Prenatal Plus Program

2006 Annual Report

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Program Website http://www.cdphe.state.co.us/pp/womens/PrenatalPlus.html

Prenatal Plus Program
2006 Annual Report
Executive Summary

Low infant birthweight is one of Colorado's most critical public health problems. The health and quality of life for low-birthweight infants often is compromised for many years, including possible neurological deficits, sensory deficits, learning problems, central nervous system conditions and an increased risk for attention-deficit hyperactivity disorder. Other long-term health risks include an increased risk for obesity, diabetes, stroke and osteoporosis. This results in substantial cost to families and society in the form of increased medical care, increased educational needs and lower lifetime job achievement. To improve the low-birthweight rate in Colorado, the Prenatal Plus Program addresses the behavioral, nutritional and psychosocial risks that contribute to low birthweight.

Prenatal Plus is a Medicaid-funded program that provides care coordination, nutrition and mental health counseling to Medicaid-eligible pregnant women in Colorado who are at a higher risk for delivering low-birthweight infants. The Prenatal Plus Program's unique multidisciplinary approach uses professionals to effectively address risk reduction for each woman, with the overall goal of reducing the number of low-birthweight infants born to women in the program. The program model encourages enrollment in the first or second trimester (prior to 28 weeks gestation) and provides care through delivery and up to 60 days postpartum.

Low Birthweight
5 pounds, 8 ounces or less at birth
(less than 2,500 grams)

Very Low Birthweight
3 pounds, 3 ounces or less at birth
(less than 1,500 grams)

The Prenatal Plus Program has consistently demonstrated that improved birth outcomes can be achieved among high-risk populations when behavioral, nutritional and psychosocial risks are identified and resolved. In 2006, the low-birthweight rate for infants born to Prenatal Plus participants who remained in the program through delivery was 11.4 percent. Without Prenatal Plus services, the low-birthweight rate for the Prenatal Plus population was expected to be 13.7 percent. This expected rate is based on the outcomes for women on Medicaid with the same risks who did not receive Prenatal Plus services. The Prenatal Plus rate is 16.3 percent *lower* than the expected rate and is a statistically significant difference. More than half (54 percent) of these Prenatal Plus Program participants were able to resolve **all** of their risks, and the resulting low-birthweight rate for their infants was 7.4 percent. Compared to the low-birthweight rate for Colorado in 2006, 9.0 percent, this is a significant achievement within this high-risk population. In addition, the very low-birthweight rate among program participants was 1.1 percent, less than both the 2006 Colorado rate of 1.3 percent and the Healthy People 2010 goal of 1.4 percent.

This improvement resulted in an estimated savings of $2.9 million dollars in health care costs for Medicaid during 2006. The savings are based on expected costs for the 2,137 women who received Prenatal Plus services in 2006 and their infants through their first year of life, had they not participated in the program.

Prenatal Risk Categories

Smoking*
Drugs*
Alcohol*
Psychosocial - experiences significant stress as a result of personal/family safety needs, lack of support systems or an inability to meet basic needs
Weight Gain – experiences any weight gain below the appropriate line on the weight grid, weight loss below prepregnancy weight in the first trimester, weight loss of two pounds or more in the second or third trimester or weight gain of less than two pounds per month in the second or third trimester

* At risk if any current use, use after conception or use within the three months prior to conception

Reductions in the low-birthweight rate are directly related to the reduction in risk attained by the program participants. The Prenatal Plus Program continues to achieve high resolution rates in all five of the risk categories. Among women who were smokers when they began the program, 64 percent quit before they delivered. Of the women who reported psychosocial problems, 72 percent resolved their risk during pregnancy. For women with inadequate weight gain, 69 percent gained the recommended amount of weight. A total of 90 percent of the women who reported using drugs quit, and 99 percent of the women who reported alcohol use stopped drinking during pregnancy. The significant differences in low birthweight among all women who resolved individual or multiple risks and women who did not resolve those risks underscores the fact that addressing risk and providing assistance in achieving risk resolution results in fewer low-birthweight infants.

In addition, for each of the risk categories, more women were able to resolve their risk factors if they received model care. Eighty-six percent resolved all or some of their risks compared to 79 percent among those who did not receive model care, a difference that is statistically significant ($p<.001$). The program continues to see an increase in the percentage of clients receiving model care, up to 56 percent in 2006.

Model Care

Client enrolls in the Prenatal Plus Program in the first or second trimester (prior to 28 weeks gestation) and continues through delivery and up to 60 days postpartum. The client must receive a minimum of ten contacts, two of which must be home or off-site visits, with the Prenatal Plus staff.

Only a fraction of the women who are eligible for Prenatal Plus services in Colorado are receiving them. An estimated 17,000 additional Medicaid-eligible women could benefit from program services. Increasing provider participation could result in significant health benefits for more clients, along with a greater cost savings for Medicaid.

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Prenatal Plus Program
2006 Annual Report

INTRODUCTION

Low birthweight[1] is one of Colorado's most critical public health problems. The health and quality of life for low-birthweight infants often is compromised for many years, resulting in substantial cost to families and society related to increased medical needs, long-term learning problems, dependence on programs that serve special-needs individuals and ongoing challenges to families caring for low-birthweight infants. To reduce the low-birthweight rate[2] in Colorado, the Prenatal Plus Program addresses the behavioral, nutritional and psychosocial risks that contribute to low birthweight. Prenatal Plus is a Medicaid-funded program that addresses these risk factors through care coordination, nutrition and mental health counseling to Medicaid-eligible pregnant women. Program services enhance the medical component of prenatal care. The program identifies and enrolls women who are at a higher risk for delivering low-birthweight infants using risk factors shown in research to be contributors to low birthweight. The goal is to improve birth outcomes by reducing the number of low-birthweight infants born to women in the program. This report summarizes the achievements of the Prenatal Plus Program during 2006.

The Prenatal Plus team consists of a care coordinator, registered dietitian and mental health professional. The team works with each client to improve her psychosocial and nutritional health status; assist her in developing and maintaining a healthy lifestyle during pregnancy and postpartum, especially discouraging the use of tobacco, alcohol, and illicit drugs; and increase her ability to appropriately use resources, including medical and social services. Care coordinators address client needs throughout pregnancy and up to 60 days postpartum, referring clients to the registered dietitian and mental health professional as needed. Concerns addressed include housing, nutrition, employment, domestic violence, substance abuse, high life stress, depression and/or other mental health problems that may increase the risk of delivering a low-birthweight infant. The program's unique multidisciplinary approach uses professionals with expertise in the varied risk areas to effectively address risk reduction for each woman, while working together as a team to ensure the provision of comprehensive care throughout pregnancy.

The Prenatal Plus Program is a partnership between the Colorado Department of Public Health and Environment and the Colorado Department of Health Care Policy and Financing. Prenatal Plus services are provided at county health departments, county nursing services, community health centers, and private nonprofit agencies.

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[1] 5 pounds, 8 ounces or less at birth (fewer than 2,500 grams)

[2] The rate is determined by the number of births at 5 pounds, 8 ounces or less divided by the total number of births, expressed as a percentage. This rate is used commonly to assess the level of health in a group of births.

PROGRAM CASELOAD

In 2006, 2,137 women were enrolled in the Prenatal Plus Program. A total of 1,576 mothers completed the program, delivering 1,598 infants. (Twenty-two women had twins.) A total of 561 women withdrew from the program prior to delivery. Of those women who withdrew, 45 transferred care to other providers, 100 moved, 164 could not be located despite follow-up, 70 experienced miscarriages or fetal deaths, 155 declined further care, and 15 discontinued for unknown reasons.

Starting in 2005, enrollment criteria changed to ensure that services would be focused on those at highest risk for having low weight births. In 2006, nine out of 10 (88.2 percent) women qualifying for the program met one or more of the six key enrollment criteria[3]: history of low birthweight, 17 years of age or less, recent or current smoker, recent or current drug user, recent or current alcohol user, and/or prepregnancy underweight (BMI <19.8 kg/m^2).[4] The high number of women meeting one or more of these key criteria demonstrates that the program is effectively targeting the population at the highest risk of delivering a low-birthweight infant. The other 12 percent of women enrolled in the program met a minimum of three of the additional criteria that in combination increase the likelihood of a low-birthweight infant. These enrollment criteria include recent delivery; inadequate weight gain; education level less than appropriate for age; history of or current domestic violence; history of abuse in childhood; high life stress; history of or current psychiatric diagnosis, including depression; not married; cognitive or developmental disability; age 18 at time of delivery; and age 35 or greater at time of delivery.

Twenty-four agencies provided Prenatal Plus services in 22 counties around the state in 2006. One new Prenatal Plus provider is located in Walsenburg (Huerfano County) at Spanish Peaks Regional Health Center. Two Prenatal Plus agencies, El Paso County Public Health and Chaffee County Public Health, chose to discontinue Prenatal Plus services during 2006 due to a lack of local agency financial resources and low program enrollment. A list and map of the 2006 program sites are located on pages 14 and 15 of the Appendix.

Only a fraction of the women who are eligible for Prenatal Plus services in Colorado are receiving them. Medicaid paid for prenatal care for more than 27,000 women in 2006 (out of more than 70,000 total Colorado births). The most recent data available estimate seven out of every 10 (71 percent) pregnant women receiving Medicaid have risks that would qualify them for the Prenatal Plus Program.[5] Therefore, there are an estimated 17,000 additional women who could benefit from the services of Prenatal Plus. Increased participation in the program would result in significant health benefits for more clients and greater cost savings for Medicaid.

[3] Key enrollment criteria refer to risk factors in the literature that are shown to be associated with low birthweight. A client needs only one of the listed factors to be eligible for program services.

[4] Full definitions of enrollment criteria can be found on the Prenatal Plus Intake Form at http://www.cdphe.state.co.us/pp/womens/PNPlusManual/IntakeForm.pdf

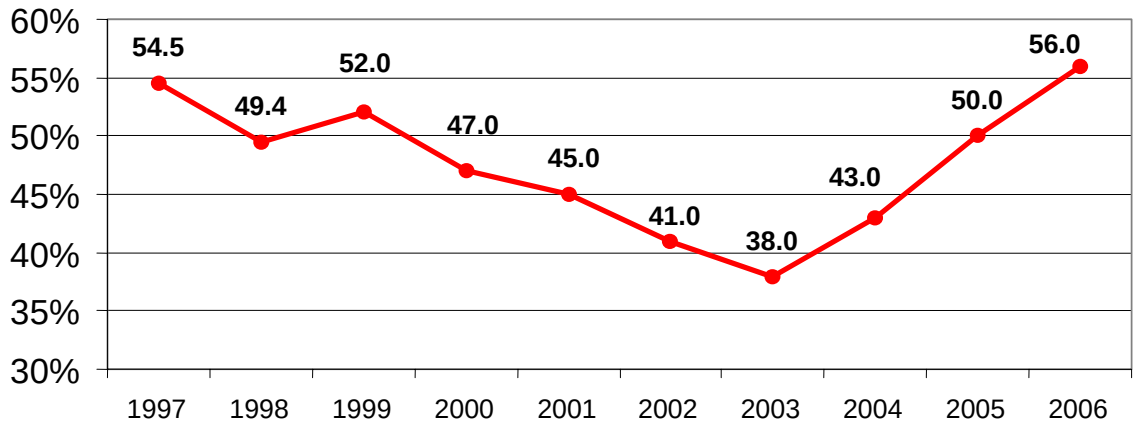
[5] Pregnancy Risk Assessment Monitoring System (PRAMS) data, 2000-2003

MODEL CARE

The Prenatal Plus Program model encourages enrollment in the first or second trimester (prior to 28 weeks gestation) and provides care through delivery and up to 60 days postpartum. In 2006, 84 percent of women enrolled in the program during the first or second trimester. Nearly three-quarters (74 percent) of women enrolled in the program received services through delivery. The client must receive a minimum of 10 encounters, two of which must be home or off-site visits, with Prenatal Plus staff members. This model is based on program data, which indicate that this level of care produces the best health outcomes for pregnant women and their infants, since risk resolution and low-birthweight rates improve.

Several changes in recent years have concentrated services on those women who have the best chance of receiving model care. In July 2005, the Presumptive Eligibility Medicaid benefit was reinstated, and women who receive this benefit now are more likely to qualify for regular Medicaid status. This change led to an increase in the number of Medicaid-eligible women who can remain in the program through delivery and receive model care. Additionally, starting in 2004, the Prenatal Plus Program and Medicaid implemented a revised reimbursement structure. This structure provides a greater incentive for model care and encourages early enrollment, since model care services can be provided only to women who enroll in the program prior to 28 weeks gestation. As a result, the program has experienced a significant increase in the percentage of women receiving model care to the highest rate ever achieved: 56 percent in 2006 (Figure 1).

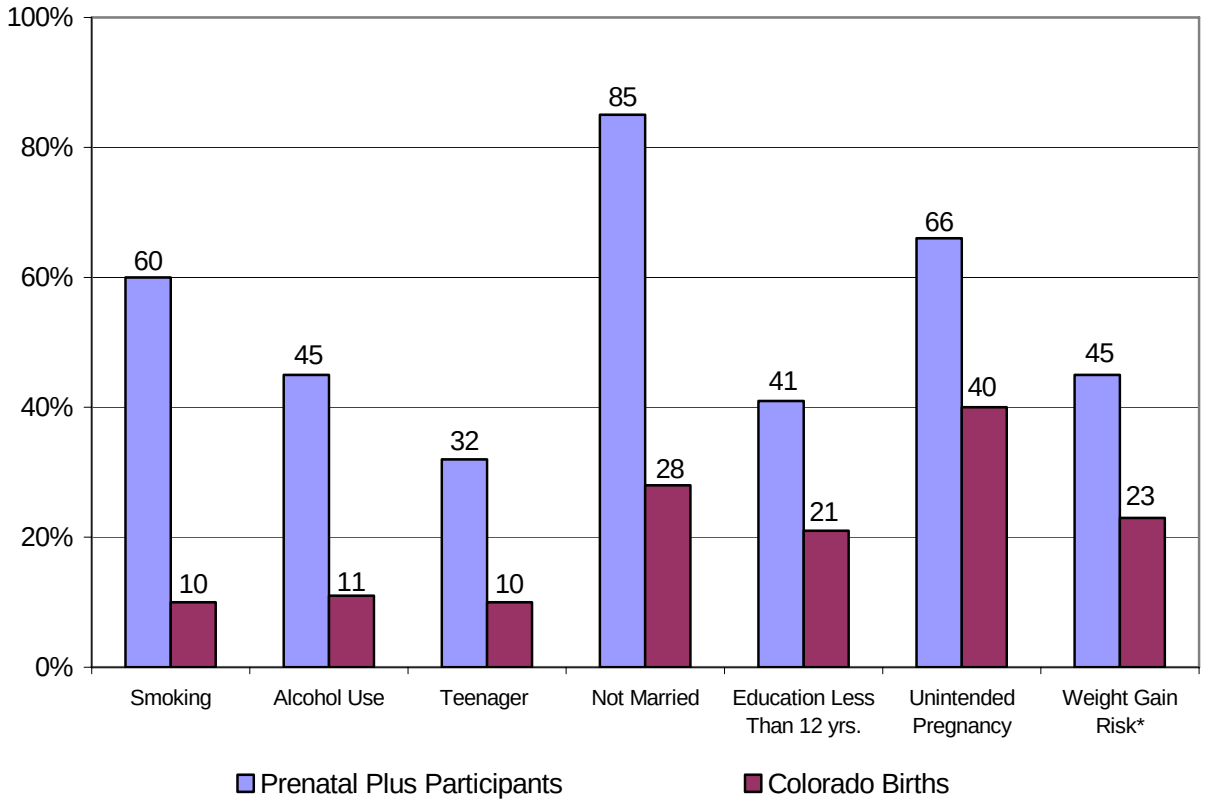
Figure 1: Percent of Deliverers Receiving Model Care



CHARACTERISTICS AND RISK FACTORS

The Prenatal Plus Program targets pregnant women in Colorado at risk for delivering a low-birthweight infant. Beginning in 2005, the Prenatal Plus Program has served a higher risk cohort of women than in previous years due to changes in the eligibility criteria. A higher percentage of the women smoke, abuse substances and gain weight inadequately during pregnancy compared to women enrolled in the program prior to 2005. (See Table 1 on page 17 of the Appendix for comparison data.) In addition, compared to all women giving birth in Colorado, Prenatal Plus clients are much more likely to smoke and abuse substances; are disproportionately young, unmarried and less educated; and also experience more inadequate weight gain and psychosocial problems (Figure 2). Comparable data are not available for all risks.

Figure 2: Comparison of Characteristics and Initial Risk Factors
Prenatal Plus Participants
vs. All Women Giving Birth in Colorado, 2006



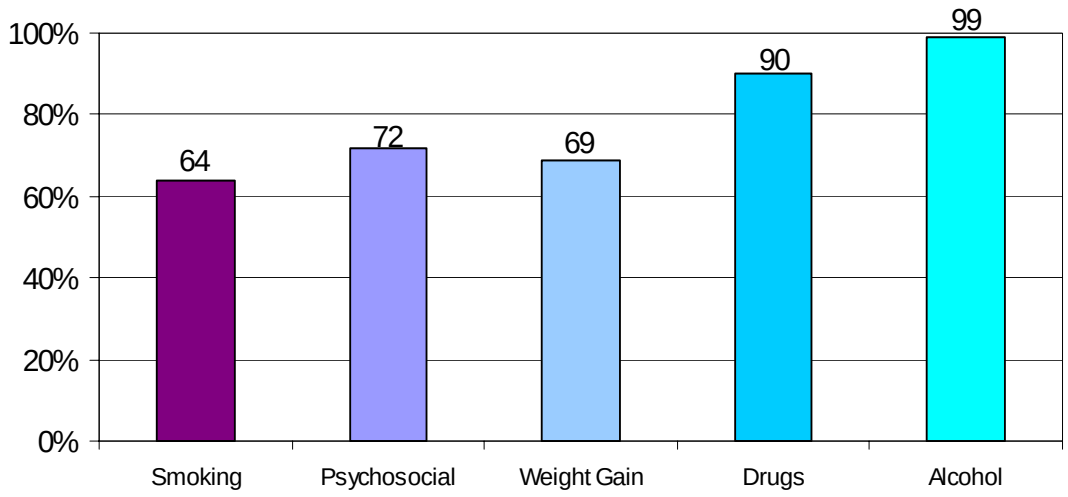
* Weight gain risk includes only women with inadequate prenatal weight gain, defined as any weight gain below the appropriate line on the weight grid, weight loss below prepregnancy weight in the first trimester, weight loss of two pounds or more in the second or third trimester, or weight gain of less than two pounds per month in the second or third trimester.

RISK RESOLUTION RATES

Despite serving a higher-risk population than in previous years, the Prenatal Plus Program continues to attain high resolution rates in all five of the risk categories. Risk resolution entails quitting smoking; ceasing alcohol or drug use; gaining the recommended amount of weight during pregnancy; and adequately addressing psychosocial problems such as homelessness, domestic violence or depression[6].

Figure 3 illustrates risk resolution rates for women who delivered in the Prenatal Plus Program during 2006. Among women who were smokers when they began the program, 64 percent quit before they delivered. Compared to the rate of smoking cessation in the general population of pregnant women in Colorado (50 percent)[7], this is a very high cessation rate. Of the women who reported psychosocial problems, 72 percent resolved their risk during pregnancy. For women at weight-gain risk, 69 percent gained the recommended amount of weight. A total of 90 percent of the women who reported using drugs quit, and 99 percent of the women who reported alcohol use stopped drinking during pregnancy.

Figure 3: Risk Resolution Rates Among Deliverers, 2006



The Prenatal Plus Program also assists women with multiple risk factors, as seen in Figure 4. The percentages of women who resolve more than one risk factor are lower, as the task is more difficult. Among women with psychosocial and weight-gain risks, 54 percent were able to resolve both risks by the end of pregnancy. For women who smoke in addition to demonstrating psychosocial and weight-gain risks, 38 percent were able to resolve all three risks. Other combinations yielded resolution rates that were greater than 45 percent. Among all women delivering[8], more than half (54 percent) were able to resolve *all* their risks, 29 percent were able to resolve some of their risks and only 17 percent were unable to resolve any of their risks.

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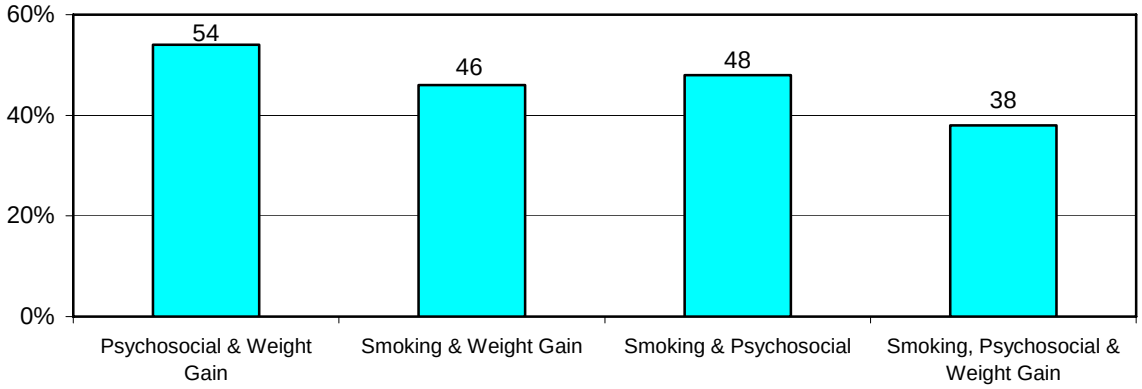
[6] Risk resolution for smoking, alcohol and drug use is based on clients' self-report of use at the end of pregnancy. Weight gain resolution is determined by recording client weight at each visit. Psychosocial resolution is achieved if the client has taken action to address the problem so that it no longer causes severe stress or no longer exists.

[7] Pregnancy Risk Assessment Monitoring System (PRAMS) data, 2005

[8] Data are reported only for women with known risk resolution rates.

Figure 4: Risk Resolution Rates for Combinations of Risks Among Deliverers, 2006



Risk reduction increased among women receiving model care. Eighty-six percent resolved all or some of their risks compared to 79 percent of those who did not receive model care, a difference that is statistically significant ($p<.001$). For each of the risk categories, a larger percentage of women were able to resolve their risk factors if they received model care. For example, among smokers receiving model care, 68 percent quit compared to 58 percent of smokers who did not get model care. This demonstrates that the biggest benefits in risk reduction occur among participants receiving model care.

LOW BIRTHWEIGHT

The number of low-birthweight infants born in the United States and in Colorado has been increasing in recent years. Colorado reached its highest low-birthweight rate in 35 years in 2005 (9.3 percent), with the rate decreasing slightly to 9.0 percent in 2006. The low-birthweight rate among Prenatal Plus participants was 11.4 percent in 2006[9]. The program's low-birthweight rate has increased in recent years, mirroring the increase in the low-birthweight rate in the general population. In addition, it appears that some of the increase in the Prenatal Plus low birthweight can be attributed to the higher level of risk found in Medicaid recipients enrolled in the program since changes were made in 2005.

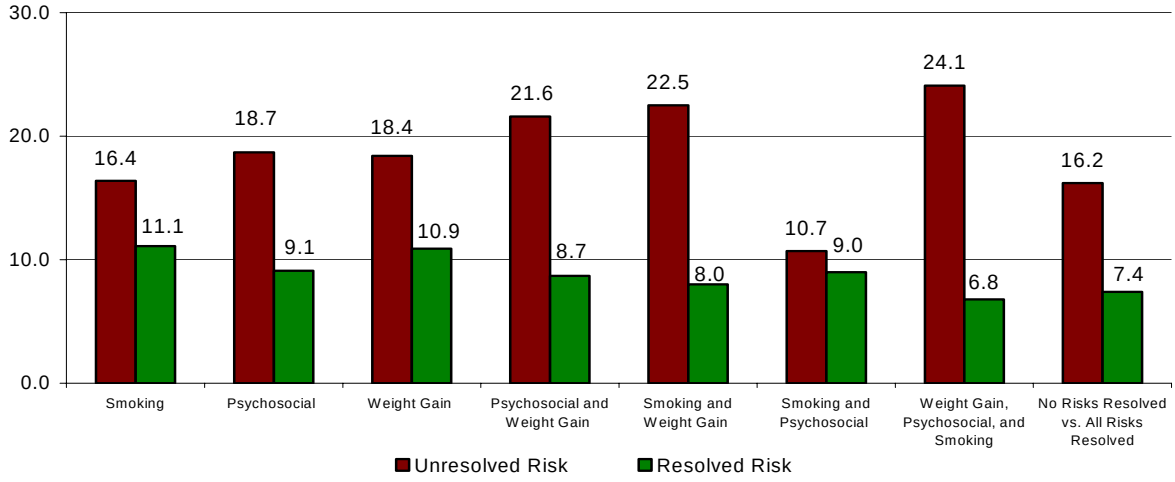
However, the 11.4 percent low-birthweight rate is 16.3 percent *lower* than the expected rate, a statistically significant difference. Without Prenatal Plus services, the low-birthweight rate for the Prenatal Plus population was expected to be 13.7 percent. This expected rate is based on the outcomes for women on Medicaid with the same risks who did not receive Prenatal Plus services. Of the 1,598 infants born to Prenatal Plus participants, only 182 infants were at a low birthweight. Without Prenatal Plus services, these women would have been expected to deliver 218 low-birthweight infants. The Prenatal Plus Program therefore averted an estimated 36 low-birthweight births during 2006.[10] Since the Prenatal Plus Program began in 1996, an estimated 875 infants have been born at normal weight, which were otherwise expected to be at a low birthweight.

[9] The low-birthweight rate is calculated for those women who remained in the program through delivery. No data are available for the birth weights of infants born to women who left the program before delivery.

[10] The estimates of the reduction in the number of low weight births are based on the experience of other women on Medicaid who had the same risk factors as Prenatal Plus clients, but who were not enrolled in the program. Data for this group of women are based on Pregnancy Risk Assessment Monitoring System surveys for 2000-2005.

Figure 5 demonstrates differences in low-weight births among women who resolved individual or multiple risks and women who did not resolve those risks; all of these differences achieved statistical significance. For women who quit smoking during pregnancy, the low-birthweight rate was 11.1 percent. For women unable to quit smoking, the rate was 16.4 percent. Among women who resolved psychosocial risk, the low-birthweight rate was 9.1 percent; among those unable to resolve this risk, the low-birthweight rate was 18.7 percent. When Prenatal Plus Program participants who were able to resolve all their risks are grouped together, regardless of the number of risks[11], the low-birthweight rate is 7.4 percent. By contrast, Prenatal Plus women who did not resolve any of their risks had a significantly higher low-birthweight rate of 16.2 percent. These differences underscore the fact that achieving risk resolution results in fewer low-birthweight infants.

Figure 5 : Low Birthweight Rates for Prenatal Plus Clients
Unresolved Risks vs. Resolved Risks, 2006 Deliveries



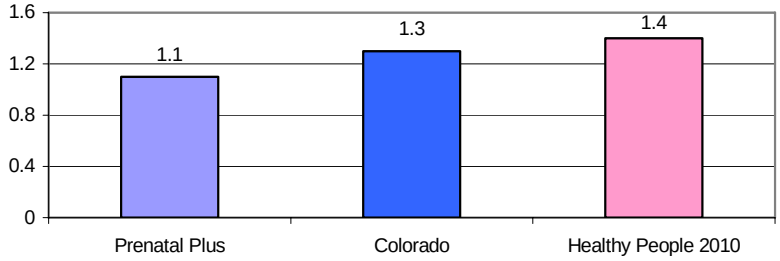
Program data have consistently shown that women who are able to resolve their risks are less likely to deliver a low-birthweight infant. An analysis of the Prenatal Plus Program and its success with reducing low birthweight appeared in the November 2005 issue of the *American Journal of Public Health*, "Reducing Low Birthweight by Resolving Risks: Results from Colorado's Prenatal Plus Program."[12]

[11] This group consists of women who were at risk for weight gain and/or smoking and/or psychosocial problems and excludes those who were at risk only for drugs and/or alcohol. However, virtually all women at drug and/or alcohol risk also were at risk for weight gain, smoking or psychosocial problems.

[12] Ricketts et al., "Reducing Low Birthweight by Resolving Risks: Results from Colorado's Prenatal Plus Program," *American Journal of Public Health*, November 2005, p.1952-57.

The Prenatal Plus Program has also had an impact on the number of very low-birthweight[13] infants born to participants. In 2006, the very low-birthweight rate for the program was 1.1 percent, less than both the 2006 Colorado rate of 1.3 percent and the Healthy People 2010 goal of 1.4 percent. An infant born at this weight often has considerable complications requiring extended stays in the neonatal intensive care unit, as well as lifelong disabilities.

Figure 6: Very Low Birthweight Rate Comparison, 2006: Prenatal Plus vs. Colorado and Healthy People 2010 Goal



COST SAVINGS TO MEDICAID, 2006

The Prenatal Plus Program cost study report, *The Effects of the Prenatal Plus Program on Infant Birth Weight and Medicaid Costs*, demonstrates the program's effectiveness in reducing Medicaid costs associated with low birthweight.[14] The study, completed in 2001, shows that for every $1 spent on Prenatal Plus services, $2.48 is saved in Medicaid costs annually. For each infant born, the savings are estimated at $1,376[15]. Costs for low-birthweight infants are five to nine times higher than a normal weight infant. Savings are found for all infants and mothers in the program because their health costs are lower than for other eligible Medicaid mothers not in the program and their infants. In 2006, the Prenatal Plus Program saved Medicaid an estimated $2.9 million in health care costs for the 2,137 women who received Prenatal Plus services and their infants through their first year of life. However, focusing only on the cost savings does not fully recognize the long-term impact of low birthweight since the health and quality of life for low-birthweight infants often is compromised for many years.

[13] 3 pounds, 3 ounces or less at birth (fewer than 1,500 grams)
[14] Complete cost study report available at http://www.cdphe.state.co.us/pp/womens/PrenatalPlus.html.
[15] Adjusted for 2006 costs using Bureau of Labor Statistics Data; Consumer Price Index: Medical care http://www.bls.gov/cpi/home.htm

SUMMARY

In 2006, Prenatal Plus Program participants experienced a decrease in the rate of low-birthweight infants from the expected rate of 13.7 percent to the actual rate of 11.4 percent, a difference that is statistically significant. In addition, the significant differences in low-weight births among all women who resolved individual or multiple risks and women who did not resolve those risks underscores the fact that achieving risk resolution results in fewer low-birthweight infants. The vast majority of women in the program were able to resolve all or some of their risk factors and consequently achieve improved birth outcomes. For those women able to resolve all their risks, the low-birthweight rate for their infants was 7.4 percent.

Model care further increases the proportion of women who are able to resolve their risks. Eighty-six percent resolved all or some of their risks compared to 79 percent of those who did not receive model care, which is a statistically significant difference. During the past three years, the program has seen a significant increase in the percentage of women who are receiving model care, from 38 percent to 56 percent.

An increasing rate of low-birthweight infants in Colorado is a major concern due to the considerable financial and societal costs. Infants weighing less than 5 pounds, 8 ounces at birth are more likely to experience costly medical interventions and health problems that can continue throughout their lives. The estimated savings from the Prenatal Plus Program of $2.9 million to Medicaid is substantial. This does not account for the considerable cost savings for the infant beyond the first year of life.

The Prenatal Plus Program continually looks at ways to increase enrollment in the program along with increasing provider participation. Increased provider participation would result in significant health benefits for more clients and greater cost savings for Medicaid. However, limited reimbursement is a barrier to increasing the number of providers for Prenatal Plus and is most often the reason agencies choose to discontinue services.

Low birthweight is one of Colorado's most critical public health problems. Improving the low-birthweight rate in Colorado requires addressing the behavioral, nutritional and psychosocial risks that contribute to poor birth outcomes. The Prenatal Plus Program has consistently demonstrated that excellent health outcomes can be achieved when risks are identified and resolved. Over the past 11 years, the program has had a substantial positive impact on the health of mothers and their infants. Continuing to offer these services to the high-risk Medicaid population is essential to reducing the state's low-birthweight rate and creating a healthier Colorado.

Appendix

PRENATAL PLUS PROGRAM PROVIDERS, 2006 14

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TABLE 1: CHARACTERISTICS AND INITIAL RISK FACTORS 17

TABLE 2: LOW-BIRTHWEIGHT RATES - RISK RESOLVED VS. UNRESOLVED 18

Prenatal Plus Program Providers, 2006

Boulder County Health Department- Genesis Program: Boulder and Longmont

Clear Creek County Nursing Service: Idaho Springs

Clinica Campesina: Lafayette, Northglenn and Denver

Colorado Adolescent Maternity Program- University Hospital: Aurora

First Steps of Weld County: Greeley

Fremont County Nursing Service: Canon City

Garfield County Public Health Nursing Service: Glenwood Springs

Healthy Beginnings: Loveland

Jefferson County Health Department: Arvada, Lakewood and Conifer

Kit Carson County Health and Human Services: Burlington

Larimer County Health Department: Estes Park, Ft. Collins

Montezuma County Health Department: Cortez

Northwest Colorado Visiting Nurse Association: Craig and Steamboat Springs

Peak Vista Community Health Center: Colorado Springs

Planned Parenthood of the Rocky Mountains: Denver

Pueblo City/County Health Department: Pueblo

Pueblo Community Health Center: Pueblo

Salud New Horizons Teen Clinic: Brighton

San Juan Basin Health Department: Durango and Pagosa Springs

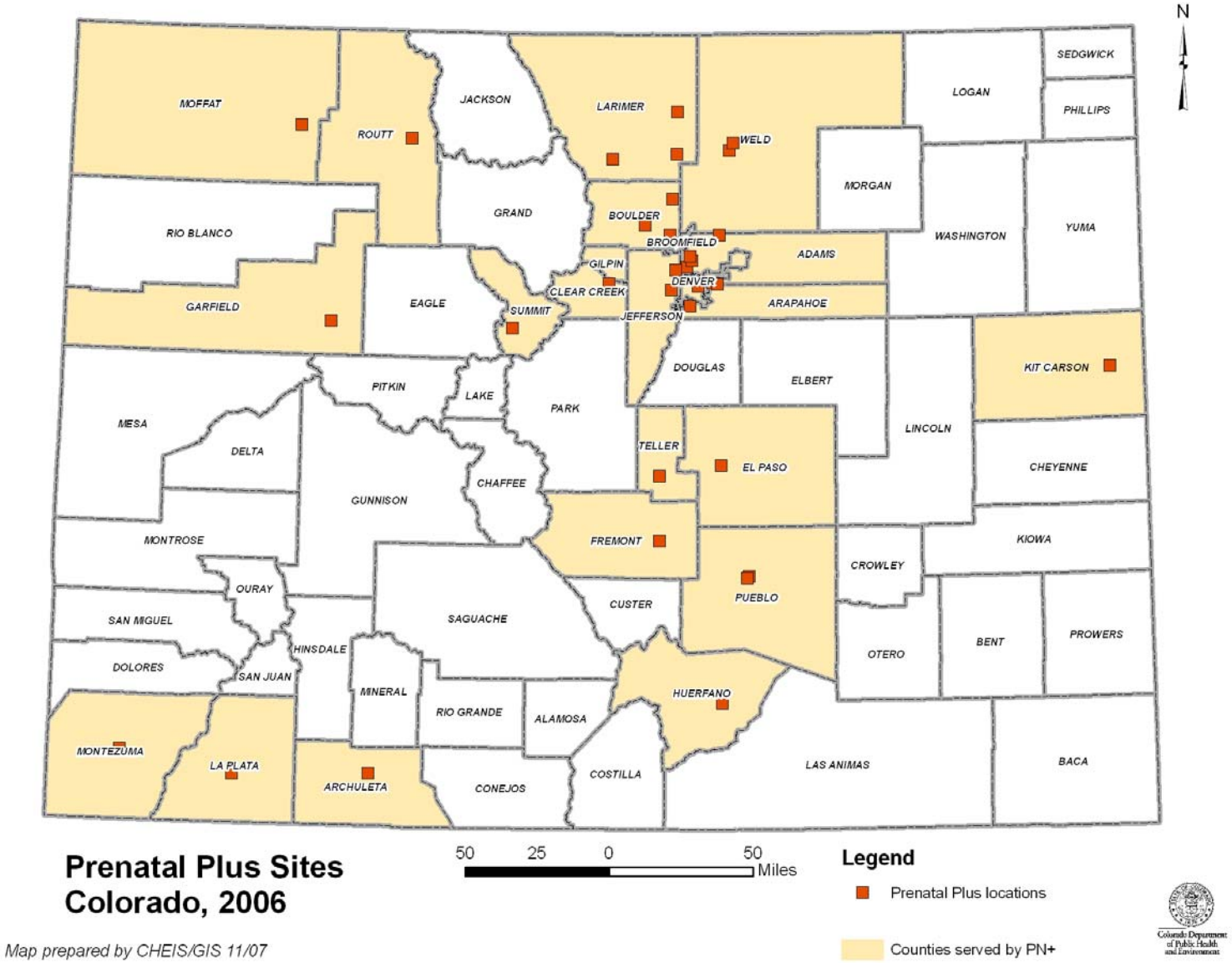
Spanish Peaks Regional Health Center: Walsenburg

Summit County Nursing Service: Frisco

Teller County Public Health: Woodland Park

Tri-County Health Department: Aurora, Englewood, Northglenn

Weld County Health Department: Greeley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MOFFAT
ROUTT
JACKSON
LARIMER
WELD
SEDGWICK
LOGAN
PHILLIPS
MORGAN
GRAND
BOULDER
RIO BLANCO
BROOMFIELD
WASHINGTON
YUMA
ADAMS
GILPIN
DENVER
CLEAR CREEK
GARFIELD
EAGLE
SUMMIT
JEFFERSON
ARAPAHOE
KIT CARSON
DOUGLAS
ELBERT
PITKIN
LAKE
PARK
MESA
LINCOLN
DELTA
TELLER
EL PASO
CHEYENNE
CHAFFEE
GUNNISON
FREMONT
KIOWA
MONTROSE
CROWLEY
OURAY
PUEBLO
CUSTER
SAN MIGUEL
SAGUACHE
OTERO
BENT
PROWERS
HINSDALE
DOLORES
SAN JUAN
MINERAL
RIO GRANDE
ALAMOSA
HUERFANO
MONTEZUMA
LA PLATA
ARCHULETA
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LAS ANIMAS
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Miles
Legend
Prenatal Plus locations
Counties served by PN+
Prenatal Plus Sites
Colorado, 2006
Map prepared by CHEIS/GIS 11/07
Colorado Department of Public Health and Environment

Risk Definitions

Alcohol Risk: A woman is at alcohol risk if she reports any current use of alcohol; any alcohol use after conception, including prior to pregnancy confirmation; any use within the three months prior to conception.

Drug Risk: A woman is at drug risk if she reports any current use of marijuana, cocaine, heroin, amphetamines or other illicit drug, or misuse of prescription drugs; any use after conception, including prior to pregnancy confirmation; any use within the three months prior to conception.

Psychosocial Risk: A woman is at psychosocial risk if she is experiencing significant or severe stress as a result of personal/family safety needs, lack of support systems, or an inability to meet her basic needs. Examples of psychosocial risk include, but are not limited to domestic violence; sexual assault; child abuse/neglect; lack of food, clothing or shelter; lack of transportation; lack of family/biological father's support/involvement; or diagnosable mental illness.

Smoking Risk: A woman is at smoking risk if she reports any current use of tobacco; any tobacco use after conception, including prior to pregnancy confirmation; any use within the three months prior to conception.

Weight-Gain Risk: A woman is at weight-gain risk if she has experienced at any time during pregnancy weight gain below the appropriate line on the weight grid, weight loss below prepregnancy weight in the first trimester, weight loss of two pounds or more in the second or third trimester or weight gain of less than two pounds per month in the second or third trimester.

Risk Resolution: A client stops the risk behavior: quits smoking, quits drinking, quits drug use, gains an adequate amount of weight during pregnancy or improves psychosocial issues to a point where they no longer constitute serious problems.

Table 1
Characteristics and Initial Risk Factors of Women in the Prenatal Plus Program, 2003-2006

Characteristic/ Initial Risk Factor	Percent of Prenatal Plus Clients with Characteristic or Initial Risk Factor				Percent of All Women Giving Birth in Colorado
	2003 n=3,516	2004 n=3,759	2005 n=2,354	2006 n=2,137	2006 n=70,737
Smoking	42	43	56	60	10*
Alcohol Use	28	29	43	45	11*
Drug Use	14	17	22	27	n.a.
Teenager (19 or younger)	30	32	32	32	10▲
Not Married	77	81	81	85	28▲
Education Less Than 12 Years	54	54	43	41	21▲
Unintended Pregnancy	70	69	66	66	40*
Weight Gain Risk	39	40	45	45	23*
Psychosocial Risk	75	74	72	66	n.a.
Psychosocial and Weight Gain Risk	30	32	34	32	n.a.
Smoking and Weight Gain Risk	15	16	23	27	n.a.
Smoking and Psychosocial Risk	32	33	42	41	n.a.

* Pregnancy Risk Assessment Monitoring System (PRAMS), based on a random sample of births (2005)

▲ Information from 2006 Colorado birth certificate data.

n.a. Indicates information is not available from Colorado birth certificate data or PRAMS data.

Table 2
Low-birthweight Rates Among Prenatal Plus Program Clients Who Delivered: Risk Resolved vs. Risk Unresolved, 2006[16]

Risk Factors	Low-birthweight Rates (%)		P**
	Risk Resolved	Risk Unresolved*	
Smoking	11.1	16.4	0.02
Psychosocial	9.1	18.7	0.001
Weight Gain	10.9	18.4	0.01
Psychosocial and Weight Gain	8.7	21.6	0.001
Smoking and Weight Gain	8.0	22.5	0.001
Smoking and Psychosocial	9.0	10.7	0.001
Weight Gain, Psychosocial and Smoking	6.8	24.1	0.001
All Risks Resolved vs. None Resolved	7.4	16.2	0.001

* Unresolved includes women who were unable to resolve the specified risk or risks during pregnancy.

** Chi-square tests comparing the low-birthweight rates for clients who resolved risk vs. those who did not yielded the levels of significance shown. A value of .001 means there is less than a 1/1000 likelihood that the results happened by chance. A value of .01 means there is less than a 1/100 likelihood that the results happened by chance. A value of .02 means there is less than a 1/50 likelihood that the results happened by chance.

[16] The low-birthweight rates shown in Table 2 are calculated for those women who remained in the Prenatal Plus Program through delivery. No information is available on the birth weights of the infants of women who left the Prenatal Plus Program before delivery.