the longer the follow-up period, the fewer number of women there are remaining in the follow-up study. While at the beginning month of the follow-up there are 100% of the women in the follow-up sample, at 12 months this is reduced to 70%, at 24 months it is 40%, and at 36 months it is only 15%. This means that the reliability of the results toward the end of the follow-up period is more in doubt. (The complete numbers are presented in Table O on page 172 of the Appendix.)

Instead of taking a "snap-shot" approach and providing subsequent pregnancy results for just one point in time or for the follow-up period overall, it is more appropriate to examine the results for each month of the follow-up period. Figure 28 also graphs the subsequent pregnancy rate data by follow-up month for the two groups. This is shown as the two blue lines in the graph (using the right-hand axis). Keep in mind that the earlier months have more reliability, while the data in later months are less reliable.
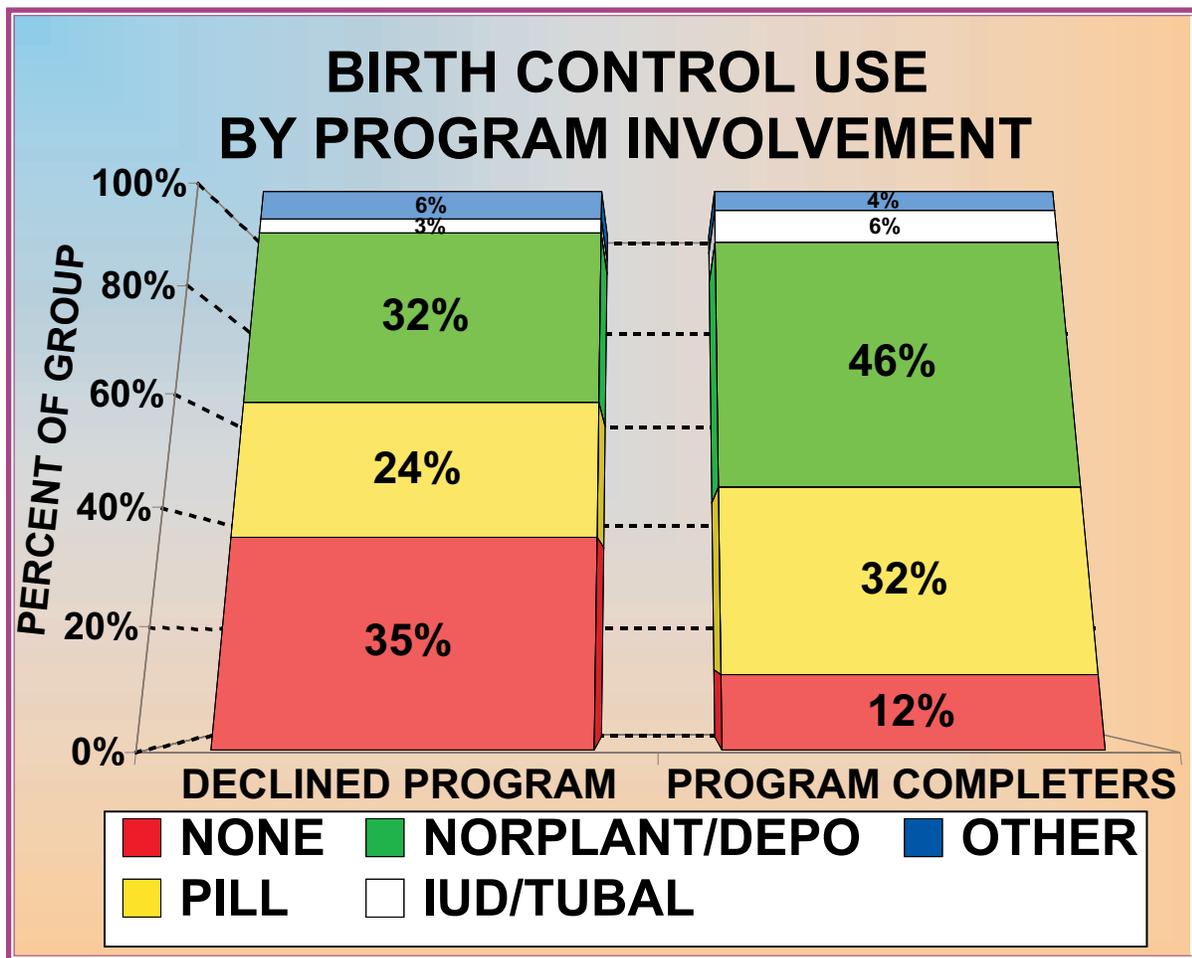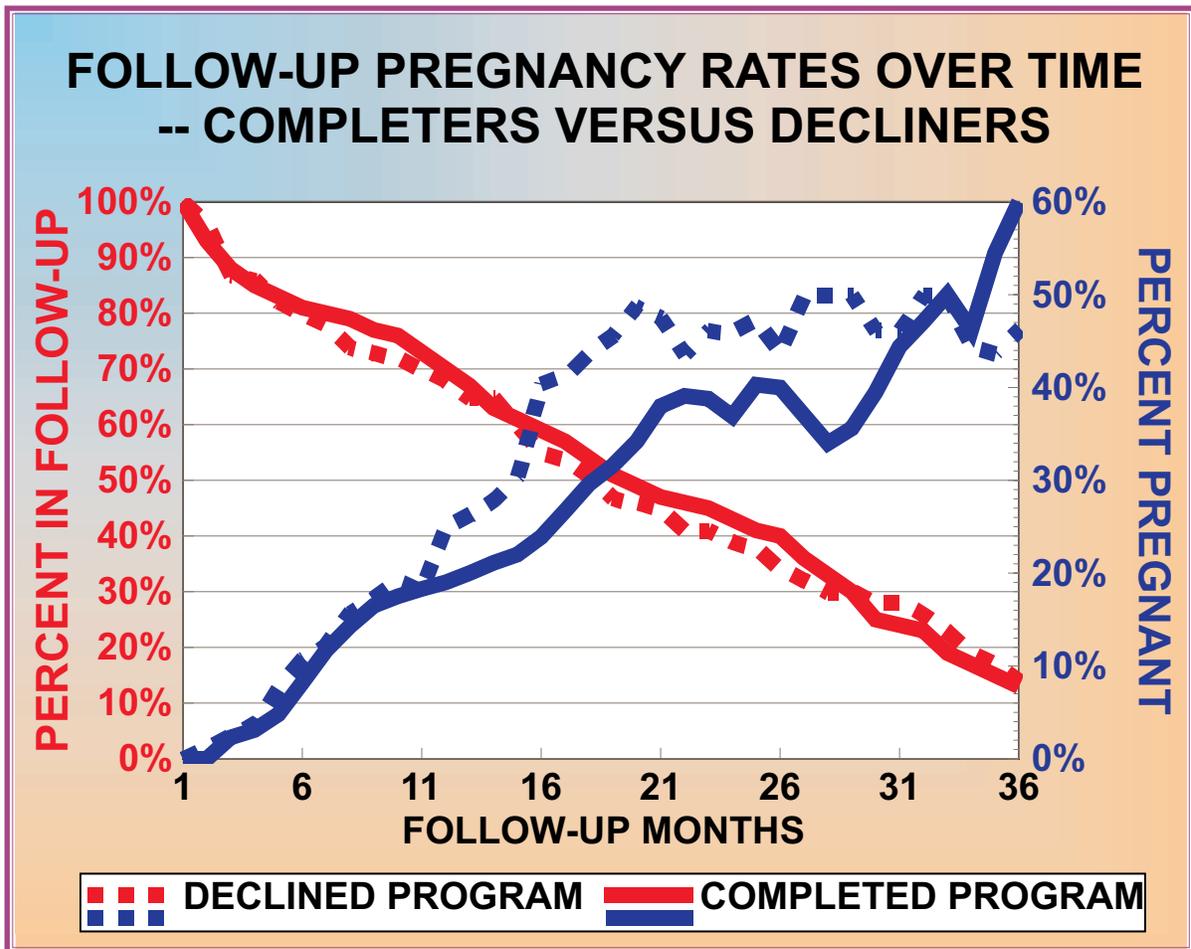
Figure 27

BIRTH CONTROL USE
BY PROGRAM INVOLVEMENT

Figure 28

FOLLOW-UP PREGNANCY RATES OVER TIME -- COMPLETERS VERSUS DECLINERS

This graph shows that during the first year, the pregnancy rate increases at the same rate for both Completers and Decliners. This is also the time period with the greatest number of cases so we have the greatest confidence in these results. During the second year of the follow-up, the IHPI Decliners begin to out-pace the program Completers in their repeat pregnancy rates. By about 18 months, nearly half of the Decliners have become pregnant again, while only about one-third of the IHPI Completers are pregnant. After this point, the lines begin to vary markedly from month to month -- as a result of the decreasing sample size -- and our confidence in the data

declines. These results suggest that even if the overall repeat pregnancy rates are not significantly different between the two groups, the Decliners tend to have a shorter interconception interval.

Figure 29 on page 100 shows the distributions of the interconception period for those women in the two groups who became pregnant during the follow-up study period. The interconception period is an estimated figure and is computed to be the time period between the birth of the index child and the date the mother became pregnant again (regardless of the outcome of the pregnancy). The IHPI Decliners had a

median interconception period of 358 days (mean of 381 days) while the program Completers had a median of 464 days (mean of 481 days). Although this 106 day difference is dramatic, it does not reach statistical significance due to the enormous variance in the groups. Some women were pregnant again in less than three months after the delivery of the index birth, while other women did not become pregnant again for three years. With a variance spread of this magnitude, it is very difficult to achieve a statistically significant difference between the two groups. Perhaps with a larger study group, this difference might reach significance.

Of course, not all of these subsequent pregnancies resulted in a birth and Figure 30 on page 101 summarizes the pregnancy outcomes. For some cases, the final outcome was not known (19% for the Completers vs 25 % for the Decliners) but this is not significantly different for each group. The main reason for a lack of outcome is due to the pregnancy not being completed at the end of the follow-up study. For those with known outcomes, the largest outcome category for the program
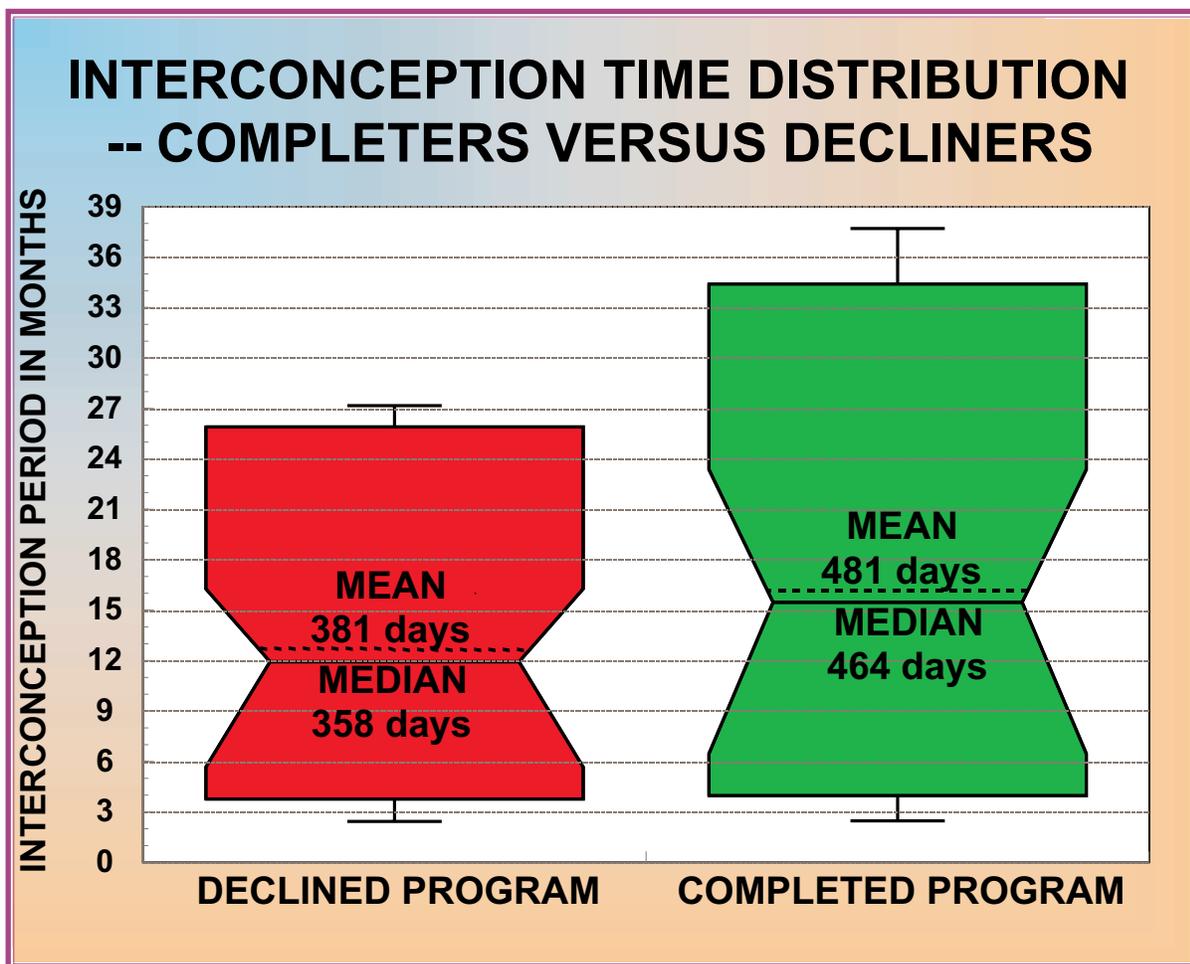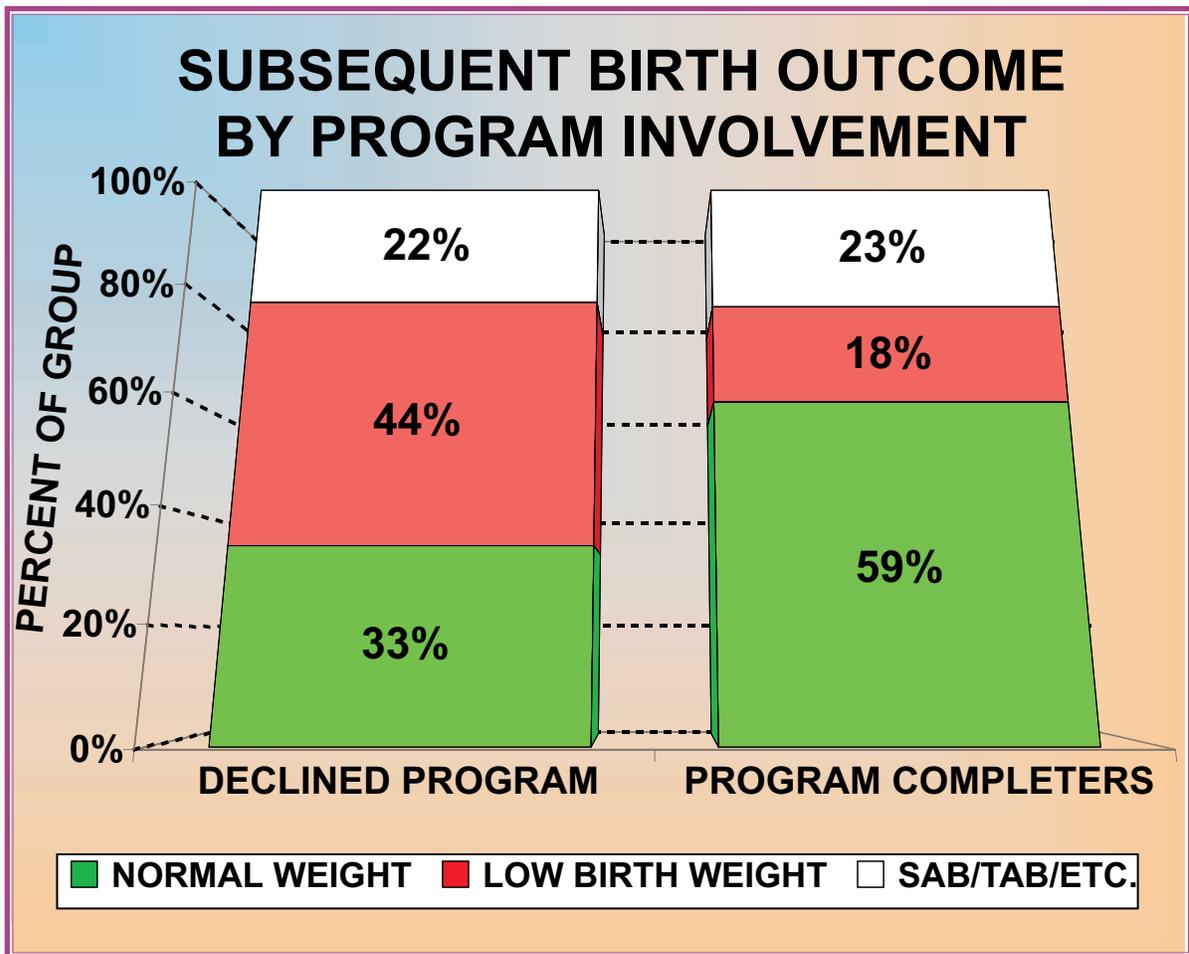
Figure 29

INTERCONCEPTION TIME DISTRIBUTION -- COMPLETERS VERSUS DECLINERS

Figure 30

SUBSEQUENT BIRTH OUTCOME BY PROGRAM INVOLVEMENT

Completers is a normal weight baby (59%), while for the Decliners it is a low birthweight baby (44%).

The program appears to have successfully targeted, recruited and enrolled the women who were most likely to have poor outcomes for their subsequent pregnancy. As seen in Figure 23 on page 94, the expected subsequent low birthweight rate for all women who had a low birthweight delivery at Denver Health (using women before the IHPI began operations as a baseline) was just under 20%. But after the program began operations, for the women who were contacted by the program yet declined to participate, the repeat low birthweight rate was more than double -- at least 44% (see Figure 30 on page 101). For those who participated in the program, the subsequent low birthweight rate was less than half of this -- 18%.

A closer look at these subsequent birth outcomes reveals some interesting differences, especially when compared to the outcomes of the index pregnancy that qualified these women for the IHPI program. The birthweight for both pregnancies in both groups is shown in Figure 31 on page 102. The graph also

shows the low birthweight cut-off for program qualification as a dotted line. For the index birth, the IHPI Completers that became pregnant again during the study follow-up period are significantly different from the women who declined to participate. The IHPI participants' index babies weighed significantly less.

When the subsequent births are examined, we see another significant difference between the two groups, but this time the Completers' babies are the heavier group. Most importantly, the mean birthweight for the subsequent births for the program Completers has risen above the 5.5 pound low birthweight cut-off. This did not happen with the program Decliners. As seen in Figure 30, this does not mean that all of the IHPI participants' subsequent births were above the low birthweight cut off, but there was a significant increase in weight.

Selecting out the low birthweight babies for both groups and seeing when they occurred during the follow-up period is very revealing. This is shown in Figure 32 on page 103. This graph shows the percentage of subsequent births for the two groups, over time, that were low birthweight. The time
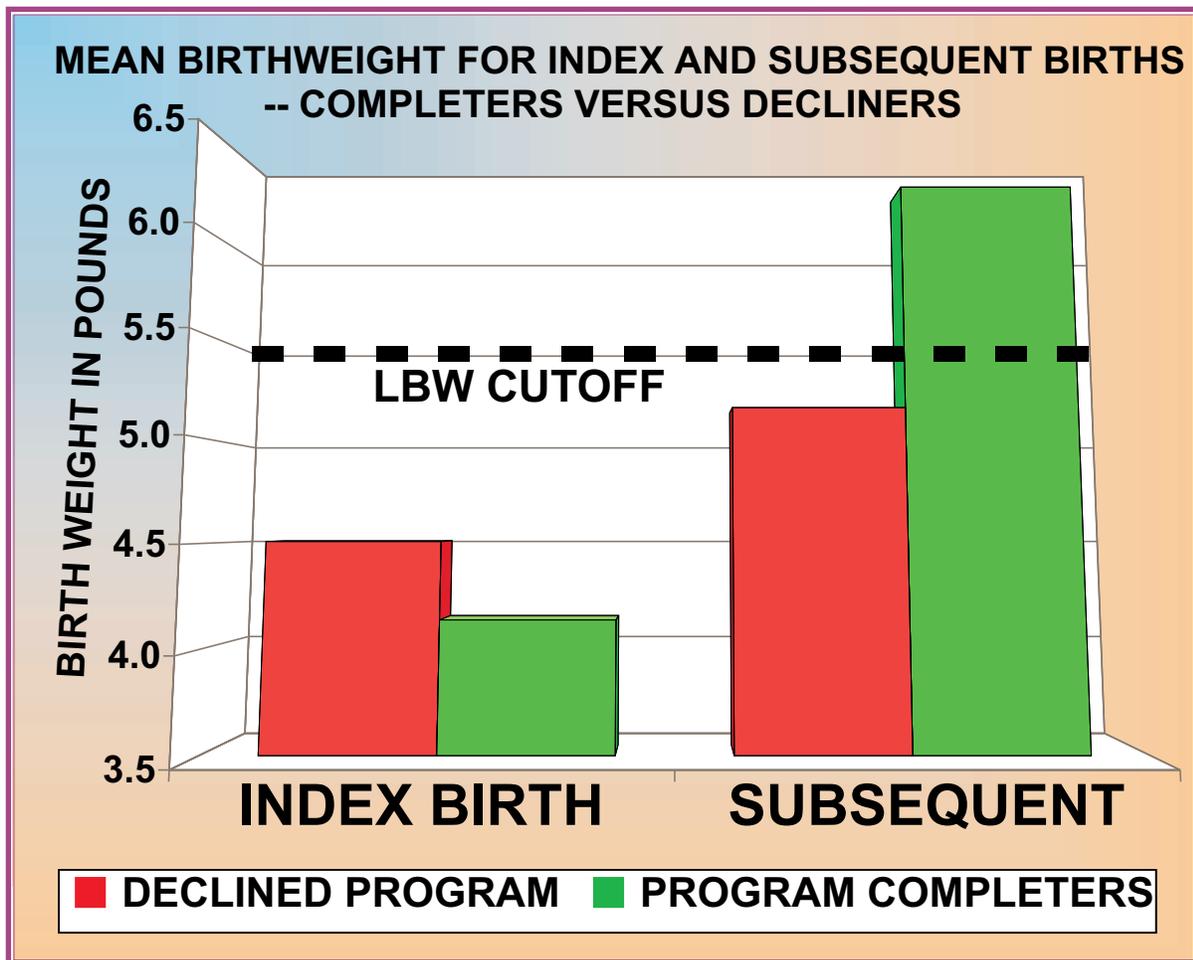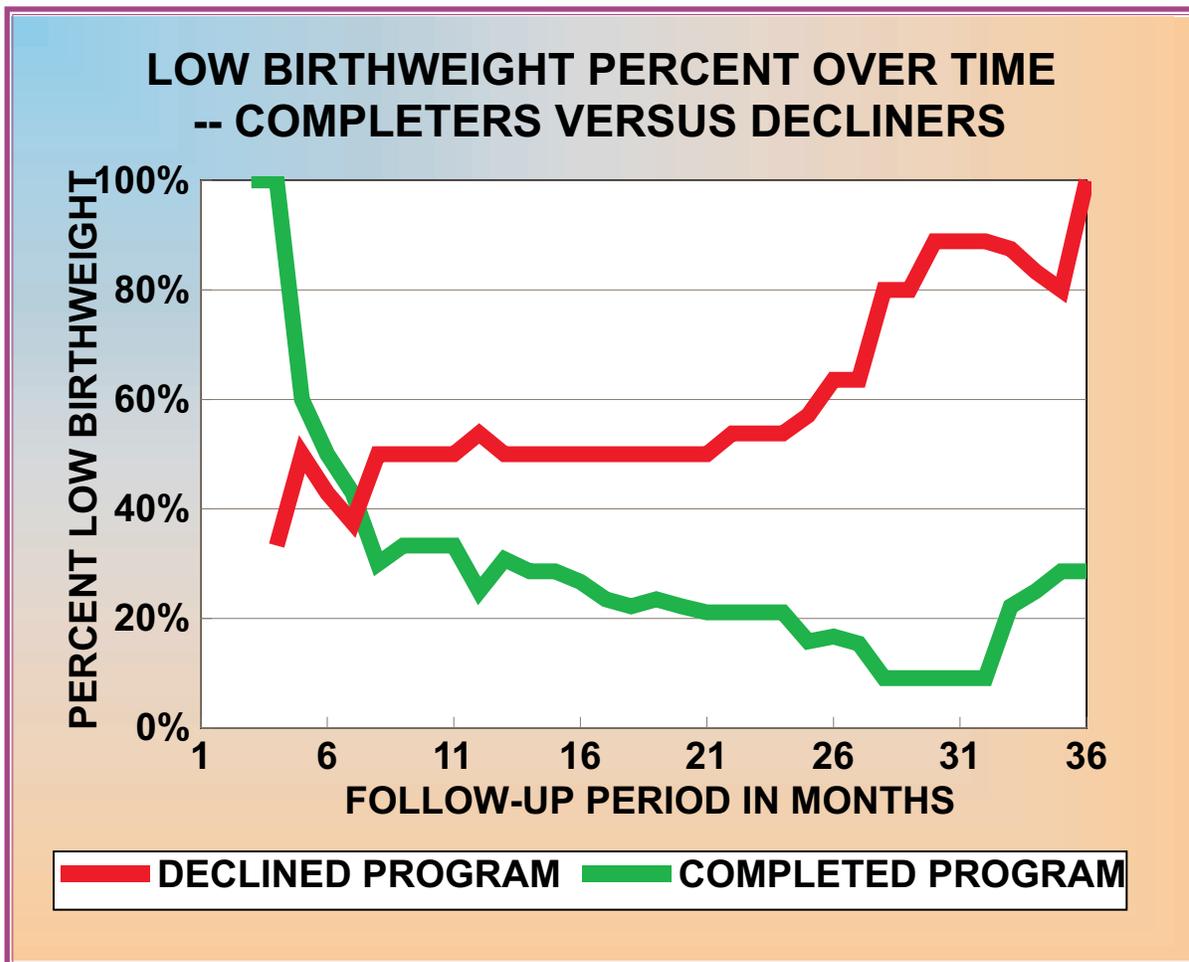
Figure 31

MEAN BIRTHWEIGHT FOR INDEX AND SUBSEQUENT BIRTHS -- COMPLETERS VERSUS DECLINERS

Figure 32

LOW BIRTHWEIGHT PERCENT OVER TIME -- COMPLETERS VERSUS DECLINERS

period is the interconception time period, not the time to the subsequent birth.

The graph shows that women who conceived in the first few months of the interconception period had a high percentage had low birthweight babies. This could be just a statistical anomaly since there were very few women that became pregnant in this time period (for details see Table O in the Appendix on page 172). During the six-month to 18-month period, the number of births increases and the differences between the two groups become more apparent. The time period after two years shows a significant drop off in the

number of cases still in the follow-up, so the results at that point become less reliable.

Overall, it is apparent that in this group of high-risk women, subsequent births from conceptions occurring soon after the birth of the index child have a very high rate of low birthweight. Over time, as later births are added in, the two groups diverge in the percentage having a subsequent low birthweight baby. The Program Completers appear to level off at about a 20% low birthweight rate, while the program Decliners average more than double this rate.

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Figure 33 on page 104 summarizes the low birthweight rate for the two groups. In the IHPI Completer group, 23% of the women had a low birthweight baby in their subsequent delivery, compared to 57% of the Decliners -- a statistically significant difference. Also significant was whether the baby needed to spend time in the NICU after the birth. None from the Completers group did, but one out of three from the Decliners group required an NICU stay.

While we can determine that Completers and Decliners have differing rates of re-conception and low birthweight babies, our ability to predict exactly which women -- in either group -- will become pregnant, and when this will occur, is more limited. There do not appear to be any significantly correlated variables that can predict which women will become pregnant. This is in contrast to the variables that predict which women will participate in the program. But while we cannot accurately predict which women will become pregnant again, there is one variable with strong predictive power for future low birthweight babies: country of origin.

Figure 34 on page 105 shows a comparison between women that were born
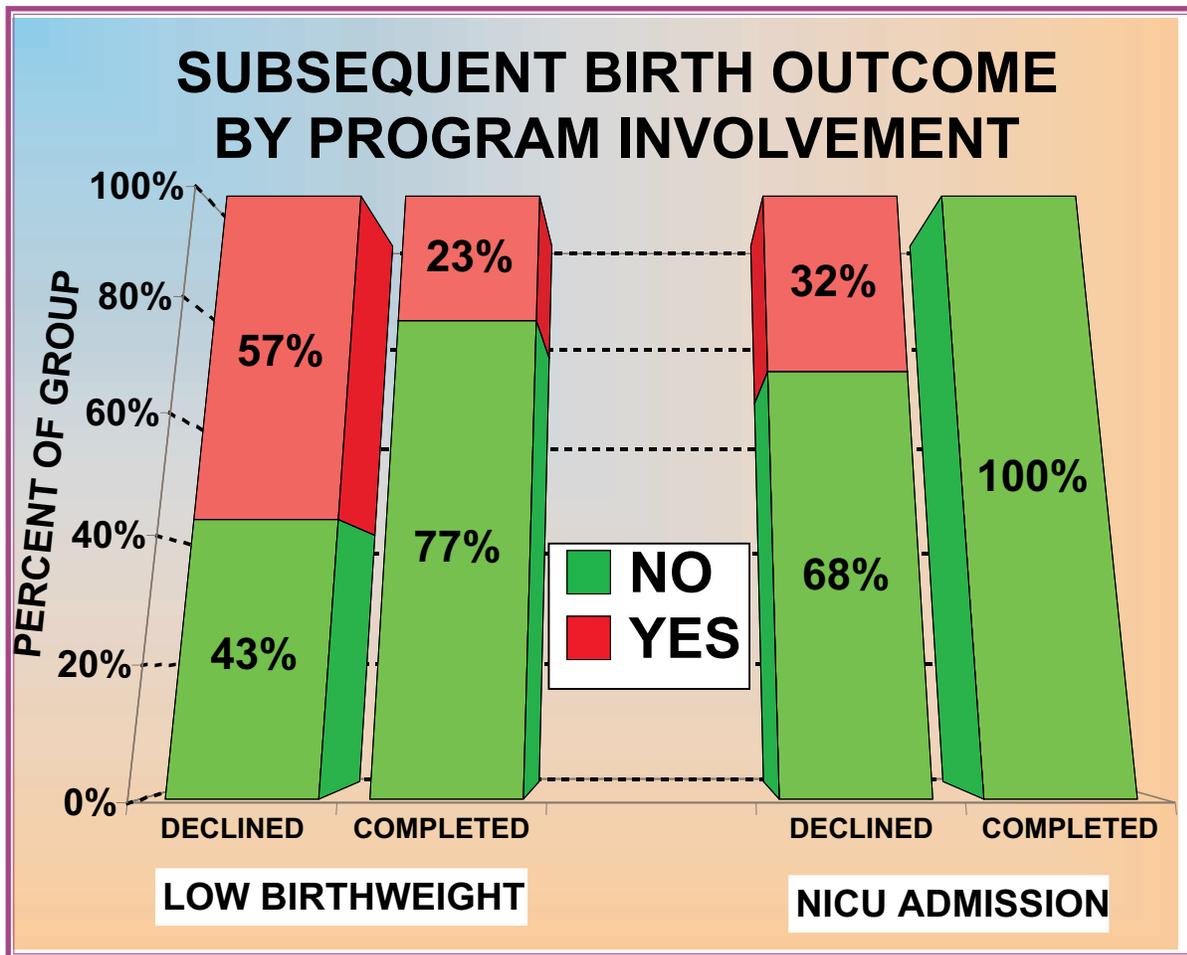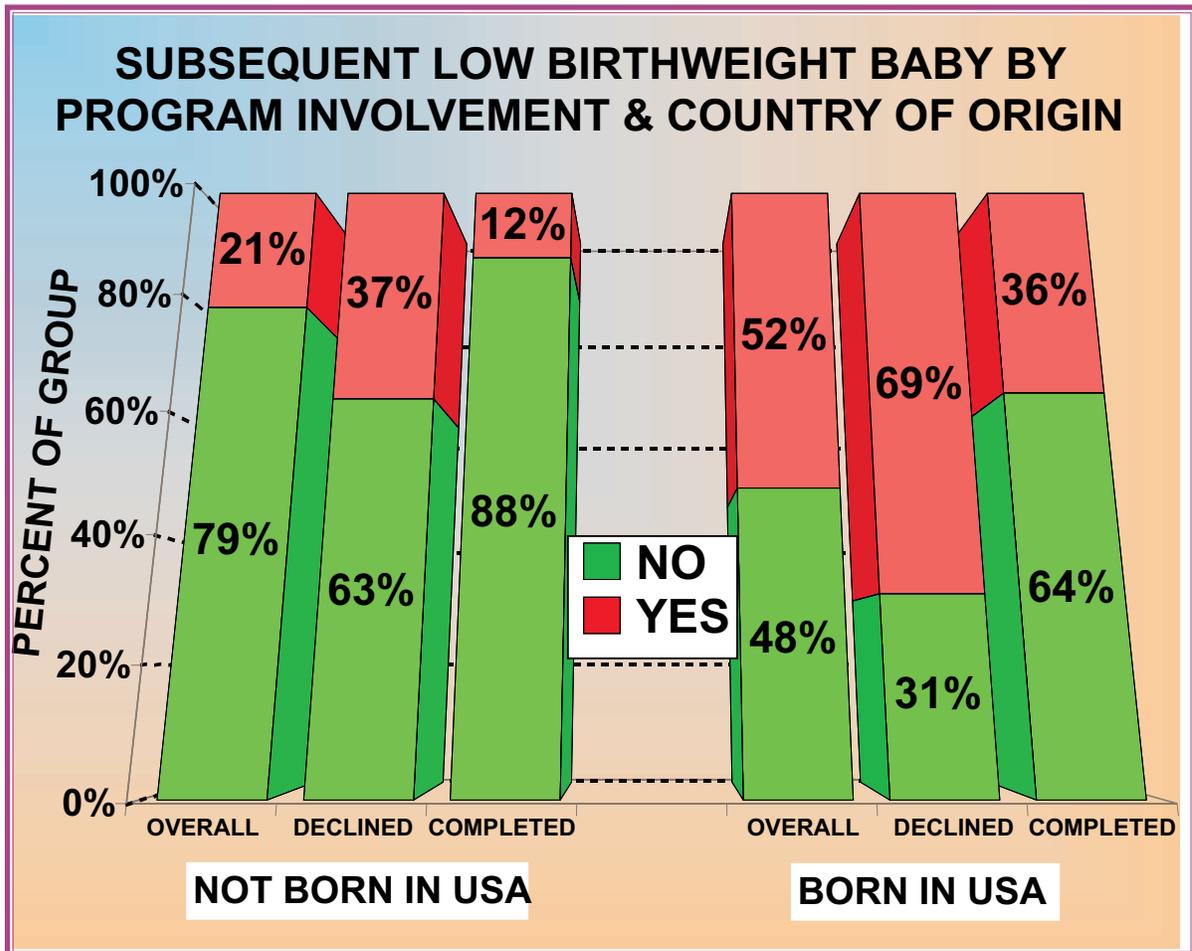
Figure 33

SUBSEQUENT BIRTH OUTCOME BY PROGRAM INVOLVEMENT

Figure 34

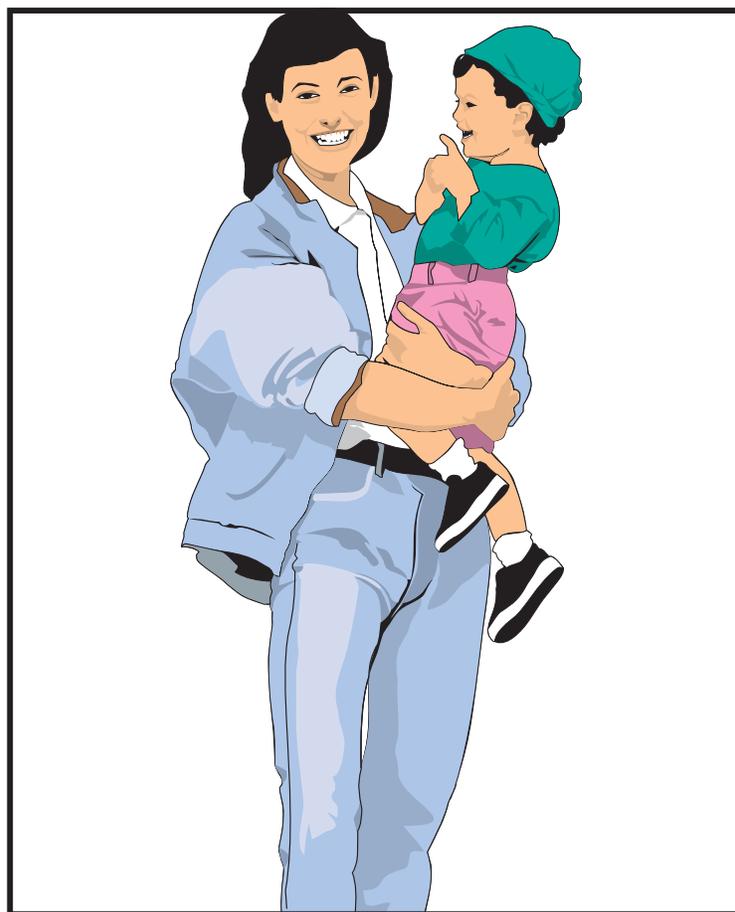SUBSEQUENT LOW BIRTHWEIGHT BABY BY PROGRAM INVOLVEMENT & COUNTRY OF ORIGIN

in the USA versus those born elsewhere. For the USA group, slightly more than half (52%) had a subsequent low birthweight baby. For the non-USA group, the rate was less than half of this (21%). The differences become even more dramatic when IHPI program involvement is considered. For non-USA IHPI Completers, the subsequent low birthweight rate is 12% while the USA-born IHPI Decliner group had a 69% low birthweight rate in their next delivery. There are several possible explanations for this difference. We know that being born in the USA is correlated, in this population, to several risky behaviors such as smoking, drinking, drug use, etc. Those not born in

the USA have significantly lower levels of these risky behaviors. These and other factors could be playing a part.

In sum, the results of this section look very promising regarding IHPI program effectiveness. Women who participate in the program are more likely to follow through on their post-partum care and birth control use after the index birth. In addition, they appear to have a longer interconception period than women who decline to participate. Finally, their subsequent births are heavier; less likely to be low birthweight; and less likely to require a stay in the NICU.

CONCLUSIONS AND DISCUSSION

CONCLUSIONS AND DISCUSSION

The goal of the Interconception Health Promotion Initiative (IHPI) was to demonstrate the feasibility of a case management program for women at risk for delivering a subsequent low birthweight baby. It accomplished this goal.

As a demonstration project, the IHPI initially was not designed to measure program effectiveness through the use of comparison groups. As the evaluation progressed, however, there was an increased interest in a more rigorous analysis of program outcomes. Although it is not ideal to select a comparison group after the fact, we decided it was better than no comparison. As described in the results section, we studied the characteristics of several potential comparison groups, including women who were recruited but chose not to participate (Decliners), and women who had low birthweight babies in the period before the initiation of the program (a historical cohort). Because the program had selected women based on risk characteristics, rather than randomly, it turned out that the participants were in fact quite different (that is much higher risk) than the historical cohort, and that we could not create a comparison sample from the cohort without the use of complicated, questionable matching techniques. In the end, we determined that the Decliner group was in fact the closest potential comparison group. Nevertheless, there were some differences between the participants and the Decliners, most significant being that the participants were more likely to have sicker babies, and that the Decliners were more likely to have significant social and psychological problems.

In the final evaluation of the IHPI, there were notable and significant findings regarding:

- program recruitment and enrollment
- the content and amount of the IHPI case management program services provided to clients
- the impact of IHPI in terms of behavioral outcomes, the interconception period, and the risks of future low birthweight infants

The following sections summarizes these findings, under the same headings that were presented in the Results section.

Program Penetration

"What proportion of eligible women were recruited by the IHPI program?"

This analysis of the recruitment process for the IHPI provides a useful description of the factors predicting enrollment in a case management program geared to high risk women.

About three quarters of the qualifying births met the IHPI program eligibility requirements, with the most common exclusion criteria being tubal ligations and multiple births. Very few women were excluded due to language requirements, incarceration or involvement with other programs. Overall, the eligibility requirements were not unduly restrictive. Of those eligible for the program, only about half were approached regarding participation, primarily due to limited space in the program.

As a result of the space limitations, and the non-random recruitment of women into the IHPI, there were notable characteristics of the women who were approached to participate in the program. Compared to the population of women eligible for the program, women contacted by IHPI had fewer prenatal visits, lower birthweight babies, and were more likely to deliver prematurely, to be single, and non-Caucasian. They also had higher rates of social and psychological problems. Put simply, women approached by IHPI were at higher risk for future poor pregnancy outcomes than eligible women who were not approached.

Given limited space in the IHPI program, case managers were clearly selective in recruiting women they thought would benefit the most from the program's services. This selectivity in recruitment has several implications for the program. First, it may mean that this population, being at higher risk, may potentially need more services, and possibly for a longer time than might be true of a randomly selected group of low birthweight mothers. Secondly, the selectivity made it difficult to analyze the effects of the program, because the women who were eligible but not contacted could not be used as a reasonable comparison group.

In summary, we found that in a safety net hospital system with large numbers of deliveries, there was no difficulty in identifying and recruiting potentially eligible clients for a program targeting women with poor birth outcomes. The limiting factor was space in the program. As a result, case managers were selective in their recruitment, with preference for women at the highest risk for the outcomes we were trying to prevent. This recruitment bias had significant implications in analysis of the effectiveness of the program. In designing future studies of efficacy and cost effectiveness of case management programs, it is important to have strict recruitment criteria, and random allocation of women into control and participant groups.

Program Participation

"Are certain types of women more likely than others to agree to participate in the IHPI program?"

Of the women contacted concerning IHPI, just over half (53%) agreed to participate. There were several factors that were highly predictive of program participation, with the most important predictor being the type of initial contact. Face-to-face contact was the most successful. The client's pregnancy and birth history were also important. Women who had had complications of pregnancy, or poor outcomes in prior pregnancies were more likely to enroll than women without such problems. In addition, women not born in the USA, women with smaller, sicker babies and women with fewer emotional problems of their own were also more likely to enroll. It was particularly interesting that for a given set of risk factors, women who had had sicker babies were more likely to participate than those who had managed to have a better outcome despite the pregnancy or social problems. We speculate that the poor outcome, especially in the case of a poor obstetrical history, cause a heightened sense of vulnerability, and hence an increased interest is working to improve future outcomes.

In the end, a little more than 20% of the eligible women agreed to participate in one way or another in IHPI. This proportion might at first seem low, but since only half of the eligible women were contacted (due to space limitations and the fact that we did not recruit 7 days a week), the participation rate is actually fairly high. In short, most women found the IHPI's program services to be appealing, especially if they had a face-to-face contact, and had a heightened sense of vulnerability due to pregnancy, birth or newborn complications. Women with more social and psychological problems were less likely to participate, especially if they had a relatively good outcome. It may be necessary to devise a different strategy to engage this group.

Use of Services

"What types of services do the IHPI clients use while in the program?"

"Do the services used by the IHPI participants vary from woman to woman?"

"What types of changes do the program participants make while in the program and are these related to the services received?"

As part of the program design, IHPI offered a wide range of services that were tailored to the particular needs of each mother and child. Our analysis of the use of services confirms the variation from client to client in types and intensity of services used. During the course of the program, clients averaged nine meetings of approximately 1 hour each with their case managers. Some clients met for over 25 hours with their case managers; others for fewer than five hours. There were interesting patterns of what was covered during these visits: the highest percentage of visit time was dedicated to helping clients with parenting skills (e.g., parent-child relationship, child development issues) and personal health issues, with the least amount of time on changing behaviors such as smoking or drug use. In addition, the case managers spent more time with clients on those Domains where, at intake, the clients showed greater need, and relatively little time in areas (Domains) where clients had lower risk at intake. These data provide a useful description of the types of issues or requested services that may arise in other similar case management programs.

The evaluation of a program such as IHPI, which is tailored to individual client needs, presents an interesting analytic challenge. It is difficult to determine quantitatively the program's reach and impact when different types of clients with different needs receive different types and amounts of various services. After all, a new pregnancy for one woman could be a success, but for another it might be a setback. Similarly, because of variations in clients needs for services, it is a challenge to devise a measure of the adequacy of the services provided. We had to determine whether clients received appropriate levels of the right types of services at the time when they most needed them. That is, did case managers appear to tailor their programming to the particular risks of their clients?

They did. As shown in the Results section, in most areas the case managers spent the most time working with their clients in the highest risk Domains. There was some variance in when they received these services. For certain Domains, such as Relationship Issues, the case managers concentrated their work with highest risk women in that Domain at the beginning of the program. In other Domains, the services were provided more intensely at a later point. Undoubtedly this is affected by the nature of the Domain, the immediacy and

nature of the risks, the immediacy of issues in other domains, case manager availability and other concerns.

The case managers spent a lot of time in the early stages of a their work with a client in getting them "engaged." They found that as women became more comfortable with the program and the case manager they often revealed more about their risks than was apparent at intake. In fact, this "engagement" process was likely to be the reason why some risks seem to increase for many sub-groups of women during the program, especially those with low risks on initial assessment.

This variance in the risk level estimation at intake provides an additional challenge for the evaluation of case management programs. Risk levels may appear to increase significantly during early stages of a program, due to improved accuracy of information from the women. This information bias is not necessarily addressed by the presence of a control group, if the measured changes in one group are in part a result of better information. If the control group does not go through an "engagement" process similar to the treatment group, the actual risk levels of the control group will likely not be known with the same degree of accuracy as in the participant group. Perhaps having assessments provided to the two groups by a third party, rather than by the case manager would provide a more objective measurement of risk and changes.

At this point, with the unexpected effects of the "engagement" process combined with the lack of a control group, it is difficult to determine the exact impact of the IHPI program on the measured risk levels of the participants. We were able to document that the case managers systematically applied different services according to the risks and needs of the clients. However, we could not assess the overall benefits for any sub-group due to the small sizes of the sub-groups, variations in definition of intermediate outcomes from client to client, and changes in the accuracy of information over the course of the case management process. The major conclusions are therefore descriptive, with documentation that the case managers did indeed spend more time with women in the Domains where they had the highest risk. But in the end, it is more difficult to determine to what extent the case managers directly affected these risks, at least during the relatively short time of the current measurements.

Program Completion

"Are women who complete the program more likely to comply with post-partum care and birth control use?"

"Are those who complete the program more likely to delay their next pregnancy?"

"Do program Completers have better outcomes in subsequent pregnancies than those who declined to participate in the program?"

The results in this section were derived from comparison of the program Completers to the comparison group. Although there were findings suggesting a significant effect of the program, it is important to keep in mind the fact that the comparison group was not randomly selected, and that IHPI was initially designed as a demonstration project and not as an effectiveness study. Data collection was designed to offer a simple, longitudinal description of some of the changes that may occur as a result of an intensive case management program, using a pre-post-only design without a control group. However, over time, the evaluation design was modified to include a non-equivalent comparison group to compare data on select indicators of prenatal care and subsequent birth outcomes. Both designs were used to determine different aspects of IHPI's impact.

The pre-post part of the design analyzed changes in client risk status, over the course of the first 12 to 18 months of involvement in the program. Although the absence of a comparison group precludes our ability to make definitive cause-effect statements, there was a consistent trend that women at the highest risk levels at intake decreased their risk over time. In some Domains, women who were initially at lowest risk appear to increase their risk over time. As noted in the previous section, however, changes in measured risk status where distorted by the clients' tendency to reveal more about their risks over time.

For the comparison with a non-equivalent control group, the greatest challenge was selecting the best possible comparison group. Initially, two possible comparison groups were assembled:

1. Decliners — those IHPI-eligible women who were approached regarding participation, but refused to participate in IHPI

2. Non-Contacted — an historical group of women from a similar timeframe who resembled IHPI women in terms of their low birthweight status, but who were not approached for the case management program

Preliminary analyses of the two comparison groups to the IHPI Completers showed several significant differences. Various techniques, such as differential

selection, were used in an attempt to minimize these differences without success. After careful analysis of both possible comparison groups, we determined that, although the women in all of the potential comparison groups were quite different from those women enrolled in IHPI, the program Decliners constituted the most adequate comparison group to estimate the program's impact.

The comparison of Completers and Decliners revealed several promising findings. Compared to the women who refused the program, women completing the IHPI were more likely to keep their initial post-partum and family planning appointments, to use some form of birth control, and when they used birth control, use a more effective method than did the Decliners.

Perhaps the most interesting finding pertains to the subset of women who became pregnant again during the follow-up period. Both groups had a relatively high proportion of subsequent pregnancies (not a surprising finding given that we were recruiting women who planned to have more children). The Decliner group in general had poorer birth outcomes than did the IHPI participants. Among participants who had another pregnancy, the interconception period was longer (on average by more than three months) and the babies were heavier and significantly less likely to spend time in the NICU than among the Decliners. When we control for the known predictive variables, such as country of origin, the differences in outcomes between the Completers and Decliners are still significant, although to a lesser extent.

These results look quite promising for this type of service program. But are these differences due to the IHPI program or are they due to differences between the two groups of women that existed before their IHPI program involvement? As noted above, there were measurable difference between the acceptors and Decliners, differences which may affect future behaviors and the risk of future problem pregnancies. The groups also have more in common than not. They were both selected by the IHPI recruitment process over other eligible women as the ones most likely to have another problem pregnancy and/or delivery. Although there were differences between the two groups in terms of risk factors, both had high rates of problems known to adversely affect future pregnancies. The participants had higher rates of very low birthweight and prematurity at intake than did the Decliners, who in turn had higher rates of substance use and social problems. It is difficult to predict a priori which of these would have more of an influence on rates of future poor birth outcomes.

As with any human services program, there are important differences in program effectiveness from one woman to another, and from one sub-group of participants to another. For example, as seen earlier in this report, the participants born in the USA had much worse outcomes in their subsequent births than the non-USA clients. Explanation of these differences is beyond the scope of this analysis. But in order to improve program effectiveness, it is crucial to explain these irregularities.

Dissemination and Replication

During the last 5 years, Denver Health has launched several new case management programs modeled in part after the Interconception Health Promotion Initiative case management program. As of this date, these programs include the Community Voices Project, the Community Access Program (CAP), the ED Case Management Program, the County Jail or MODEL Program, and the Healthy Futures component of the Best Babies program. Although the programs all worked with different populations, they incorporated components of IHPI, including voluntary participation, individualized services tailored to the clients' identified needs, and use interdisciplinary teams of nurse and LCSW case managers with caseloads of about 25 clients. The case managers screen and access appropriate clients, assign Primary Care physicians and help clients access and navigate the Denver Health system. The clients and case managers work together to identify the issues and needs of the client, develop care plans based on client strengths, and then reassess and revise care plans as needed. The case managers also assist clients with accessing community and financial resources, help clients develop their problem-solving skills, address substance abuse issues, build relationships with the clients, and provide other types of support.

All of these new programs require that the eligible clients be Denver residents, over 18 years of age, have a prognosis of greater than six months and not be enrolled in any other case management programs. Referrals are accepted through the Denver Health system only, with the exception of the CAP program, which can accept referrals from ABC Medicaid and the Signal substance abuse treatment.

The differences in the eligibility criteria for each program are listed in the next few paragraphs.

Community Voices targets patients with three or more Denver Health inpatient admissions within a 12 months time frame, be under-insured or uninsured. Clients must be enrolled into the program while an inpatient at Denver Health. This program currently has a research component with randomized treatment and control groups.

Community Access Program (CAP) also targets patients who are high utilizers of services. Eligible clients have had three or more Denver Health visits or admissions to the Emergency Department, Walk-in Clinic, Detox or Hospital within the past 12 months. They must also be dually-diagnosed with two of the three following conditions:

- mental illness
- chronic medical condition and/or substance abuse
- be ABC Medicaid or receive Signal subsidy for substance abuse treatment

The **ED Program** targets clients with five or more Denver Health visits to the Emergency Department (ED) in the past 12 months and be under-insured or uninsured. The ED Program has two teams of case managers, whereas the other programs have one team each.

The **MODEL Program** is designed for soon-to-be released inmates in the Denver County Jail whose current charges are

misdemeanors, who have a chronic medical condition, and who have a co-occurring psychosocial issue, mental health issue or substance abuse history. They are enrolled in the program while still in the jail, and followed after their release. The MODEL Program has an outreach worker in addition to the case management team.

Healthy Futures Program is a modification of the Nurse Family Partnership (NFP) program, based on IHPI. Like IHPI, the program targets women who have had a poor birth outcome. However, clients are recruited during a subsequent pregnancy and, like NFP, are followed through the baby's second birthday. Unlike NFP, which is limited to first time mothers, this program is specifically designed for high risk multiparous women. The program also uses a blend of social workers and nurse case managers, and provides services for both the infant and the mother.

Last, but not least, the results of the IHPI program and its evaluation will be disseminated to interested parties through the professional literature. An article outlining the issues concerning the use of birth certificate data with low birthweight populations already has been completed (see the Appendix on page 173 for a summary), and several other articles regarding program services are planned. There are similar programs starting in other parts of the country, some funded by the Health Start Initiative. The authors have been in communication with some of these other programs.

Recommendations

Analysis and Evaluation

As a demonstration project, IHPI has laid important groundwork for the feasibility and value of case management programs for women at risk for future adverse pregnancy outcomes. The evaluation was primarily intended to provide useful, descriptive information on the program recruitment process, the content of program components delivered to this high risk group of women, and the potential impacts of these programs for these women. But the evaluation also helped to disclose some of the challenges that an analysis of a program of this type will likely face.

First, as a demonstration project, there were several modifications that had to be made in the first six months to better meet the needs of the target population and to resolve various unexpected roadblocks. These were, for example, changes in the criteria for admission into the program and changes in the various forms for data collection. Some of these changes had impacts on the evaluation, most notably, creating gaps in the data after changes were made in the forms. While changes of this nature are commonplace, it is best to keep them to a minimum to avoid confusing the data collection process and decreasing the sample sizes due to missing or incompatible data. While we did pilot-test the forms, the initial pilot group was not large enough to uncover all of the problems. The importance of adequate pilot testing to minimize these problems cannot be stressed enough, and should be seriously considered as a requirement for any demonstration project.

A second problem with demonstration projects is poorly defined or changing study questions. New programs too often define their study questions and specific hypotheses too broadly, especially if there is a lack of information on the nature of the problem or the study population. With the IHPI program, the definition of "success" has always been elusive. What constitutes a success for one woman may be a significant setback to another program participant. Grouping women together into a "successful" group becomes problematic because some of their outcomes and behaviors are completely opposite.

We faced a similar problem in quantifying a suitable risk summary for each client. There are many factors that contribute to a woman's overall risk for a repeat problematic birth outcome. Some of these have been well studied and valid risk ratios can be estimated, while others are still largely hypothetical. Combinations of several risk factors complicates the process of estimating the overall risk, as these are less empirically cased. In addition, some factors can be changed easily, such as taking folic acid, while others require more complex alterations, such as smoking cessation. Still others cannot be changed, such as previous birth outcomes. Because a program can only change factors that are malleable and addressed in its protocol, overall risk may not be the best measure of program success. Add to this the fact that several of the risk factors rely on the client's self-reported behavior or memory recall, and unreliable results can be the result.

Trying to estimate the overall risk level of each program participant is an important,

but extremely difficult task for these reasons. And trying to reliably estimate the risk of those who declined to participate in the program is impossible. However, this issue must adequately be addressed if a program of this nature is to clearly demonstrate a programmatic reduction in client risk level.

Third, when an innovative program becomes operational for the first time, new, pressing analysis questions typically arise during operations. Too easily, the original hypotheses can end up on the "back burner," displaced by new, more immediate questions. The analysis can easily lose its original direction if it is over-shadowed by too many unexpected queries. It is crucial to clearly delineate the primary study questions from the beginning, and relegate any new hypotheses to an "as available" time schedule.

Regarding the actual results of the IHPI evaluation, it is important to interpret the information in light of the evaluation's numerous limitations. Although the analyses described in this report provide consistent and compelling data on the potential benefits of the IHPI program, the fact that the IHPI women were likely to be at higher risk than the other Denver Health populations of women makes it difficult to demonstrate positive program effects for three reasons. First, it was difficult, if not impossible, to assemble a group of truly similar women for a comparison group. The absence of a strict, randomized, control group prevents us from making any definitive statements about the nature of the program's impacts. In this study, several comparison groups were examined in depth, and the one with the most similarities was selected, but there are still several important, significant differences with the impacts of these differences largely unknown.

Second, even if a strict control group were available, the nature of the IHPI "engagement" process for the participants and its impact on the risk-rating of the women poses an unexpected challenge to any outcome measure based on self-reported risks. For example, since smoking is self-reported, program participants may be less likely to report smoking behaviors after working with a case manager on smoking cessation, than controls who don't work with a case manager. Devising a valid method of evaluating the risk-rating of a control group without some sort of similar "engagement" process would be very challenging.

Third, the evaluation faced the challenge of overcoming a well-known statistical anomaly referred to as "regression toward the mean." Because the IHPI participants were at significantly higher risk at the beginning of the program, it is normal to expect that, by chance alone, their risk status would ameliorate to some extent over time. For women at the highest risk levels, it is much easier for them to evidence a decrease in their risk than to show an increase in it. When dealing with populations at the extremes of a distribution, such as birthweight (in this case), these factors must be taken into account when designing the program analysis.

The fourth limitation is a small sample size. While the overall study population is large enough for a wide variety of statistical tests, much of the analysis cannot use the entire population. For example, when examining changes in risk factors, only the subset of clients who completed the 12-month survey can be included. Likewise, when future pregnancy outcomes are explored, only a small subset of women during the follow-up period became

pregnant, and only a subset of these actually delivered. And even though all of these women initially had low birthweight babies, the majority will not have another low birthweight baby in their subsequent pregnancy — with or without the program. Each of these divisions reduces the total number of cases that are available for the evaluation, and decreases the power and reliability of the statistical tests and comparisons. For future studies, it is important to maximize the initial sample size or extend the study period to address these and other important sub-analyses.

Due to these, and other issues, we must use caution in generalizing IHPI findings. Because of the selective nature of the women approached and enrolled in the IHPI program, program evaluation findings can not be generalized to women with different perinatal and lifestyle risks. The results from this study represent a unique group — urban women, mostly young and primarily Hispanic, receiving care from a public hospital in Colorado, delivering low birthweight babies and having a particular mix of social and psychological problems. As a result, these data may not be representative of other groups of women in different locations, with a different mix of issues and under different situations.

Program and Services

In the first years of the program, we modified several aspects of the program based on our experiences. We initially sought to recruit all women who met the low birthweight eligibility criteria. However, there were many more potential clients than we could serve. During the first six months, we found that women with marginally low birthweight babies (that is, between 2,200 and 2,500 grams), and no risk factors, were not very interested in the program. We then narrowed the recruitment to higher risk women who had potentially modifiable risk factors.

We also learned that the home visitation model was essential for our success in recruiting, retaining and effectively serving clients. Our case managers needed to make a major investment of time and effort in the beginning stages to engage women and develop a working relationship. We have developed and are continuing to refine a case management, client relationship model that describes the process of promoting health while also promoting empowerment of the woman. We have learned that patience and a long term (one to two years) relationship are often necessary to see the health and personal self-efficacy changes realized.

With most women, we have found a time limited "window of opportunity" during which we have the optimum chance for engagement. Any pregnancy can be defined as a life crisis in the sense of its being an irrevocable turning point, and it is even more anxiety provoking when there has been a poor outcome. This is the window of opportunity for establishing a bond with these women. We found that if we haven't established a good working relationship by six weeks to three months post-crisis, there will be a much higher dropout rate.

The most significant factor for recruitment success and quick engagement is making face-to-face contact while the woman is still in the hospital. Our data have shown that we have a much higher enrollment rate when we can make that personal connection. When a face-to-face visit is not accomplished the next best alternative is to arrange to visit the woman in her home the next day or as soon as is

possible. We had less success recruiting these women over the telephone, with the worst success in mailing these women a recruitment letter.

Summary

The IHPI project demonstrated several significant conclusions about working with a high risk maternity population.

It is straightforward to identify women who are at risk for future poor outcomes on the basis of risk factors which are easily ascertained from the medical record (e.g. infant birthweight, OB history, behavioral risk factors such as substance use.)

Based on our experience, women respond best to a recruitment strategy that involves face-to-face contact with a case manager. Other predictors of successful recruitment appear to be related to the clients' sense of vulnerability, and include factors such as significant complications of pregnancy, poor outcomes such as extreme prematurity or NICU admission, and social factors such as immigrant status. Women with social problems and substance abuse are more leery of participating in such programs. Other nurse visitation programs have demonstrated that women with a first pregnancy are most receptive to interventions because of the new experience of pregnancy, and their sense of vulnerability. The conventional wisdom is that such programs are less successful with multiparous women because they have already learned how to be a mother. Perhaps the birth of a fragile baby, or the experience of a difficult pregnancy also creates a sense of vulnerability and a window of opportunity for change in behaviors.

Program design should be flexible and tailored to the individual client needs. It also needs to be able to accommodate crisis needs at the outset of the program, which allows a relationship of trust to build to the extent that the client becomes receptive to the educational and health promotion messages and improvement in resiliency that the program is also designed to instill. The combination of professional social workers and nurses in the case management mix allows the case managers from the two professions to learn from each other and thereby offer a wider range of services to the clients.

Although there were significant differences between the program and the comparison groups, at intake, both groups had high levels of risk factors known to be associated with poor pregnancy outcomes. It would be difficult to predict, a priori, which would be mostly strongly associated with future poor outcomes. Based on studies in the literature, we would expect that patients in both groups would have over a 20% chance of repeat low birthweight in subsequent pregnancy.

Women who participated in the program had several important differences:

1. Improved compliance with medical care and contraception use in the post-partum period, relative to the comparison group.

2. For those who had another pregnancy, there was a delay of over three months to conception, on average, in the participants compared to the comparison group.

3. For those who delivered, there was better compliance with prenatal care, lower rates of low birthweight and NICU admission -- even if the baby was low birthweight.

There was an additional subset of women who chose to participate in the program in order to qualify for financial assistance in getting a tubal ligation. Others received assistance for other methods of birth control. This finding highlights the fact that low income women may have barriers to receiving contraceptive care once their health insurance lapses at the end of the post-partum period.

The study also points out the effects of gaps in medical care in the interconception period. Virtually all of the women in the study group were either on Medicaid or uninsured. Of those on Medicaid, most lose their coverage after the 60 day post-partum period. Thus there is a group of high risk women in need of medical and family planning services who are likely to find significant barriers to health care in the critical interconception period. It is possible that some of the benefits of the program could be achieved by providing appropriate medical care during this period.

The Interconception Health Promotion Initiative is a unique intervention targeting a group of women who have been documented to be at high risk for poor reproductive outcomes. Based on the findings from the demonstration group, in both the pre-post analysis and the comparison group analysis, it is clear that there is potential for this approach to have a significant impact on what is a very costly problem for society. It is an expensive program, requiring intensive case management over at least a year's time. Fortunately, if the model prevents NICU admissions at the same rate as in this demonstration project, the potential for realizing the cost-benefit in a fairly short time is high.

In the current state of tighter margins for funding social interventions, it is unlikely that interventions similar to IHPI would be incorporated into Medicaid or other health insurance programs without a more rigorous demonstration of efficacy. That would require funding to do a randomized control trial of the model.
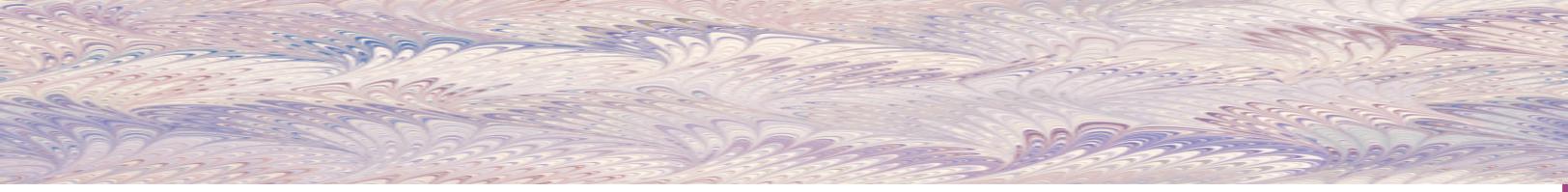
APPENDIXES

APPENDIXES

The Appendix consists of the following sections:

- IHPI program Eligibility/Ineligibility criteria -- page 126.

- Bibliography of cited material in this report -- page 128.

- Reference list of materials used in the program and in the analysis of the IHPI program -- page 129.

- The Surveys section provides a sample of some of the forms that we used by the IHPI program. There were several forms used during the course of the project. A Recruitment form was completed to determine if the case met the Program's eligibility criteria. If the woman was eligible and there was a slot available in the program, the woman was contacted by the program. If the woman agreed to participate, a screening meeting was scheduled and an Intake form was completed at that time. The Intake form covers much more detailed information than the Recruitment form pertaining to the woman's medical, psychological and social risks and resources. Two additional forms were used to collect data on the program participants at later dates. The first, called the Six-month form, is very similar to the Intake form and was completed after the client was in the program for approximately six months. A 12-month form was also used on women who remained in the program for that length of time. This is nearly identical to the 6-month form and is also used as an Exit form if the woman completes the program before the end of the 12 month period.
In addition, most of the forms changed at some point during the course of the project to meet the needs of the case mangers and the research staff. Most of the changes were minor such as adding or modifying the possible responses to a question, rather than adding or removing entire questions -- page 132.

- The Tabled Data section provides more complete data results than those provided in the Results section -- page 159.

- The Birth Certificate section details the various discrepancies that were found in the Birth Certificate data through a review of the medical charts at Denver Health-- page 173.

IHPI Eligibility/Ineligibility Criteria

To be eligible for participation in the IHPI program, at least one of the following conditions is required:

- Infant is low birthweight (<than 2500 grams), or
- Preterm (20 to 36 6/7ths weeks gestational age); or
- Late term fetal demise (>20 weeks); or
- Congenital defect; or
- Baby admitted to the ICU

In addition, the women must have the possibility of another pregnancy:

- Mother may become pregnant in the future (no tubal ligation or hysterectomy etc.)

In addition, there must be a likelihood of improvement:

- Interconception interventions are likely to reduce her risk for another poor outcome (for example low birthweight may be due to multiple gestation and is not eligible).

Women who meet the above criteria will not be eligible for enrollment into the Interconception program for the following reasons.

- Women who are enrolled in a similar home visitation program.
- Women who speak a language other than English or Spanish.
- Women who are incarcerated and deliver a high-risk baby are not eligible for the program as they would not be able to participate in the interventions. If the woman is to be released from jail within three months of her delivery she would be considered for the program.
- Women who are deaf, blind or severely handicapped will be considered on an individual basis, depending on their means of communication.

After this screening the following factors are considered in determining priority to offer enrollment when there are more eligible candidates for the program than can be accommodated by case manager caseloads:

- Prior fetal or infant death in first year of life
- Recent or current alcohol use
- Recent or current street drug use
- Recent or current tobacco use

- Health condition indicating high risk pregnancy (i.e., lupus, sickle cell, cardiac disease, current or Hx of circlage, Hx of pprom, HIV Positive, Pre-existing diabetes (Type I or Type II) or other condition)

- History of 2 or more SABs

- History of or current domestic violence or abuse

- History of sexual abuse

- History of or current maternal psychiatric diagnosis including depression

- High life stress or lack of support systems

- Last birth within prior 12 mos. of conception

- Maternal cognitive or developmental disability

- Child currently in child protective custody or history of termination of parental rights

- Homelessness

- Age 18 or younger or over age 35 at delivery

- Pre-pregnant weight under 100 lbs or inadequate weight gain (i.e., weight gain, < 10 lbs. by 20 wks, then < 2 lbs./month)

- Less than age appropriate education

- Not married (legal or common law)

- No or scant prenatal care

In addition to prioritizing recruitment efforts by presenting risk factors, there are three overarching questions that give additional guidance and structure to the decision whether to recruit and the decision of how much time and effort to expend in reaching out to contact the eligible but elusive woman.

- What is the risk of repeat poor pregnancy outcome if her risk factors aren't mediated? Was the poor outcome etiology obvious? Was there something the woman did or did not do that could increase her chance for a healthier outcome with this pregnancy?

- Is the woman at risk of unplanned pregnancy with a short interconception interval? This significantly increases the risk of another poor outcome and also indicates issues with lack of knowledge of preconception health or contraception issues. She may need case manager assistance for interpretation of clinic education, or for addressing barriers to receiving care or contraceptives.

- The third and most decisive question we consider is the degree to which her life circumstances make it difficult for her to attend to her health care. Included in this area are psychosocial issues such as family violence, a special needs child and inadequate support, learning disabilities, inability to access social services and so forth.

Bibliography

1. Yankauer A. What infant mortality tells us. Am J Public Health 1990;80:653-4.

2. MacDorman MF, Atkinson JO. Infant mortality statistics from the 1997 period linked birth/infant death data set. National Vital Statistics Reports. Centers for Disease Control and Prevention. 47(23).July 30, 1999.

3. Singh GK, Yu SM. Infant mortality in the United States: Trends, differentials and projections, 1950 throught 2010. Am J Public Health 1995;85:957-64.

4. Olds DL, Henderson CR, Tatelbaum R. Prevention of intellectual impairment in children of women who smoke cigarettes during pregnancy. Pediatrics 1994;93:228-33.

5. Secker-Walker RH, Solomon LJ, Flynn BS, Skelly JM, Mead PB. Reducing smoking during pregnancy and postpartum: Physician's advice supported by individual counseling. Prev Med 1998;27:422-30.

6. Tipping the Scales: Weighing in on solutions to the low birth weight problem in Colorado. Colorado Department of Public Health and Environment, August 2000.

7. Hillier SL, Martius J, Krohn M, Kiviat N, Holmes KK, Eschenbach DA. A case-control study of chorioamnionic infection and histologic chorioamnionitis in prematurity. N Engl J Med 1988;319:972-8.

8. Kurki T, Sivonen A, Renkonen O-V, Savia E, Ylikorkala O. Bacterial vaginosis in early pregnancy and pregnancy outcome. Obstet Gynecol 1992;80:173-7.

9. Hay PE, Lamont RF, Taylor-Robinson D, Morgan DJ, Ison CA, Pearson J. Abnormal bacterial colonization of the genital tract and subsequent preterm delivery and late miscarriage. Br Med J 1994;308:295-8.

10. Charles AG, Cohen S, Kass MB, et al. Asymptomatic gonorrhea in prenatal patients. Am J Obstet Gynecol 1981;57:479-82.

11. Loomis LW, Martin MW. The interconception health promotion initiative: A demonstration project to reduce the incidence of repeat LBW deliveries in an urban safety net hospital. Fam Commun Health 2000;23(3):1-16.

12. Bandura A. Social Learning Theory. 1977, Englewood Cliffs, New Jersey: Prentice Hall.

13. Mills R, Spittle EB. The Health Realization Primer: Empowering Individuals and Communities, 1998.

References

Alexander GR, Weiss J, Hulsey TC, Papiemik E. Preterm Birth Prevention: An Evaluation of Programs in the United States. Birth. 1991;18(3):160-169.

Baldwin LM, Larson EH, Connell FA, et al. The Effect of Expanding Medicaid Prenatal Services on Birth Outcomes. American Journal of Public Health. 1998;88(11):1623-1629.

Basso O, Olsen J, Knudsen LB, Christensen K. Low birth weight and preterm birth after short interpregnancy intervals. American Journal of Obstetrics and Gynecology. 1998;178(2):259-63.

Bedics BC. Nonuse of Prenatal Care: Implications for Social Work Involvement. Health and Social Work. 1994;19(2):84-92.

Brown SS, Eisenberg L, eds. Demography of Unintended Pregnancy. In: The Best Intentions. Washington, D.C.: National Academy Press; 1995.

Brown SS, Eisenberg L, eds. Basic Requirements: Contraceptive Knowledge and Access. In: The Best Intentions. Washington, D.C.: National Academy Press; 1995.

Bryce RL, Stanley FJ, Garner JB. Randomized Controlled Trial of Antenatal Social Support to Prevent Preterm Birth. British Journal of Obstetrics and Gynaecology. 1991;98:1001-1008.

Edwards CH, Cole OJ, Oyemade UJ, et al. Multiple Factors as Mediators of the Reduced Incidence of Low Birth Weight in an Urban Clinic Population. Journal of Nutrition. 1994;124(6):927S-935S.

Edwards CH, Cole OJ, Oyemade UJ, et al. Maternal Stress and Pregnancy Outcomes in a Prenatal Clinic Population. Journal of Nutrition. 1994;124(6):1006S-1021S.

Folberg J, Taylor A. Counseling Concepts for Developing Mediation Skills. In: Mediation: A Complete Guide to Resolving Conflicts Without Litigation. San Francisco: Jossey-Bess Publishing; 1984.

Goldenberg RL, Andrews WW. Editorial: Intrauterine Infection and Why Preterm Prevention Programs Have Failed. American Journal of Public Health. 1996;86(6):781-783.

Goldenberg RL, Rouse DJ. Prevention of Preterm Birth. New England Journal of Medicine. 1998;339(5):313-320.

Goldenberg RL, Iams JD, Mercer BM, et al. The Preterm Prediction Study: The Value of New vs Standard Risk Factors in Predicting Early and All Spontaneous Preterm Births. American Journal of Public Health. 1998;88(2):233-238.

Gorski PA. Perinatal Outcome and The Social Contract - Interrelationships Between Health and Humanity. Journal of Perinatology. 1998;18(4):297-301.

Haas JS, Udvarhelyl S, Morris CN, Epstein AM. The Effect of Providing Health Coverage to Poor Uninsured Pregnant Women in Massachusetts. JAMA. 1993;269(1):87-91.

Hedegaard M, Henricksen TB, Secher NJ, Hatch MC, Sabroe S. Do Stressful Life Events Affect Duration of Gestation and Risk of Preterm Delivery? Epidemiology 1996;7(4):339-345

Holzman C, Paneth N. Preterm Birth: From Prediction to Prevention. American Journal of Public Health. 1998;88(4):183-184.

Iams J. Prevention of Preterm Birth. New England Journal of Medicine. 1998;338(1):54-55.

Klerman LV, Cliver SP, Goldenberg RL. The Impact of Short Interpregnancy Intervals on Pregnancy Outcomes in a Low-Income Population. American Journal of Public Health. 1998;88(8):1182-1185.

Kogan MD, Alexander GR, Kotelchuck M, Nagey DA. Relation of the Content of Prenatal Care to the Risk of Low Birth Weight. JAMA. 1994;271(17):1340-1346.

Lang JM, Lieberman E, Cohen A. A Comparison of Risk Factors for Preterm Labor and Term Small-for-Gestational-Age Birth. Epidemiology. 1996;7(4):369-76.

Meis PJ, Goldenberg RL, Mercer BM, et al. The Preterm Prediction Study: risk factors for indicated preterm births. Maternal-Fetal Medicine Units Network of the National Institute of Child Health and Human Development. American Journal of Obstetics and Gynecology. 1998;178(3):562-7.

Newton RW, Hung LP. Psycho-social stress in pregnancy and its relation to low birth weight. British Medical Journal. 1984;288(4).

Norbeck JS, Anderson NJ. Psycho-social Predictors of Pregnancy Outcomes in Low Income, Black, Hispanic and White Women. Nursing Research. 1989;38(4):204-209.

Norbeck JS, DeJoseph JF, Smith RT. A Randomized Trial of an Empirically-Derived Social Support Intervention to Prevent Low Birthweight Among African American Women. Social Science Medicine. 1996;43(6):947-954.

Nordentoft M, Lou HC, Hansen D, Nim J, et al. Intrauterine Growth Retardation and Premature Delivery: The Influence of Maternal Smoking and Psychosocial Factors. <u>American Journal of Public Health.</u> 1996;86(3):347-353.

Olds DL, Kitzman H. Review of Research on Home Visiting for Pregnant Women and Parents of Young Children. <u>The Future of Children.</u> 1993;3(3).

Oleske DM, Branca ML, Schmidt JB, Ferguson R, Linn ES. A Comparison of capitated and fee-for-service Medicaid reimbursement methods on pregnancy outcomes. <u>Health Services Resource.</u> 1998;33(1):55-73.

Perkocha VA, Novotny TE. The Efficacy of Two Comprehensive Perinatal Programs on Reducing Adverse Perinatal Outcomes. <u>American Journal of Preventive Medicine.</u> 1995;11(3 suppl):21-29.

Piper JM, Ray WA, Griffin MR. Effects of Medicaid Eligibility Expansion on Prenatal Care and Pregnancy Outcome in Tennessee. <u>JAMA.</u> 1990;264(17):2219-2265.

Prochaska JO, DiClemente CC, Norcross JC. In Search of How People Change. <u>American Psychologist.</u> 1992;47(9):1102-1114.

Ray WA, Mitchel, Jr. EF, Piper JM. Effect of Medicaid expansions on preterm birth. <u>American Journal of Preventive Medicine.</u> 1997;13(4):292-7.

Stevens-Simon C, Orleans M. Low-Birthweight Prevention Programs: The Enigma of Failure. <u>Birth</u> 1999;26(3):184-191

Williamson HA, Le Fevre M, Hector, M. Association between Life Stress and Serious Perinatal Complications. <u>Journal of Family Practice</u> 1989; 29(5): 489-496.

Winkvist A, Mogren I, Hogberg U. Familial patterns in birth characteristics: impact on individual and population risks. <u>International Journal of Epidemiology.</u> 1998;27(2):248-

Sample IHPI surveys

RECRUITMENT FORM

TODAY'S DATE [   ]

CHART NUMBER [   ] STUDY NUMBER [   ] CASE MANAGER [   ]

LAST NAME [   ] FIRST NAME [   ]

SOCIAL SECURITY NUMBER [   ]

BABY'S BIRTHDATE [   ] BABY'S CHART NUMBER [   ] MOM'S BIRTHDATE [   ]

MM/DD/YYYY   MM/DD/YYYY

MARITAL STATUS?
- ○ SINGLE ○ DIVORCED
- ○ MARRIED ○ WIDOWED
- ○ SEPARATED ○ UNKNOWN/OTHER

RACE
- ○ AMER INDIAN
- ○ ASIAN
- ○ AFRICAN AMER
- ○ CAUCASIAN
- ○ OTHER
- ○ UNKNOWN

HISPANIC?
- ○ NO ○ YES

ETHNICITY?
- ○ MEXICAN
- ○ OTHER
- ○ UNKNOWN

BORN IN THE USA?
- ○ NO ○ YES

SOURCE OF PAYMENT:
- ○ MEDICAID ○ COLO ACCESS
- ○ MEDICAID PENDING ○ CICP
- ○ MEDICAID POTENTIAL ○ SELF
- ○ EMER MEDICAID ○ OTHER

LANGUAGE?
- ○ ENGLISH
- ○ SPANISH
- ○ OTHER

OCCUPATION?
- ☐ HOMEMAKER
- ☐ STUDENT
- ☐ EMPLOYED

RECRUITMENT CONTACT ○ FACE TO FACE ○ OTHER

REASON PATIENT IS ELIGIBLE FOR INTERCONCEPTION?
- ○ LBW BABY ○ FETAL DEMISE ○ CONGENITAL ANOMALY

RECRUITMENT OUTCOME
- ○ ACCEPTS ○ NO RESPONSE ○ LATE REFUSER
- ○ REFUSES ○ COULDN'T REACH ○ PENDING

HIGH SCHOOL GRADUATE?
- ○ NO ○ SOME HS
- ○ HS GRAD ○ UNKNOWN
- ○ GED

ANY POST HIGH SCHOOL EDUCATION?
- ○ NO
- ○ YES
- ○ UNKNOWN

Revised 8/99

1

RECRUITMENT FORM

PAST PREGNANCIES (IF UNKNOWN ENTER "-1")

TOTAL PREGANCIES (INCLUDING CURRENT)

FULL TERM PREGNANCIES

PREMATURE

ABORTIONS INDUCED

ABORTIONS SPONTANEOUS

ECTOPICS

MULTIPLE BIRTHS

LIVING CHILDREN

DATE OF PREVIOUS PREGNANCY OUTCOME

20 WEEKS = SAB;   21 WEEKS = FETAL DEATH ROUND UP OR DOWN

PREVIOUS FETAL DEMISE?
○ NO   ○ YES

PREVIOUS LBW INFANT?
○ NO   ○ YES

DEMISE 1 DATE

DATE 1

EGA 1

EGA 1

WT(GRAMS) AT BIRTH 1

DEMISE 2 DATE

DATE 2

EGA 2

EGA 2

WEIGHT (GRAMS) AT BIRTH 2

DEMISE 3 DATE

DATE 3

EGA 3

EGA 3

WEIGHT (GRAMS) AT BIRTH 3

POSITIVE FAMILY HISTORY FOR ANY GENETIC DEFECTS?
○ NO   ○ YES   ○ UNKNOWN

INDEX DELIVERY

DID PATIENT RECEIVE PRENATAL CARE FOR THIS PREGNANCY?

○ NO PRENATAL CARE   ○ YES ELSEWHERE

○ YES AT DH   ○ DH AND OTHER SITE

TOTAL NUMBER
OF AP VISITS?

IF PRENATAL CARE WAS AT DH, WHICH SITE?

DATE OF OB INTAKE

DATE OF FINAL EDC

2

RECRUITMENT FORM

INFECTION HISTORY CAN BE FOUND ANYWHERE IN CHART

INFECTION HISTORY DURING PREGNANCY				IF YES, WAS INFECTION TREATED BEFORE DELIVERY?		
RPR	○ NO	○ YES	○ NO INFO	○ NO	○ YES	○ UNDETERMINED
HBsAG	○ NO	○ YES	○ NO INFO			
HIV	○ NO	○ YES	○ NO INFO	○ NO	○ YES	○ UNDETERMINED
UTI	○ NO	○ YES	○ NO INFO	○ NO	○ YES	○ UNDETERMINED
GC	○ NO	○ YES	○ NO INFO	○ NO	○ YES	○ UNDETERMINED
CHLAMYDIA	○ NO	○ YES	○ NO INFO	○ NO	○ YES	○ UNDETERMINED
PPD	○ NO	○ YES	○ NO INFO			
BV	○ NO	○ YES	○ NO INFO	○ NO	○ YES	○ UNDETERMINED
GBS	○ NO	○ YES	○ NO INFO	○ NO	○ YES	○ UNDETERMINED
TRICHOMONAS	○ NO	○ YES	○ NO INFO	○ NO	○ YES	○ UNDETERMINED
HPV	○ NO	○ YES	○ NO INFO			
HSV	○ NO	○ YES	○ NO INFO	○ NO	○ YES	○ UNDETERMINED

OTHER INFECTION(S)? [   ]

PREGNANCY COMPLICATIONS (IN AP RECORD)

☐ NO PROBLEMS
☐ PLACENTA PREVIA
☐ VAGINAL BLEEDING, UPSPECIFIED AFTER 12 WKS
☐ INCOMPETENT CERVIX
☐ CHRONIC HTN, PREEXISTING

☐ TRANSIENT HTN
☐ RH/OTHER ISOIMMUNIZATION
☐ OBESITY
☐ PREECLAMPSIA
☐ DIABETES, GESTATIONAL

☐ DIABETES, OTHER
☐ POOR WEIGHT GAIN (PER PROVIDER NOTE)
☐ PYELONEPHRITIS
☐ ASTHMA
☐ OTHER PROBLEM

IF OTHER PROBLEM, WHAT WAS PREGNANCY PROBLEM(S)? [   ]

3

RECRUITMENT FORM

PRE-PREG WT	FIRST RECORDED WT	LAST RECORDED WT
☐	☐	☐

DID PATIENT HAVE ANY ANTEPARTUM ADMISSIONS?   ○ NO   ○ YES

ADMIT DATE1	PRIMARY DIAGNOSIS	# INPATIENT DAYS
ADMIT DATE 2	PRIMARY DIAGNOSIS	# INPATIENT DAYS
ADMIT DATE 3	PRIMARY DIAGNOSIS	#INPATIENT DAYS

PAST = before pregnancy   CURRENT = during pregnancy   INDETERMINATE = inconsistent info

ALCOHOL USE	SMOKING	STREET DRUGS	DOMESTIC VIOLENCE
○ NO	○ NO	○ NO	○ NO
○ PAST	○ PAST	○ PAST	○ PAST
○ CURRENT	○ CURRENT	○ CURRENT	○ CURRENT
○ INDETERMINATE	○ INDETERMINATE	○ INDETERMINATE	○ INDETERMINATE
○ NO INFO	○ NO INFO	○ NO INFO	○ NO INFO

WHICH STREET DRUG(S)? _____

PSYCHIATRIC PROBLEMS DURING PREGNANCY

☐ NO PROBLEMS   ☐ DEPRESSION
☐ SCHIZOPHRENIA   ☐ OTHER PSYCH PROBLEM

IF OTHER PROBLEM, WHAT WAS THE
PSYCHIATRIC PROBLEM(S)? _____

ADDITIONAL PSYCHOSOCIAL PROBLEMS DURING PREGNANCY

☐ NO PSYCHOSOCIAL PROBLEMS   ☐ CUSTODY ISSUE W/ DDSS
☐ HOMELESSNESS   ☐ CLINICAL SOCIAL WORK REFERRAL
☐ INCARCERATION OF SELF   ☐ OTHER PSYCHOSOCIAL PROBLEM
☐ INCARCERATION CHILD'S FATHER

IF OTHER PROBLEM, WHAT WAS
PSYCHOSOCIAL PROBLEM(S)? _____

DID PATIENT TRANSFER OUT OF DH SYSTEM BEFORE DELIVERY?
○ NO   ○ YES

4

RECRUITMENT FORM

LABOR AND DELIVERY RECORD

DATE OF DELIVERY [   ]   TYPE OF DELIVERY

○ VAGINAL   ○ C-SECTION

BIRTHWEIGHT (in grams) [   ]   GENDER: ○ MALE   ○ FEMALE

APGAR AT 1 MIN [   ]   APGAR AT 5 MIN [   ]   EGA AT BIRTH [   ]

COMPLICATIONS WITH LABOR/DELIVERY
(FROM LABOR AND DELIVERY RECORD)

☐ NO PROBLEMS   ☐ HELLP SYNDROME

☐ ABRUPTION   ☐ POST TERM PREG (>42 WKS)

☐ FETAL DISTRESS   ☐ POLYHYDRAMNIOS

☐ CHORIOAMNIONITIS   ☐ OLIGOHYDRAMNIOS

☐ PRETERM LABOR   ☐ IUGR

☐ PLACENTA PREVIA   ☐ PROLONGED ROM(18HRS OR MORE)

☐ PREECLAMPSIA   ☐ PRETERM PROM (<37 WKS)

☐ ECLAMPSIA   ☐ OTHER LABOR PROBLEM

☐ POS TOX SCREEN COCAINE, AMP, OPIATES, BARB

IF OTHER PROBLEM, WHAT WAS
LABOR PROBLEM(S)?   [   ]

CONGENITAL ANOMALIES

☐ NO PROBLEMS   ☐ SPINA BIFIDA/MENINGOMYELOCELE

☐ ANENCEPHALY   ☐ MICROCEPHALY

☐ HYDROCEPHALUS   ☐ CARDIAC MALFORMATION

☐ OTHER CNS ANOMALIES   ☐ ANAL ATRESIA/STENOSIS

☐ OTHER CIRC/RESPIR ANOMALIES   ☐ OMPHALOCELE/GASTROSCHISIS

☐ TRACHEO-ESOPHAGEAL FISTULA   ☐ GENITAL MALFORMATION

☐ OTHER GASTROINTESTINAL   ☐ OTHER UROGENITAL ANOMALIES

☐ RENAL AGENESIS   ☐ POLYDACTYLY/SYNDACTYLY/ADACTYLY

☐ CLEFT LIP/PALATE   ☐ CONGENITAL HIP DISLOCATION

☐ CLUB FOOT   ☐ OTHER MUSCULOSKELETAL

☐ DIAPHRAGMATIC HERNIA   ☐ OTHER CHROMOSOME ANOMALIES

☐ DOWN'S SYNDROME   ☐ OTHER

5

RECRUITMENT FORM

BIRTH OUTCOME: ○ LIVE BIRTH   ○ FETAL DEATH

WAS BABY NONVIABLE?   ○ NO   ○ YES

DID BABY DIE IN HOSPITAL?   ○ NO   ○ YES

DATE OF HOSPITAL DEATH   [   ]

WAS BABY TRANSFERRED?   ○ NO   ○ YES

WAS BABY ADMITTED TO ICU?   ○ NO   ○ YES

INCLUDE NICU AND ANY DAYS TRANSFERRED TO ANOTHER FACILITY OR WELL SIDE

TOTAL LOS   [   ]

BABY WAS DISCHARGED TO:
○ HOME   ○ FOSTER CARE
○ ADOPTION   ○ DDSS SUPERVISED
○ DDSS   ○ OTHER

6

IHPI/forms/Intake Interview
09/30/99

DENVER HEALTH AUTHORITY

Interconception Health Promotion Initiative

INTAKE INTERVIEW
ENGLISH

Study ID#:_____

Interviewer:_____

Date:_____

SECTION DM. DEMOGRAPHICS

I would like to ask you some questions about yourself, your household, and your housing.

How long have you lived in the Denver Metro area?

How long have you lived at your current address?

DM5. How many times have you moved in the last year?

DM6.   Were you born in the USA?
☐ 1. Yes....**(DM8)**   ☐ 2. No

How long have you lived in the USA?

DM8.   What is your current marital status?
☐ 1. Single, never married   ☐ 4. Divorced
☐ 2. Legally Married   ☐ 5. Separated
☐ 3. Common Law Marriage   ☐ 6. Widowed

DM9.   How many people live in your household?

DM10. How many rooms are there in your household(Do not count bathrooms, porches, halls)?

Marital/Relationship Status
Review Marital Status

DM11. Do you currently have a boyfriend/husband?
☐ 1. Yes   ☐ 2. No

How long have you and your husband/boyfriend been together?

DM13. Is your husband/current boyfriend the father of this baby?
☐ 1. Yes   ☐ 2. No   ☐ 3. Don't Know

Do you know who the father of the baby is?

Does the father of the baby live in the household?

How often do you usually see or talk to the baby's father?

Can you count on the baby's father to help you?

Are you and the baby's father related by blood in any way?

DM19. Was the father of the child born in the USA?
☐1. Yes   ☐2. No

DM20. What is the race of the child's father?
☐1. American Indian   ☐5. Hispanic/Mexican
☐2. Asian   ☐6. Hispanic/Other
☐3. African American   ☐7. Other_____
☐4. Caucasian   ☐8. Unknown

2

HHANES Acculturation Scale

DM21. What language do you speak?
- ☐ 1. Spanish only
- ☐ 2. Mostly Spanish, some English
- ☐ 3. Spanish and English about equally
- ☐ 4. Mostly English, some Spanish
- ☐ 5. English only

DM22. What language do you prefer?
- ☐ 1. Spanish only
- ☐ 2. Mostly Spanish, some English
- ☐ 3. Spanish and English about equally
- ☐ 4. Mostly English, some Spanish
- ☐ 5. English only

DM23. What language do you read better?
- ☐ 1. Reads Spanish only
- ☐ 2. Reads Spanish better than English
- ☐ 3. Reads Spanish and English equally well
- ☐ 4. Reads English better than Spanish
- ☐ 5. Reads English only

DM24. What Language do you write better?
- ☐ 1. Writes Spanish only
- ☐ 2. Writes Spanish better than English
- ☐ 3. Writes Spanish and English equally well
- ☐ 4. Writes English better than Spanish
- ☐ 5. Writes English only

DM25. What ethnic identification do you use?
- ☐ 1. Mexican
- ☐ 2. Chicano
- ☐ 3. Mexican-American
- ☐ 4. Spanish, Spanish-, Latin-, Hispanic-American
- ☐ 5. Anglo or other

DM26. What ethnic identification does/did your mother use?
- ☐ 1. Mexican
- ☐ 2. Chicano
- ☐ 3. Mexican-American
- ☐ 4. Spanish, Spanish-, Latin-, Hispanic-American
- ☐ 5. Anglo or other

DM27. What ethnic identification does/did your father use?
- ☐ 1. Mexican
- ☐ 2. Chicano
- ☐ 3. Mexican-American
- ☐ 4. Spanish, Spanish-, Latin-, Hispanic-American
- ☐ 5. Anglo or other

DM28a. Where were you born?
- ☐ 1. Born in Mexico
- ☐ 2. Not born in Mexico, one or both parents born in Mexico
- ☐ 3. Not born in Mexico, neither parent born in Mexico

DM28b. Where was your mother born?
- ☐ 1. Born in Mexico
- ☐ 2. Not born in Mexico, one or both parents born in Mexico
- ☐ 3. Not born in Mexico, neither parent born in Mexico

DM28c. Where was your father born?
- ☐ 1. Born in Mexico
- ☐ 2. Not born in Mexico, one or both parents born in Mexico
- ☐ 3. Not born in Mexico, neither parent born in Mexico

3

Education/Employment/Income

Now I'd like to ask some questions about school and work, regarding you and your husband/partner. These first questions are about your husband/partner.
IF NO HUSBAND/PARTNER, GO TO DM35

DM29. Is your husband/partner a high school graduate?
☐1. Yes   ☐2. No   ☐3. No, but have GED

DM31. Is your husband/partner currently working?
☐1. Yes   ☐2. No-Out of work
☐3. No-Seasonal employee
☐4. No-Disabled
☐5. No-Incarcerated
☐6. No-Other:

What type of work does he do?

DM35. Are you a high school graduate?
☐1. Yes   ☐2. No   ☐3. No, but have GED

Sources of Income	Yes	No
DM38a. Employment	☐1	☐2
DM38b. AFDC	☐1	☐2
DM38c. Workman's Compensation	☐1	☐2
DM38d. Disability (e.g. SSI, SSDI)	☐1	☐2
DM38e. Other	☐1	☐2
Explain:		

DM39. Health Insurance (at time of intake interview)?
☐1. Colorado Access
☐2. Medicaid (not Colorado Access)
☐3. Emergency Medicaid
☐4. Commercial Insurance
☐5. Self Pay (Medically Indigent)
☐6. Self Pay Community Health Service
☐7. Self Pay Full Cost
☐8. Other
Explain:

IF FETAL DEMISE, GO TO DM42

DM40. Since you baby was born, have you applied for assistance from the DSS(not counting Medicaid)?
☐1. Yes   ☐2. No

DM42. Did you work during your recent pregnancy?
☐1. Yes   ☐2. No

How far into your pregnancy did you work?   (weeks/months)

Did you stop working during your pregnancy because of complications? If yes, identify.

How likely are you to return to or find work within six months? Would you say…

4

Are you satisfied with the level of education you have achieved so far?

Do you plan to continue your education or go back to school?

Are you currently enrolled in school or a vocational or educational program?

If you wanted to return to work or school, do you think that child care would be a problem?

Now I want to ask you a few questions about your safety.

DM52. Is there a gun in your home?
☐1. Yes…**(DM54)**   ☐2. No

DM53. Do you know where you could get a gun if you wanted one?
☐1. Yes   ☐2. No

DM54. Do you feel safe in your neighborhood?
☐1. Yes   ☐2. No

SECTION OH. OBSTETRIC HISTORY

Now I have some questions about your pregnancy history. Please include information regarding recent pregnancy for the first table. You do not need to answer any questions that make you uncomfortable but I think most of our questions are fairly easy to answer.

Number		Notes
OH1.	Total Pregnancies (if one, skip rest of table)	
OH2.	Spontaneous Abortions/Miscarriage	How many? EGA?
OH3.	Therapeutic Abortions	How many? EGA?
OH4.	Fetal Demise	How many? EGA?
OH5.	Live Births	

Please exclude information regarding recent pregnancy for this second table.

Number		Notes
OH6.	Premature Births (less than 37 weeks)	
OH7.	Infant birth weight less than 5 pounds 8 ounces	
OH8.	Pregnancies with preeclampsia, toxemia, or pregnancy related high blood pressure	
OH9.	Pregnancies with birth defects or genetic diagnoses	How many?
OH10.	Pregnancies with pregnancy related diabetes	
OH11.	C-Sections	
OH12.	Number of children who died	How many? Reason?
OH13.	Children living in the custody of another person	How many? Who are they with?

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You enrolled in this program because your baby weighed less than 5 ½ pounds, has a congenital anomaly, or died. I'd like to ask you some questions about your recent pregnancy.

OH14.   Think back to just before you were pregnant. How did you feel about becoming pregnant?
☐ 1. I wanted to be pregnant sooner
☐ 2. I wanted to be pregnant then
☐ 3. I wanted to be pregnant later
☐ 4. I didn't want to be pregnant then or at any time in the future

How much pressure did you feel from your (husband/boyfriend/baby's father) to become pregnant?

Did your doctor tell you why he thought…
A) you had a baby that is low birth weight or has congenital anomalies?
B) your baby died?

Do you think you had any health problems during your pregnancy that may have affected the baby?

Do you have any thoughts about what caused…
A) your baby to be low birth weight or have a congenital anomaly?
B) your baby to die?

Did you go into labor early (<37 weeks)?

Did the doctor tell you what might have caused you to go into labor early?

IF FETAL DEMISE SKIP NEXT QUESTION

Do you have any concerns about your baby?

Altogether how may children do you <u>plan</u> to have?

How long do you plan to wait until you get pregnant again?

Do you have any concerns about your future pregnancy?

OH26.   In the year prior to your recent pregnancy, how often did you or any partner usually use any method of birth control/family planning?
☐ 1. Never…**(OH35)**   ☐ 4. Most of the time,
☐ 2. Once in a while   ☐ 5. Always until you stopped
☐ 3. About ½ of the time   ☐ 6. Every time (pregnancy is a method failure)

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OH27. **In the year prior to your recent pregnancy, how often did you or any partner usually use condoms during intercourse?**
- ☐ 1. Never **(Skip OH28)**
- ☐ 2. Once in a while **(Skip OH28)**
- ☐ 3. About ½ of the time **(Skip OH28)**
- ☐ 4. Most of the time **(Skip OH28)**
- ☐ 5. Always until you stopped
- ☐ 6. Every time (pregnancy is a method failure)

OH28. **During this period before your recent pregnancy, how long had you been using condoms all the time?**
- ☐ 1. Less than 30 days ☐ 2. 30 days to 6 months ☐ 3. 6 months or more

What kind of birth control/family planning did you or any partner use most often?

Have you had any problems with any method of birth control/family planning you may have tried?

What type of birth control/family planning where you advised not to use?

And for what reason:

OH35. **What is your current plan for birth control/family planning? (pick all that apply)**

YES		NO	
☐	A	☐	BIRTH CONTROL PILLS
☐	B	☐	CONDOM OR RUBBER
☐	C	☐	CREAM OR JELLY
☐	D	☐	DIAPHRAGM
☐	E	☐	DOUCHING AFTER INTERCOURSE
☐	F	☐	FOAM
☐	G	☐	IUD, COIL, OR LOOP
☐	H	☐	RHYTHM (SAFE PERIOD BY CALENDAR)
☐	I	☐	SAFE PERIOD BY TEMPERATURE
☐	J	☐	SUPPOSITORY
☐	K	☐	TODAY SPONGE
☐	L	☐	VASECTOMY OR MALE STERILIZATION
☐	M	☐	WITHDRAWAL OR PULLING OUT
☐	N	☐	NORPLANT
☐	O	☐	DEPOPROVERA
☐	P	☐	MORNING AFTER PILL
☐	Q	☐	TUBAL LIGATION
☐	R	☐	OTHER (SPECIFY):

OH36. **In the next 6 months, how likely are you to consistently use a method of birth control?**
- ☐ 1. Not at all ☐ 2. Not very ☐ 3. Somewhat ☐ 4. Very

OH37. **In the next month, how likely are you to consistently use a method of birth control?**
- ☐ 1. Not at all ☐ 2. Not very ☐ 3. Somewhat ☐ 4. Very

How much would your partner <u>interfere</u> with or discourage you from using a method of birth control/family planning if you decided that you wanted to use it?

7

Tell me how much you agree with the following statements.

OH42. Using a condom helps to prevent the spread of sexually transmitted diseases.
    ☐1. Strongly agree   ☐2. Agree   ☐3. Disagree   ☐4. Strongly disagree

OH43. How much would your partner <u>resist</u> using a condom?
    ☐1. None   ☐2. Very little   ☐3. Some   ☐4. A great deal   ☐5. Not Applicable

Answer for when this child was conceived

OH44. Are you and your partner in a mutually monogamous relationship, that is, do you both have sex only with each other?
    ☐1. Yes   ☐2. No   ☐3. Not Sure

Since you've been sexually active, how many different sexual partners have you had?

OH46. To your knowledge, have you ever had a sexually transmitted disease?
    ☐1. Yes   ☐2. No   ☐3. Not Sure

In the next 6 months (or within six months after you begin having sex again), when you have intercourse, how often do you expect to use condoms?

OH48. Regarding your 6 week postpartum check-up:
    ☐1. I have an appointment scheduled
    ☐2. I do not have an appointment scheduled
    ☐3. I kept the appointment that I scheduled
    ☐4. I missed the appointment that I scheduled
        When
        Where

SECTION HH. HEALTH HABITS

Now I have some questions about how you feel about your health in general.

Are you currently being treated for a health problem such as Diabetes, HTN, Cancer, HIV, Hepatitis?

Has anyone ever told you that you have a health problem?

How would you rate your overall health?

HH5. How much did you weigh just before you became pregnant?   pounds

HH6. How tall are you?   feet   inches

Please answer the following questions about your diet during your pregnancy and now:

How many meals do you usually eat each day now?

Has a doctor ever told you that you were overweight?

Has anyone ever said to you that you're too thin, that you should gain weight?

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Have you ever made yourself throw up after eating?

HH17. Did you receive any of the following while you were pregnant?
Yes   No
☐ A ☐ WIC
☐ B ☐ Food Stamps
☐ C ☐ Food from Emergency Food Banks
☐ D ☐ Commodity supplemental foods
☐ E ☐ Colorado SHARE

HH18. Do you receive any of the following now?
Yes   No
☐ A ☐ WIC
☐ B ☐ Food Stamps
☐ C ☐ Food from Emergency Food Banks
☐ D ☐ Commodity supplemental foods
☐ E ☐ Colorado SHARE

HH19. In the last year, have there been times that you did not have enough to eat or you ran of food?
☐ 1. Yes   ☐ 2. No

HH20. Did you take prenatal vitamins during your pregnancy?
☐ 1. Yes   ☐ 2. No

HH21. Are you taking vitamins, minerals, or other supplements now?
☐ 1. Yes   ☐ 2. No

HH22. Did you take iron supplements during you pregnancy?
☐ 1. Yes   ☐ 2. No

HH23. Are you taking iron supplements now?
☐ 1. Yes   ☐ 2. No

HH24. Are you currently breast feeding or feeding your baby your breast milk in a bottle?
☐ 1. Yes   ☐ 2. No   ☐ 3. Not Applicable

Are you currently taking any medication other than the vitamins and iron I just asked about, either over-the-counter or prescribed?

Have you ever…
a) worked with or been exposed to lead or other chemicals?
b) had any radiation exposure?
c) have any xray exposure to your pelvis during your pregnancy?

HH28. Prior to your becoming pregnant, how often did you exercise, such as walking 20 minutes without stopping?
☐ 1. Daily   ☐ 5. Monthly
☐ 2. 2-3x per week   ☐ 6. Rarely
☐ 3. Weekly   ☐ 7. Never
☐ 4. 2-3x per month

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These next questions ask you about how often and how comfortable you are when you contact your health care provider and the health care system.

HH29.	Where do you receive your health care most of the time?

☐1. DGH clinic   ☐8. Montbello
☐2. Eastside   ☐9. Park Hill
☐3. Globeville   ☐10. Quigg Newton
☐4. Hyde Park   ☐11. Westside
☐5. La Casa   ☐12. Westwood
☐6. Lowry   ☐13. Other
☐7. Mariposa

HH30. When you are not feeling well, how often do you talk to a nurse or doctor at the clinic to get advice on how to feel better?
☐1. Never   ☐2. Rarely   ☐3. Usually   ☐4. Almost Always   ☐5. Always

HH31. When you contact the nurse or doctor for a medical condition, what type of problems have you experienced when seeking care or advise?

Yes   No
☐ A ☐ No Problems encountered
☐ B ☐ Telephones Busy
☐ C ☐ No one called you back
☐ D ☐ Couldn't get an appointment as soon as you wanted one
☐ E ☐ Waited too long to be seen
☐ F ☐ Was given the wrong advice
☐ G ☐ Didn't understand the advice or instructions
☐ H ☐ Care was too expensive
☐ I ☐ Language barrier
☐ J ☐ Transportation difficulties
☐ K ☐ Other

I see my doctor every year for a pap and pelvic examination, and not just when I'm sick.

What areas of your health do you have concerns or question about?

Smoke/Smoking

Now, I have some questions about second-hand smoke and how much you are exposed to it.

HH36. Do you currently spend at least seven hours each week with anyone who smokes cigarettes, cigars, or pipes while you're there? This includes parents, grandparents other family members, friends, neighbors, or even people you may work with?
☐ 1. Yes   ☐ 2. No

Now I have some questions about smoking cigarettes. Many people smoke at least some time in their like. Sometimes women who are pregnant will smoke cigarettes before they know they are pregnant, or they may find it very hard to change a pattern of smoking once they start. These are questions about regular, nicotine cigarettes only. Marijuana, also called pot or weed, will be asked later.

HH37. Have you smoked cigarettes in the last two years?
☐1. Yes   ☐2. No....**(HH45)**
How long ago did you quit smoking?

HH38. Did you smoke cigarettes at all during your pregnancy, including before you found out you were pregnant?   ☐1. Yes   ☐2. No....**(HH45)**

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HH39.	Did you quit or cut down on your smoking when you found out you were pregnant?
	☐1. Yes ☐2. No

HH40.	During your pregnancy, when you smoked, how many cigarettes did you USUALLY smoke per day?

HH41.	In the last 48 hours, HOW MANY cigarettes have you smoked?

HH42.	Have you seriously considered quitting smoking in the next 6 months.
	☐1. Yes ☐2. No

HH43.	Are you planning to quit within the next 30 day?
	☐1. Yes ☐2. No

HH44.	In the past year have you quit smoking for 24 hours or more?
	☐1. Yes ☐2. No

Alcohol/Drinking

Now I am going to ask you some questions about alcohol. Many people drink alcohol at least some time in their life. Sometimes women who are pregnant will drink before they know they are pregnant, or they may find it very hard to change a pattern of drinking once they start. By alcohol, I mean beer, wine, wine coolers, and liquor, such as whiskey, scotch, gin, rum, or other types of drinks with alcohol in them.

HH45.	Have you had any drink with alcohol in it in the last two years?
	☐1. Yes ☐2. No…..(HH57)

HH46.	DURING this pregnancy, how often did you drink alcohol?
	☐1. Never ☐4. Monthly
	☐2. Once or Twice ☐5. Weekly
	☐3. 3 to 8 times ☐6. Daily

HH47.	OVER THE PAST FOURTEEN DAYS, on how many DIFFERENT DAYS did you use alcohol?

HH48.	OVER THE PAST FOURTEEN DAYS, when you drank alcohol, how many drinks did you USUALLY have PER DAY?

HH49.	Have you ever felt you ought to cut down on your drinking?
	☐1. Yes ☐2. No

HH50.	Have people annoyed you by criticizing you drinking?
	☐1. Yes ☐2. No

HH51.	Have you ever felt bad or guilty about your drinking?
	☐1. Yes ☐2. No

HH52.	Have you ever had a drink first thing in the morning to steady your nerves or get rid of a hangover (an eyeopener)?
	☐1. Yes ☐2. No

HH53.	Have you seriously considered quitting drinking alcohol in the next 6 months?
	☐1. Yes ☐2. No

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HH54.	Are you planning to quit in the next 30 days?
	☐1. Yes ☐2. No

HH55.	Have you enrolled in any alcohol treatment program in the past 3 months?
	☐1. Yes ☐2. No

HH56.	Are you currently enrolled in any program?
	☐1. Yes ☐2. No

Marijuana

Now I'm going to ask you a series of questions about many other types of drugs. Sometimes women who are pregnant will use drugs before they know they are pregnant, or they may find it very hard to change a pattern of drug use once they start.
These next questions are about marijuana, also called pot or weed.

HH57.	Have you ever used marijuana? ☐1. Yes ☐2. No…..(HH61)

HH58.	DURING this pregnancy, how often did you use marijuana?
	☐1. Never ☐4. Monthly
	☐2. Once ☐5. Weekly
	☐3. Twice ☐6. Daily

HH59.	OVER THE PAST FOURTEEN DAYS, on how many DIFFERENT DAYS did you use marijuana?

HH60.	OVER THE PAST FOURTEEN DAYS, when you used marijuana, how many pipes or joints did you usually smoke PER DAY?

Cocaine

Now I'm going to ask some questions about cocaine. This can be either powder cocaine that you sniff OR crack cocaine that you smoke.

HH61.	Have you ever used cocaine?
	☐1. Yes ☐2. No…..(HH65)

HH62.	DURING this pregnancy, how often did you use cocaine?
	☐1. Never ☐4. Monthly
	☐2. Once ☐5. Weekly
	☐3. Twice ☐6. Daily

HH63.	OVER THE PAST FOURTEEN DAYS, on how many DIFFERENT DAYS did you use cocaine?

HH64.	OVER THE PAST FOURTEEN DAYS, when you used cocaine, how many times PER DAY did you USUALLY use it?

Inhalants

Now I'm going to ask you some questions about INHALANTS. Inhalants are things that people sniff or huff in order to get high, such as spray paint, hairspray, gasoline, lighter fluid, glue, or paint thinner.

HH65.	Have you ever sniffed inhalants such as the ones I just mentioned?
	☐1. Yes ☐2. No…..(HH69)

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HH66. DURING this pregnancy, how often did you use inhalants?
- ☐ 1. Never
- ☐ 2. Once
- ☐ 3. Twice
- ☐ 4. Monthly
- ☐ 5. Weekly
- ☐ 6. Daily

HH67. OVER THE PAST FOURTEEN DAYS, on how many DIFFERENT DAYS did you use inhalants?

HH68. OVER THE PAST FOURTEEN DAYS, when you used inhalants, how many times PER DAY did you USUALLY use them?

Street Drugs
Now I'm going to ask you a few questions about other drugs that people use to get high. These include AMPHETAMINES, such as speed, uppers, reds, crystal, or ice: LSD, such as acid, blotter, or trips: other HALLUCINOGENS, such as peyote, ecstasy, mescal, or magic mushrooms; PCP; AMYL NITRATE; or HERION, also known as smack, junk, speedball, or horse.

HH69. Have you ever used any of the drugs I just mentioned?
- ☐ 1. Yes
- ☐ 2. No…..(HH73)

HH70. DURING this pregnancy, how often did you use these other street drugs?
- ☐ 1. Never
- ☐ 2. Once
- ☐ 3. Twice
- ☐ 4. Monthly
- ☐ 5. Weekly
- ☐ 6. Daily

HH71. Over the past FOURTEEN DAYS, on how many DIFFERENT DAYS did you use these other street drugs?

Questions HH73-HH76 refer to Marijuana, Cocaine, Inhalants and Street Drugs

HH73. Have you seriously considered quitting using drugs in the next 6 months?
- ☐ 1 Yes
- ☐ 2. No…..(HH77)

HH74. Are you planning to quit (using drugs) in the next 30 days?
- ☐ 1. Yes
- ☐ 2. No

HH75. Have you enrolled in any substance abuse treatment program in the past 3 months?
- ☐ 1. Yes
- ☐ 2. No

HH76. Are you currently enrolled in any substance abuse treatment program?
- ☐ 1. Yes
- ☐ 2. No

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Domestic Violence

Lots of women have been hit or hurt by someone in their life. Even though it can be hard to think about this, it is very important for studies like this one that are trying to help women and their babies to get this kind of information.

HH77. Have you ever been hit, grabbed, slapped, kicked, choked, or hurt by anyone?
☐1. Yes   ☐2. No…..(HH78)

HH77a. Was this done by your partner?   ☐1. Yes   ☐2. No…(HH77c)

HH77b. How often did your partner do this?	Was this done by someone else?
☐1. Once	Past partner ☐yes ☐no
☐2. 2 to 5 times	parent ☐yes ☐no
☐3. 6 to 10 times	friend ☐yes ☐no
☐4. More than 10 times	stranger ☐yes ☐no
	other ☐yes ☐no

HH77c. Has this happened in the last month? ☐1. Yes   ☐2. No

HH78. Has anyone verbally threatened you in anyway?
☐1. Yes   ☐2. No…..(HH79)

HH78a. Was this done by your partner?   ☐1. Yes   ☐2. No…(HH78c)

HH78b. How often did your partner do this?	Was this done by someone else?
☐1. Once	Past partner ☐yes ☐no
☐2. 2 to 5 times	parent ☐yes ☐no
☐3. 6 to 10 times	friend ☐yes ☐no
☐4. More than 10 times	stranger ☐yes ☐no
	other ☐yes ☐no

HH78c. Has this happened in the last month? ☐1. Yes   ☐2. No

HH79. Has anyone ever forced you into sexual activity?
☐1. Yes   ☐2. No…..(HH80)

HH79a. Was this done by your partner?   ☐1. Yes   ☐2. No…(HH79c)

HH79b. How often did your partner do this?	Was this done by someone else?
☐1. Once	Past partner ☐yes ☐no
☐2. 2 to 5 times	parent ☐yes ☐no
☐3. 6 to 10 times	friend ☐yes ☐no
☐4. More than 10 times	stranger ☐yes ☐no
	other ☐yes ☐no

HH79c. Has this happened in the last month? ☐1. Yes   ☐2. No

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HH80. Did anyone use, or threaten to use, a knife on you or fire a gun at you?
☐1. Yes   ☐2. No…..(HH81)

HH80a. Was this done by your partner?   ☐1. Yes   ☐2. No…(HH80c)

HH80b. How often did your partner do this?   **Was this done by someone else?**
☐1. Once   Past partner   ☐yes ☐no
☐2. 2 to 5 times   parent   ☐yes ☐no
☐3. 6 to 10 times   friend   ☐yes ☐no
☐4. More than 10 times   stranger   ☐yes ☐no
          other   ☐yes ☐no

HH80c. Has this happened in the last month? ☐1. Yes   ☐2. No

HH81. Has anyone, ever denied you money or made you feel like you are a prisoner in your own home?
☐1. Yes   ☐2. No…..(HH82)

HH81a. Was this done by your partner?   ☐1. Yes   ☐2. No…(HH81c)

HH81b. How often did your partner do this?   **Was this done by someone else?**
☐1. Once   Past partner   ☐yes ☐no
☐2. 2 to 5 times   parent   ☐yes ☐no
☐3. 6 to 10 times   friend   ☐yes ☐no
☐4. More than 10 times   stranger   ☐yes ☐no
          other   ☐yes ☐no

HH81c. Has this happened in the last month? ☐1. Yes   ☐2. No

If you answered NO to #77 to #82--------Skip to #88.

HH82. How many times, during your last pregnancy, did your partner do any of the things you were just asked about?

HH83. How many times, during your last pregnancy, did anyone else do any of the thigs you were just asked about?

HH84. Have you ever left this, or any other, abusive relationship?
☐1. Yes   ☐2. No

HH85. In the next 6 months, how likely are you to leave the current abusive situation?
☐1. Not at all   ☐2. Not very   ☐3. Somewhat   ☐4. Very

HH86. In the next 6 months, how likely are you to leave the current abusive situation?
☐1. Not at all   ☐2. Not very   ☐3. Somewhat   ☐4. Very

HH87. Do you have a plan?   ☐1. Yes   ☐2. No

HH88. Have you been in the legal system, such as juvenile court, probation, jail, or on parole during the last two years?
☐1. Yes   ☐2. No
If yes, when
Reason

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HH89. **Have you thought about hurting yourself or committing suicide?**
☐1. Yes ☐2. No….**(HH92)**
If yes, when

What did you think about doing?

What happened or what did you do to get through those feelings?

HH92. **Have you participated in counseling sessions, either group or individual, in the last two years?**
☐1. Yes ☐2. No

HH93. **Are you concerned that anyone could physically or verbally harm you child/children?**
☐1. Yes ☐2. No
If yes, who? partner yes no
past partner yes no
parent yes no
friend yes no
stranger yes no
other yes no

Do you have any other safety concerns for your self or you family?

SECTION PA. POSITIVE AFFECT

These next questions are about how you feel, and how things have been with <u>you during the past thirty days.</u>

	All of the Time	Most of the Time	Some of the Time	Almost Never	Never
PA1. How much of the time have you been a very nervous person?	☐1	☐2	☐3	☐4	☐5
PA2. During the past thirty days, how much of the time have you felt calm and peaceful?	☐1	☐2	☐3	☐4	☐5
PA3. How much of the time have you felt downhearted and blue?	☐1	☐2	☐3	☐4	☐5
PA4. How often have you felt so down in the dumps that nothing could cheer you up?	☐1	☐2	☐3	☐4	☐5
PA5. During the last thirty days, how much of the time were you a happy person?	☐1	☐2	☐3	☐4	☐5

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SECTION PB.　　　PERSONAL BELIEFS

Now I would like to ask for your opinion about some things. Please listen to each of the following statements and tell me how strongly you agree or disagree with each one. Be as accurate and honest as you can and try not to let your answer to one statement influence your answer to another. There are no right or wrong answers.

		Strongly Agree	Agree	Disagree	Strongly Disagree
PB1.	I have little control over the things that happen to me	☐1	☐2	☐3	☐4
PB2.	There is really no way I can solve some of the problems I have	☐1	☐2	☐3	☐4
PB3.	There is little I can do to change many of the important things in my life	☐1	☐2	☐3	☐4
PB4.	I often feel helpless in dealing with the problems of life	☐1	☐2	☐3	☐4
PB5.	Sometimes I feel that I'm being pushed around in life	☐1	☐2	☐3	☐4
PB6.	What happens to me in the future mostly depends on me	☐1	☐2	☐3	☐4
PB7.	I can do just about anything I really set my mind to do	☐1	☐2	☐3	☐4

SECTION SS.　　　SOCIAL AND COMMUNITY SUPPORT

Now, I am going to ask you some questions about people that you can count on to help and support you.

Are your natural parents still alive?

Were you raised by at least one of your natural parents?

What ages were you when you were taken care of by (person in SS2)?

Have you had any contact with your (mother/maternal figure) in the past year?

Have you had any contact with you (father/paternal figure) in the past year?

SS6.　　Is there anybody else, not including your husband/partner, that you feel you can count on to help you? (Include family and friends.)
　　　☐ 1. Yes　　　　☐ 2. No

How many people do you feel you can count on to help you with child care, transportation, or an emergency situation?

What is their relationship to you?

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Now, I would like to ask you some questions about community services you and/or your family is involved with.

SS9.	Within the last year, have you received assistance from any of the following resources or programs?

A)	Ancillary Health Care (exclude regular medical care and medical care regarding recent pregnancy)	☐ 1. Yes	☐ 2. No

☐ Medical Care
☐ Vision Care
☐ Dental Care
☐ Visiting Nurse Services
☐ Health Care Information
☐ Other

B)	Mental Health Services	☐ 1. Yes	☐ 2. No

C)	Substance Abuse Services	☐ 1. Yes	☐ 2. No

☐ Alcohol Treatment Services
☐ Drug Treatment Services
☐ AA
☐ Other program

D)	Smoking Cessation Program	☐ 1. Yes	☐ 2. No

E)	Adult Education and Enrichment Services	☐ 1. Yes	☐ 2. No

☐ GED, High School, College studies
☐ Job Training
☐ Young Mother/Teen Educ. Programs
☐ Parenting Education and Information
☐ Other

F)	Child Education	☐ 1. Yes	☐ 2. No

☐ Early Childhood Education or Therapy Programs
☐ Head Start
☐ Child Development Information
☐ Other

G)	Family Services	☐ 1. Yes	☐ 2. No

☐ Family Crisis Center
☐ Safehouse
☐ Domestic Violence Counseling Services
☐ Other

H)	Housing	☐ 1. Yes	☐ 2. No

☐ HUD
☐ Section 8
☐ Residential Living (i.e. Decatur Place, Warren Village)
☐ Homeless Coalition
☐ Other

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I)	Life Necessities	☐ 1. Yes	☐ 2. No

☐ Telephone
☐ Utilities-gas, electricity
☐ Transportation
☐ Clothing
☐ Emergency Services (food, shelter, utilities)

J)	Miscellaneous Services	☐ 1. Yes	☐ 2. No

☐ Church/Religious Groups
☐ Legal Services
☐ Other

K)	Special Programs within DH&H	☐ 1. Yes	☐ 2. No

☐ EPSDT
☐ DAYS
☐ DHCF Program
☐ Special Connections
☐ Prenatal Plus Program
☐ Other

What programs have you volunteered your services to?

Is transportation a problem for you?

Who is available to help you with your transportation needs?

These are all the questions I have to ask you right now. Is there any other information you would like to share with me or any concerns you have at this time?

Thank you for you help in answering these questions.

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IHPI
Encounter Form[11/97]
Direct Care Visit

Case Manager_____

Client ID#:	Date:	//

Total Time: ____ : ____

Encounter was: [1] Planned   [2] Crisis

Client's engagement in visit: rate 1(low) to3(high)   (1)   (2)   (3)

☐   Involvement . . . .

☐   Problem-solving. . . . .

☐   Understanding of material . . . .

☐   Environmental distractions . . ..

☐   Client's preoccupation with. . . . .
              other events/crises.

Proportion of visit activities:

	AREA	TIME SPENT
☐	Personal Health	%
☐	Family Planning	%
☐	Life Necessities	%
☐	Life Course	%
☐	Relationship Issues	%
☐	Maternal Role	%
☐	Life Style Behaviors	%
☐	Use of Services	%
☐	Services Related to Client's Family Members	%
	Significant Other	----------------
		100%

REFERRAL SOURCES

[1] Public Agencies DSS,SSI,SSDI   [7] Health Care   [12] Adult Edu
[2] Emergency Services   [8] STS Services   [13] Child Edu/Devel Services
[3] Nutrition/Food   [9] Mental Health Ser   [14] Child Care/Day Care
[4] Life Necessities   [10] Family Services   [15] Legal Services
[5] Financial Mngmt   [11] Financial Resources [16] Other

(6) Recommendations to client:_____

PT/FAMILY BARRIERS	**COMM RESOURCE BARRIERS**	**DHH BARRIERS**
Pt/Fam Conflict	(1) Resource/Svcs Lacking	(1) Delay Getting Appt
(2) Pt/Fam Decision Mkng	(2) Resource/Svcs Delay	(2) System Delay
Problem Solving	(3) Pt Ineligible	(3) Uncoordinated Care
(3) Pt/Fam Uncoop	(4) Approval Delay	(4) Staff Communication
(4) Med Complication	(5) Agency/Staff Communication	(5) Language Barrier
(5) Unstable Condition	(6) Language Barrier	(6) Distrust of Care Prov
(6) Pt/Fam Cog Impair	(7) Other Comm Barrier	(7) Other DHH Barrier
Other Pt/Fam Factor		

Tabled Data

The tables in this section provide more complete results than what was provided in the main sections of this report. Each of these tables is referenced in the main body of the report.

Table A is a summary of the status of all the IHPI cases. The two left-hand columns represent cases as of January, 2002. The two right-hand columns are cases as of 7/1/1999. This latter group is significant since it is the group with the most complete follow-up data. The numbers in the two columns differ for two reasons. Not only were additional new cases recruited into the program after 7/1/1999, there was movement of cases from one category to another after 7/1/1999.

Table A

PROJECT VS STUDY POPULATION SUMMARIES DECEMBER 1995 - JANUARY 2002

	PROJECT PERIOD 12/1995-1/2002		STUDY PERIOD 12/1995-7/1999	
TOTAL	559 (100%)		503 (100%)	
DECLINED	238 (42.6%)		223 (44.3%)	
COMPARISON	25 (4.5%)		25 (5.0%)	
PARTICIPATED	296 (53.0%)	296 (100%)	255 (50.7%)	255 (100%)
TUBAL ONLY	11 (2.0%)	11 (3.7%)	11 (2.2%)	11 (4.3%)
INTAKE	69 (12.3%)	69 (23.3%)	82 (16.3%)	82 (32.2%)
SIX MONTH	77 (13.8%)	77 (26.0%)	71 (14.1%)	71 (27.8%)
EXIT	139 (24.9%)	139 (47.0%)	91 (18.1%)	91 (35.7%)

Table B lists the 1996 births from Denver Health that were made available to IHPI . It shows the proportions of these births that fall into the categories of congenital anomalies, neonatal death and low birthweight.

Table C is a modified version of Table B. It displays the numbers and proportions of births for 1996 after the non-qualifying births are dropped out. Although these figures will vary from year to year, it is expected that these figures are a fair approximation of the number of qualifying cases for all of the years of the IHPI operation.

Table B

APPROXIMATE DHHA BIRTHS IN 1996 AND PROGRAM QUALIFIERS

| | | | | CONGENITAL ANOMALIES | | | | TOTAL | |
| | | | | YES | | NO | | | |
				#	%	#	%	#	%
LOW BIRTH WEIGHT	NO	NEONATAL DEATH	NO	110	4.2%	2254	86.0%	2364	90.2%
			YES			1	.0%	1	.0%
	YES	NEONATAL DEATH	NO	31	1.2%	220	8.4%	251	9.6%
			YES	2	.1%	3	.1%	5	.2%
TOTAL				143	5.5%	2478	94.5%	2621	100.0%

Table C

ESTIMATED PROPORTIONS OF PROGRAM QUALIFIERS

| | | | | CONGENITAL ANOMALIES | | | | TOTAL | |
| | | | | YES | | NO | | | |
				#	%	#	%	#	%
LOW BIRTH WEIGHT	NO	NEONATAL DEATH	NO	110	30.0%			110	30.0%
			YES			1	.3%	1	.3%
	YES	NEONATAL DEATH	NO	31	8.4%	220	59.9%	251	68.4%
			YES	2	.5%	3	.8%	5	1.4%
TOTAL				143	39.0%	224	61.0%	367	100.0%

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Table D shows the number and proportion of low birthweight cases that qualified for the IHPI program, but were ineligible to participate. The complete eligibility/ineligibility criterion are available on page 126.

Table D

REASONS FOR LBW PROGRAM INELIGIBILITY

	COUNT	PERCENT
TUBAL LIGATION	86	42.8%
INCARCERATED	3	1.5%
TWINS	59	29.4%
NO ENGLISH/SPANISH	8	4.0%
OTHER	32	15.9%
OTHER PROGRAM	13	6.5%
TOTAL	201	100.0%

Table E is a month by month breakdown of the number of low birthweight deliveries at Denver Health as well as the number of women who were eligible, the number that were contacted by the IHPI staff and the number that were finally enrolled into the program. In most of 1995, there were no contacted women until the program began late in the year.

Table E

PROGRAM LBW PENETRATION BY YEAR
1/1995 through 6/1998

		PROGRAM PENETRATION						
		LBW birth COUNT	eligible		contacted		enrolled	
			COUNT	PERCENT	COUNT	PERCENT	COUNT	PERCENT
1995.00	JAN	23.00	21.00	91.30	.00	.00	.00	.00
	FEB	19.00	13.00	68.42	.00	.00	.00	.00
	MAR	22.00	15.00	68.18	.00	.00	.00	.00
	APR	22.00	17.00	77.27	.00	.00	.00	.00
	MAY	16.00	9.00	56.25	.00	.00	.00	.00
	JUN	15.00	7.00	46.67	.00	.00	.00	.00
	JUL	14.00	10.00	71.43	.00	.00	.00	.00
	AUG	18.00	12.00	66.67	.00	.00	.00	.00
	SEP	23.00	15.00	65.22	.00	.00	.00	.00
	OCT	29.00	18.00	62.07	1.00	3.45	1.00	3.45
	NOV	19.00	17.00	89.47	1.00	5.26	1.00	5.26
	DEC	26.00	25.00	96.15	11.00	42.31	7.00	26.92
1996.00	JAN	19.00	15.00	78.95	12.00	63.16	6.00	31.58
	FEB	15.00	13.00	86.67	13.00	86.67	6.00	40.00
	MAR	19.00	16.00	84.21	7.00	36.84	1.00	5.26
	APR	23.00	20.00	86.96	20.00	86.96	4.00	17.39
	MAY	15.00	14.00	93.33	14.00	93.33	7.00	46.67
	JUN	19.00	16.00	84.21	16.00	84.21	3.00	15.79
	JUL	25.00	17.00	68.00	3.00	12.00	.00	.00
	AUG	20.00	17.00	85.00	8.00	40.00	1.00	5.00
	SEP	19.00	18.00	94.74	10.00	52.63	5.00	26.32
	OCT	18.00	15.00	83.33	10.00	55.56	3.00	16.67
	NOV	21.00	16.00	76.19	9.00	42.86	2.00	9.52
	DEC	22.00	20.00	90.91	6.00	27.27	3.00	13.64
1997.00	JAN	22.00	17.00	77.27	8.00	36.36	3.00	13.64
	FEB	15.00	13.00	86.67	9.00	60.00	4.00	26.67
	MAR	16.00	11.00	68.75	5.00	31.25	3.00	18.75
	APR	16.00	12.00	75.00	9.00	56.25	7.00	43.75
	MAY	21.00	13.00	61.90	9.00	42.86	8.00	38.10
	JUN	25.00	21.00	84.00	14.00	56.00	7.00	28.00
	JUL	13.00	12.00	92.31	4.00	30.77	3.00	23.08
	AUG	26.00	18.00	69.23	12.00	46.15	5.00	19.23
	SEP	28.00	22.00	78.57	15.00	53.57	9.00	32.14
	OCT	25.00	18.00	72.00	11.00	44.00	7.00	28.00
	NOV	28.00	16.00	57.14	14.00	50.00	4.00	14.29
	DEC	24.00	15.00	62.50	10.00	41.67	4.00	16.67
1998.00	JAN	24.00	14.00	58.33	3.00	12.50	3.00	12.50
	FEB	17.00	9.00	52.94	5.00	29.41	5.00	29.41
	MAR	13.00	11.00	84.62	1.00	7.69	1.00	7.69
	APR	14.00	9.00	64.29	4.00	28.57	4.00	28.57
	MAY	16.00	14.00	87.50	3.00	18.75	3.00	18.75
	JUN	25.00	21.00	84.00	14.00	56.00	7.00	28.00
TOTAL		849.00	642.00	75.62	291.00	34.28	137.00	16.14

Table F is a summary table of program penetration based on Table E.

Table F

PROGRAM PENETRATION BY YEAR
1/1996 through 6/1998

	PROGRAM PENETRATION							
	LBW birth COUNT	eligible		contacted		enrolled		
		COUNT	% OF LBW	COUNT	% OF LBW	COUNT	% OF LBW	
1996.00	235	197	83.8%	128	54.5%	41	17.4%	
1997.00	259	188	72.6%	120	46.3%	64	24.7%	
1998.00	109	78	71.6%	30	27.5%	23	21.1%	
TOTAL	603	463	76.8%	278	46.1%	128	21.2%	

Tables G and H compare women who were contacted to those who were eligible but not contacted. The variables in red indicate a significant difference at the .05 level while yellow indicates a .10 level of significance.

Table G

CONTACTED VERSUS NON-CONTACTED ELIGIBLE CASES						
		PROGRAM STATUS				
		IHPI ELIGIBLE CONTACTED		IHPI ELIGIBLE NOT CONTACTED		
		COUNT	PERCENT	COUNT	PERCENT	p
MARITAL STATUS	NOT MARRIED	219	78.8%	121	65.4%	.001
	MARRIED	59	21.2%	64	34.6%	
BORN IN THE USA	NO	98	35.3%	100	54.1%	.000
	YES	180	64.7%	85	45.9%	
RACE	Amer Indian	6	2.2%	4	2.2%	.006
	Asian			4	2.2%	
	African American	44	15.8%	13	7.0%	
	Caucasian	222	79.9%	162	87.6%	
	Other	6	2.2%	2	1.1%	
HISPANIC	NO	94	33.8%	36	19.5%	.001
	YES	184	66.2%	149	80.5%	
High school graduate	Unknown	41	14.8%	16	8.6%	.179
	No	58	20.9%	37	20.0%	
	HS Grad	66	23.8%	55	29.7%	
	GED	9	3.2%	3	1.6%	
	SOME HIGH SCHOOL	103	37.2%	74	40.0%	
GENDER OF CHILD	Male	139	50.0%	89	48.1%	.690
	Female	139	50.0%	96	51.9%	
RECEIVED PRENATAL CARE	NO	35	12.6%	14	7.7%	.090
	YES	242	87.4%	169	92.3%	
Previous LBW infant	NO	215	80.5%	152	83.5%	.420
	YES	52	19.5%	30	16.5%	

p = <.10 (yellow); <.05 (red)

Table H

CONTACTED VERSUS NON-CONTACTED ELIGIBLE CASES

		PROGRAM STATUS		
		IHPI ELIGIBLE CONTACTED	IHPI ELIGIBLE NOT CONTACTED	p
AGE OF MOTHER	Mean	24.2	22.7	.008
	Std Deviation	6.27	5.08	
EGA AT BIRTH	Mean	34.4	36.2	.000
	Std Deviation	3.95	2.88	
BIRTH WEIGHT	Mean	1976.0	2208.9	.000
	Std Deviation	462.33	359.02	
EGA AT START OF PNC	Mean	16.0	16.5	.650
	Std Deviation	13.44	7.76	
NUMBER OF PNC VISITS	Mean	5.8	7.3	.000
	Std Deviation	4.15	3.99	

p = <.10 (yellow); <.05 (red)

Tables I and J compare women who participated in the program to those who were contacted but chose not to become involved (referred to as Decliners or Rejectors). The numbers displayed are the counts and the percentages within each group. For some variables the means and standard deviations are supplied instead. In these cases the numbers are listed inside brackets [ ] to distinguish them. The variables in red indicate a significant difference at the .05 level while yellow indicates a .10 level of significance.

Table I

COMPARISON OF IHPI REJECTORS VERSUS PARTICIPANTS
12/1995 - 9/1999

	Overall Total		Declined program		Participated		
	# [or mean]	% [or S.D.]	# [or mean]	% [or S.D.]	# [or mean]	% [or S.D.]	p value
number of women	423	100.0%	180	100.0%	243	100.0%	
mom under 19	95	22.5%	38	21.1%	57	23.5%	0.568
age	[23.5]	[6.1]	[24.1]	[6.5]	[22.9]	[5.6]	0.046
causacian	309	72.9%	129	71.7%	180	73.8%	0.630
hispanic	305	71.9%	120	66.7%	185	75.8%	0.038
english-speaking	292	69.2%	137	76.5%	155	63.8%	0.005
born in USA	264	62.4%	126	70.4%	138	56.6%	0.004
married	107	25.4%	39	21.9%	68	27.9%	0.165
previous LBW baby	74	28.2%	30	25.9%	44	30.1%	0.445
previous fetal demise	38	14.0%	9	7.3%	29	19.7%	0.003
positive genetic screen	108	25.5%	44	24.4%	64	26.2%	0.677
positive medical history	200	47.2%	85	47.2%	115	47.1%	0.985
current alcohol use	44	11.8%	28	18.7%	16	7.2%	0.001
current smoker	117	30.6%	55	35.5%	62	27.3%	0.089
current drug use	68	18.1%	40	26.0%	28	12.7%	0.001
current domestic violence	23	6.7%	10	7.2%	13	6.3%	0.756
psychological problems	66	15.9%	30	17.1%	36	15.1%	0.568
infection risk	109	30.3%	49	32.5%	60	28.7%	0.446
social problems	106	25.8%	45	25.9%	61	25.7%	0.977
mom under 105 lbs	21	6.1%	14	9.4%	7	3.6%	0.025
mom over 180 lbs	48	13.9%	27	18.1%	21	10.7%	0.013
weight change [lbs]	[+12.3]	[11.3]	[+12.6]	[12.5]	[+12.2]	[10.3]	0.746
face-to-face contact	283	67.1%	87	48.6%	196	80.7%	0.000
received prenatal care	372	87.9%	156	87.2%	216	88.5%	0.668
< 5 visits	180	44.6%	77	44.3%	103	44.8%	0.811
number of visits	[5.5]	[3.9]	[5.6]	[4.0]	[5.4]	[3.8]	0.598
male child	214	50.5%	84	46.7%	130	53.3%	0.178
gestational age at intake	[15.8]	[11.8]	[16.6]	[8.2]	[15.5]	[13.8]	0.383
gestational age at birth	[33.6]	[4.9]	[34.3]	[5.0]	[33.1]	[4.8]	0.014

Table J

COMPARISON OF IHPI REJECTORS VERSUS PARTICIPANTS
12/1995 - 9/1999

	Overall Total		Declined program		Participated		
	# [or mean]	% [or S.D.]	# [or mean]	% [or S.D.]	# [or mean]	% [or S.D.]	p value
positive for STD	385	90.8%	165	91.7%	220	90.2%	0.597
positve for other	262	61.8%	113	62.8%	149	61.1%	0.720
< 1500 grams	100	24.3%	32	18.3%	68	28.7%	0.015
birth weight in grams	[1902.4]	[661.8]	[2001.5]	[664.5]	[1829.2]	[651.5]	0.009
fetal death	42	9.9%m	20	11.1%	22	9.1%	0.484
admitted to ICU	192	51.2%	59	38.1%	133	60.5%	0.000
bleeding during pregnancy	67	15.8%	27	15.0%	40	16.4%	0.697
other medical problems during pregnancy	24	5.7%	9	5.0%	15	6.1%	0.613
renal problems during pregnancy	17	4.0%	4	2.2%	13	5.3%	0.107
preterm labor	200	47.2%	75	41.7%	125	51.2%	0.051
vaginal bleeding > 12 weeks	28	6.6%	12	6.7%	16	6.6%	0.964
anemia	55	13.0%	20	11.1%	35	14.3%	0.327
aprevia	42	9.9%	15	8.3%	27	11.1%	0.352
hypertension	65	15.3%	20	11.1%	45	18.4%	0.038
other OB complications	60	14.2%	20	11.1%	40	16.4%	0.123
GYN surgery	8	1.9%	5	2.8%	3	1.2%	0.247
intra-uterine growth retardation	75	17.7%	26	14.4%	49	20.1%	0.133
preterm rupture of membrane	72	17.0%	22	12.2%	50	20.5%	0.025
other OB problems in pregnancy	35	8.3%	13	7.2%	22	9.0%	0.507
abnormal utrasound	16	3.8%	5	2.8%	11	4.5%	0.355
C-section	90	21.4%	27	15.2%	63	25.9%	0.008
APGAR 1	[6.2]	[2.9]	[6.2]	[3.0]	[6.2]	[2.9]	0.969
APGAR 5	[7.2]	[2.9]	[7.1]	[3.2]	[7.3]	[2.8]	0.456
first pregnancy	150	35.4%	55	30.6%	95	38.9%	0.075
first full-term birth	226	54.7%	85	50.0%	141	58.0%	0.107
total length of hospital stay	[15.8]	[21.7]	[11.3]	[17.7]	[19.0]	[23.1]	0.001
early pnc with worse outcome	225	62.3%	80	51.6%	145	70.4%	0.000

Tables K and L display details on the number of participating women and their program status. Slightly less than one-quarter of the participants have only an intake form completed at this point. With time, many of these women will go on to complete additional surveys. One-third of the participants have reached the point of the six-month survey, and the remainder (43%) have completed a 12-month or exit interview. Women who complete a 6 month or 12-month survey are considered to be a project "Completer" for the purposes of this analysis.

Table L shows a breakdown of these 209 women by the number of months they have been in the program. It is clear that the women from the earlier years have more months of contact with the case managers. It is assumed that the later years will, in time, approximate the results from the earlier years.

Table K

| | | STATUS | | | | | | TOTAL | |
| | | INTAKE ONLY | | COMPLETED 6 MONTH | | COMPLETED EXIT | | | |
		Count	Count Percent	Count	Count Percent	Count	Count Percent	Count	Count Percent
YEAR OF INTAKE INTO IHPI PROGRAM	1995	2	100.0%					2	100.0%
	1996	5	8.8%	14	24.6%	38	66.7%	57	100.0%
	1997	15	23.1%	18	27.7%	32	49.2%	65	100.0%
	1998	26	43.3%	16	26.7%	18	30.0%	60	100.0%
	1999	1	4.0%	22	88.0%	2	8.0%	25	100.0%
TOTAL		49	23.4%	70	33.5%	90	43.1%	209	100.0%

PARTICIPANT BREAKDOWN BY YEAR

Table L

MONTHS IN THE PROGRAM BY YEAR

		YEAR OF INTAKE INTO IHPI PROGRAM					TOTAL
		1995	1996	1997	1998	1999	
		Count	Count	Count	Count	Count	Count
MONTHS IN THE PROGRAM	1		3	5	4		12
	2			6	7		13
	3		2	4	8		14
	4		1	2	3	1	7
	5		3		1		4
	6	1		1			2
	7	1	3	4	2	1	11
	8		2	1	2	3	8
	9		4	1	5	5	15
	10		4	2	2	3	11
	11		3	4	4	4	15
	12		2	4		1	7
	13		6	6	4	6	22
	14		1	5	5		11
	15		3	3	7	1	14
	16		2	4	1		7
	17		1	2	1		4
	18		1	3	3		7
	19		1				1
	20		2	1	1		4
	22		1	1			2
	23			3			3
	24		1	1			2
	25		1	1			2
	26		2				2
	27		4	1			5
	28		1				1
	30		2				2
	32		1				1
TOTAL		2	57	65	60	25	209

Tables M and N examine the differences between the women who declined to participate in the program and those who completed at least the six-month survey. Again, the variables in red indicate a significant difference at the .05 level while yellow indicates a .10 level of significance.

Table M

COMPLETERS VERSUS DECLINERS

	STATUS						
	DECLINED			SIX MONTH			
	Valid N	Mean	Std Deviation	Valid N	Mean	Std Deviation	p
DAYS FROM IHPI ENTRY TO LAST DENVER HEALTH CONTACT	108	526.65	420.70	157	597.54	412.54	.174
ESTIMATED INTERCONCEPTION INTERVAL	33	381.96	222.92	46	481.91	328.28	.134
Weight in Grams - Index Pregnancy	174	2042.31	678.98	156	1873.69	675.74	.025
Weight in Grams - Subsequent Pregnancy 1	21	2337.86	749.04	30	2837.50	612.04	.012
EGA - Index Pregnancy	180	34.29	4.98	162	32.96	5.47	.019
EGA - Subsequent Pregnancy 1	21	35.63	4.21	32	35.84	7.10	.904
# Inpatient Days - Index Pregnancy	157	7.68	12.99	149	16.19	24.56	.000
# Inpatient Days - Subsequent Pregnancy	180	.88	3.27	162	1.23	3.87	.356

Table N

COMPLETERS VERSUS DECLINERS

		STATUS				
		DECLINED		SIX MONTH		
		Count	Percent	Count	Percent	p
DID PATIENT MAKE A TWO WEEK POST-PARTUM VISIT?	NO	53	49.07	44	28.03	.000
	YES	55	50.93	113	71.97	
DID PATIENT MAKE OTHER FAMILY PLANNING VISIT WITHIN 7 MONTHS	NO	61	56.48	47	30.13	.000
	YES	47	43.52	109	69.87	
TYPE OF BIRTH CONTROL - DELV 1	NONE	38	35.19	19	12.10	.000
	PILL	26	24.07	50	31.85	
	NORPLANT/DEPO	35	32.41	72	45.86	
	IUD/TUBAL	3	2.78	10	6.37	
	OTHER	6	5.56	6	3.82	
SUBSEQUENT PREGNANCY	NO	144	80.00	114	70.37	.039
	YES	36	20.00	48	29.63	
Number of Subsequent Pregnancies	NONE	144	80.00	114	70.37	.081
	ONE	33	18.33	41	25.31	
	TWO	3	1.67	7	4.32	
OUTCOME OF SUBSEQUENT PREGNANCY	DELIVERED NORMAL WEIGHT	9	25.00	23	47.92	.091
	DELIVERED LOW WEIGHT	12	33.33	7	14.58	
	TAB/SAB/ETC.	6	16.67	9	18.75	
	UNKNOWN	9	25.00	9	18.75	
SUBSEQUENT LOW WEIGHT	NO	9	42.86	23	76.67	.014
	YES	12	57.14	7	23.33	
NICU Admission - Subsequent Preg 1	NO	15	68.18	28	100.00	.001
	YES	7	31.82	.00	.00	

Table O examines the number and percentages of women in the follow-up period over time. It is broken down by Completers versus Decliners. The table shows, for example, that in the 12th month of the follow-up period, there were 64 (68%) of the original 94 Decliners still in the follow-up. The table also shows that, of the Decliners who had a subsequent birth during the follow-up period, 53.8% were low birthweight. This is a cumulative percentage, and not just the percent for births in that month.

Table O

FOLLOW-UP PERIOD, STUDY SIZE AND LBW RATE BY PROGRAM STATUS

FOLLOW-UP PERIOD IN MONTHS	DECLINED PROGRAM			COMPLETED PROGAM		
	# OF WOMEN IN FOLLOW-UP	% STILL IN FOLLOW-UP	CUMULATIVE % LBW	# OF WOMEN IN FOLLOW-UP	% STILL IN FOLLOW-UP	CUMULATIVE % LBW
1	94	100.0%	--	150	100.0%	--
2	90	96.0%	--	139	93.0%	--
3	82	87.0%	--	132	88.0%	100.0%
4	81	86.0%	33.3%	127	85.0%	100.0%
5	77	82.0%	50.0%	125	83.0%	60.0%
6	75	80.0%	42.9%	122	81.0%	50.0%
7	73	78.0%	37.5%	120	80.0%	42.9%
8	70	74.0%	50.0%	119	79.0%	30.0%
9	69	73.0%	50.0%	115	77.0%	33.3%
10	68	72.0%	50.0%	114	76.0%	33.3%
11	66	70.0%	50.0%	109	73.0%	33.3%
12	64	68.0%	53.8%	105	70.0%	25.0%
13	61	65.0%	50.0%	100	67.0%	30.8%
14	61	65.0%	50.0%	95	63.0%	28.6%
15	56	60.0%	50.0%	91	61.0%	28.6%
16	52	55.0%	50.0%	88	59.0%	26.7%
17	51	54.0%	50.0%	86	57.0%	23.5%
18	48	51.0%	50.0%	81	54.0%	22.2%
19	44	47.0%	50.0%	76	51.0%	23.5%
20	43	46.0%	50.0%	73	49.0%	22.2%
21	42	45.0%	50.0%	71	47.0%	21.1%
22	39	41.0%	53.8%	69	46.0%	21.1%
23	39	41.0%	53.8%	67	45.0%	21.1%
24	37	39.0%	53.8%	65	43.0%	21.1%
25	36	38.0%	57.1%	62	41.0%	15.8%
26	32	34.0%	63.6%	60	40.0%	16.7%
27	30	32.0%	63.6%	54	36.0%	15.4%
28	28	30.0%	80.0%	50	33.0%	9.1%
29	28	30.0%	80.0%	45	30.0%	9.1%
30	26	28.0%	88.9%	38	25.0%	9.1%
31	26	28.0%	88.9%	36	24.0%	9.1%
32	24	26.0%	88.9%	34	23.0%	9.1%
33	22	23.0%	87.5%	28	19.0%	22.2%
34	18	19.0%	83.3%	26	17.0%	25.0%
35	16	17.0%	80.0%	22	15.0%	28.6%
36	13	14.0%	100.0%	20	13.0%	28.6%

An Examination of the Quality of Birth Certificate Data

The initial plan for the evaluation of the IHPI program included a comparison of the IHPI Completers with those who declined to participate. During that comparison, it was discovered that there were several significant differences between the Completers and the Decliners (see Tables I and J on pages 166 and 167). To remedy this situation, the Colorado Trust provided additional funds in an effort to obtain a better comparison group. As there were many more eligible women than space in the IHPI program, there were many eligible women who were never contacted. (These cases are shown as the blue area in Figure 6 on page 67.) It was thought that these women could provide a better comparison group than the program Decliners.

The analysis plan for this historical comparison included gathering birth record data from the Birth Certificate Office on subsequent births regarding birth complications and complications in the newborn. These results were then compared to previously collected data for the index births. It was hypothesized that the program Completers would show a larger reduction in complications in subsequent birth when compared to the historical comparison group. The information from the index births was collected at the beginning of the program by the case managers for the IHPI participants and by a medical chart reviewer for the historical comparison cases. However, when the birth certificate information for the index births was compared to the data collected by the IHPI staff, several significant discrepancies became apparent. These are summarized in Tables P and Q.

For very basic information, such as the birthweight of the child, whether there was a C-section performed, and the age of the mother, the birth certificate information can be reliably used. But for much of the medical data, the birth certificate data is highly inaccurate. Several of the continuous variables (Table P) showed significant differences between the birth certificate and the IHPI chart review. The birth certificate data tended to miss early prenatal visits, and so the birth certificate data show fewer visits overall, as well as prenatal care starting later than the chart review revealed. In addition, the chart review showed significantly greater gestational age at birth and significantly greater weight gain during the pregnancy. Only the mother's age, birthweight and APGAR scores did not show significant differences between the data sources.

Similar to the continuous variables, some of the discrete variables (Table Q) show substantial differences. The birth certificate data significantly underestimated the number of women with a previous fetal demise, for example. It's hard to believe, but in our sample of 338 births, the birth certificate data missed one case with microcephaly, one case of Down's Syndrome, two cases of cleft palate and one case of spina bifida, among many others. When the number of complications and anomalies are added up, the rate of inaccuracies is very significant. This issue has recently been studied in several populations and researchers are now being warned to use birth certificate data with caution (see the Reference List). These problems make the use of these data problematic for our intended purposes.

The IHPI cases were selected for the program because of their having had a very difficult pregnancy or birth. If birth certificate data are used to examine the subsequent births, the

Table P

BIRTH CERTIFICATE VS IHPI DATA ON INDEX BIRTH

	n	from BC	from IHPI chart review	t-test	p value	correlation
Mother's Age	336	23.5	23.4	-1.430	0.154	0.956
# of prenatal visits	338	6.5	7.0	-3.330	0.001	0.818
First month of PNC	303	3.9	3.3	11.275	0.000	0.826
Birth weight	338	2173.6	2170.6	0.801	0.424	0.987
1 minute APGAR	336	7.3	7.3	1.585	0.114	0.984
5 minute APGAR	336	8.5	8.5	0.000	1.000	0.981
Gestational Age at Birth	338	35.7	36.1	-6.167	0.000	0.938
Weight Gain	237	23.4	24.7	-2.439	0.015	0.805

number of problems and complications would appear to drop much more than they actually did. Since birth certificate data routinely miss important negative outcomes, the results on the subsequent births would appear much better than they were. And for other variables, such as the start of prenatal care and number of prenatal care visits, the birth certificate information would suggest a worsening of the real condition because the birth certificate data significantly miss early prenatal visits. For a comparison of this type, a more reliable source of data must be used which we do not have at this time.

References

Parrish, K., Holt, V., Connell, F., et al. Variations in the Accuracy of Obstetric Procedures and Diagnoses in Birth Records in Washington State, 1989. Am J Epidemiology 1993;138;l19-27.

Table Q

BIRTH CERTIFICATE VS IHPI DATA ON INDEX BIRTH

	n	+ in BC % + in IHPI	- in BC % - in IHPI	% validated by IHPI	+ in BC % - in IHPI	- in BC % + in IHPI	% not validated by IHPI
Married	338	65.1%	97.5%	80.8%	34.9%	2.5%	19.2%
C-section	337	98.4%	98.9%	98.8%	1.6%	1.1%	1.2%
Fetal Distress	338	34.1%	95.6%	87.6%	65.9%	4.4%	12.4%
Previous Preterm Birth	338	70.6%	88.8%	87.9%	29.4%	11.2%	12.1%
Pregnancy Associated Hypertension	338	97.3%	91.0%	91.7%	2.7%	9.0%	9.3%
Spina Bifida	338	--	99.7%	99.7%	--	0.3%	0.3%
Microcephaly	338	--	99.7%	99.7%	--	0.3%	0.3%
Cleft Lip/Palate	338	0.0%	99.4%	99.1%	100.0%	0.6%	0.9%
Down's Syndrome	338	--	99.7%	99.7%	--	0.3%	0.3%

Clark, K., Fu, C., Burnett, C. Accuracy of Birth Certificate Data Regarding the Amount, Timing, and Adequacy of Prenatal Care Using Prenatal Clinic Medical Records as Referents. Am J of Epidemiology 1997;145;68-71.

Adams, M. Validity of Birth Certificate Data for the Outcome of the Previous Pregnancy, Georgia, 1980-1995. Am. J. Epidemiol. 2001;154 883-888.

Kirby, R. The Quality of Data Reported on Birth Certificates. Am J Public Health l997;87;301.

Piper, J., Mitchel, E., Snowden, M., et al. Validation of 1989 Tennessee Birth Certificates Using Maternal and Newborn Hospital Records. Am J Epidemiology 1993;137;758-68.

Buescher, P., Taylor, K., Davis, M., et al. The Quality of the New Birth Certificate Data: A Validation Study in North Carolina. Am J Public Health 1993;83;l163-65.

Dobie, S., Baldwin, U., Rosenblatt, R., et al. How Well Do Birth Certificates Describe the Pregnancies They Report? The Washington State Experience with Low Risk Pregnancies. Maternal and Child Health Journal 1998;2;145-54.