

Prenatal Plus Program

2007 Annual Report



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

Prenatal Plus Program 2007 Annual Report Executive Summary

Low birthweight is one of Colorado's most critical public health problems. The health and quality of life for low birthweight infants often are 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 in Colorado, the Prenatal Plus Program addresses the behavioral, nutritional and psychosocial risks that contribute to low birthweight. The goal is to reduce the number of low birthweight infants born to women in the program.

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 multidisciplinary approach uses professionals to effectively address risk reduction for women enrolled in the program. The program encourages enrollment in the first or second trimester (prior to 28 weeks gestation) and provides care through delivery and up to 60 days postpartum.

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 2007, the low birthweight

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

rate for infants born to Prenatal Plus participants who remained in the program through delivery was 10.7 percent. Without Prenatal Plus services, the low birthweight rate for the Prenatal Plus population was expected to be 13.8 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 22.5 percent *lower* than the expected rate. Six out of 10 (61 percent) Prenatal Plus Program participants were able to resolve **all** of their risks, and the resulting low birthweight rate for their infants was 7.2 percent. Compared to the low birthweight rate for Colorado in 2007 of 9 percent, this is a significant achievement.

This reduction in the low birthweight rate resulted in an estimated savings of \$2.7 million dollars in health care costs for Medicaid during 2007. The savings are based on expected costs for the 1,893 women who received Prenatal Plus services in 2007 and their infants through their first year of life, if they had 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 decreases in risk achieved by the women enrolled in Prenatal Plus. 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, 66 percent quit before they delivered. Of the women who reported psychosocial problems, 80 percent resolved their risk during pregnancy. For women with inadequate weight gain during pregnancy, 72 percent gained the recommended amount of weight before delivery. A total of 92 percent of the women who reported using drugs guit, and 99 percent

of the women who reported alcohol use stopped drinking during pregnancy. The significant differences in low birthweight infants among women who resolved individual or multiple risks and women who did not resolve those risks underscores the fact that providing assistance to achieve 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. Ninety-one percent of participants receiving model care resolved all or some of their risks compared to 77 percent among those who received fewer visits, a difference that is statistically significant (p<.001). The percentage of clients receiving model care increased to 63 percent in 2007.

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 10 contacts, two of which must be home or off-site visits, with the Prenatal Plus staff.

Only about 13 percent of the women who are eligible for Prenatal Plus services in Colorado are receiving them. An additional 13,100 Medicaid-eligible women could benefit from program services. Increasing provider participation could result in significant health benefits for more clients and greater cost savings for Medicaid.

Table of Contents

4
5
6
7
8
9
11
11
12
13 14 15 16 17

Prenatal Plus Program 2007 Annual Report

INTRODUCTION

Low birthweight¹ is one of Colorado's most critical public health problems. The health and quality of life for low birthweight infants often are 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 rate² in Colorado, the Prenatal Plus Program addresses the behavioral, nutritional and psychosocial risks that contribute to low birthweight, enhancing the medical component of prenatal care. Prenatal Plus is a Medicaid-funded program that addresses these risk factors by providing care coordination, nutrition and mental health counseling to Medicaid-eligible pregnant women. The program identifies and enrolls women who are at a higher risk for delivering low birthweight infants using risk factors shown by research to be contributors to low birthweight. This report summarizes the results of the Prenatal Plus Program during 2007.

At each local health agency, the Prenatal Plus team consists of a care coordinator, registered dietitian and mental health professional. The team works with an individual client to improve her psychosocial and nutritional health status, assisting her in developing and maintaining a healthy lifestyle during pregnancy and postpartum. Counseling focuses on discouraging the use of tobacco, alcohol and illicit drugs while increasing the client's 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, and depression and/or other mental health professionals develop an individualized plan to reduce risks for each woman, while working together as a multidisciplinary team to ensure comprehensive care throughout pregnancy.

The Prenatal Plus Program is managed collaboratively by 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 throughout Colorado.

¹ The percent of infants that weigh 5 pounds, 8 ounces or less at birth (fewer than 2,500 grams)

² The rate is determined by the number of newborns weighing 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 2007, 1,893 women were enrolled in the Prenatal Plus Program statewide. A total of 1,458 mothers completed the program, delivering 1,480 infants. (Twenty-two women had twins.) Four hundred thirty-five women withdrew from the program prior to delivery. Of those who withdrew, 34 transferred care to other providers, 96 moved, 112 could not be located despite follow-up, 61 experienced miscarriages or fetal deaths, 116 declined further care, and 16 discontinued for unknown reasons.

In 2007, nine out of 10 (90.5 percent) women qualifying for the program met one or more of the six key enrollment criteria³: 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/m²).⁴ The large number of women meeting one or more of these enrollment factors demonstrates that the program is effectively serving the population at the highest risk of delivering a low birthweight infant. The other 9.5 percent of women enrolled in the program met a minimum of three additional risks 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 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-one agencies provided Prenatal Plus services in 22 counties in Colorado in 2007. Three Prenatal Plus agencies, Pueblo City/County Health Department, Spanish Peaks Regional Health Center and Weld County Health Department, chose to discontinue Prenatal Plus services during 2007 due to finances and low program enrollment. A list and map of the 2007 program sites are located on pages 14 and 15 of the Appendix.

Only about 13 percent of the women who are eligible for Prenatal Plus services in Colorado are receiving them. Out of 70,804 total births to Colorado residents in 2007, Medicaid paid for prenatal care for an estimated 24,400 women. Six out of every 10 (61 percent) Medicaid-eligible pregnant women, a total of 14,900, have risks that would qualify them for the Prenatal Plus Program.⁵ Therefore, there are an additional 13,100 women who could benefit from the services of Prenatal Plus. Increased participation in the program will result in significant health benefits and greater cost savings for Medicaid.

³ Key enrollment criteria refer to risk factors in the research 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 <u>http://www.cdphe.state.co.us/pp/womens/PNPlusManual/IntakeForm.pdf</u>

⁵ Pregnancy Risk Assessment Monitoring System (PRAMS) data, 2004-2006.

MODEL CARE

The Prenatal Plus Program encourages enrollment in the first or second trimester (prior to 28 weeks gestation) and provides care through delivery and up to 60 days postpartum. 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 of care is based on program data, which indicate that these numbers and types of visits produce the best health outcomes for pregnant women and their infants, because more women resolve their risks.

In 2007, 90 percent of women enrolled in the program during the first or second trimester, and more than three-quarters (76 percent) received services through delivery. Since 2003, the program has experienced a significant increase in the percentage of women receiving model care, reaching 63 percent in 2007 (Figure 1), the highest ever recorded. This trend corresponds with an increase in reimbursement rates, which may have resulted in an increased number of women receiving model care.



Figure 1: Percent Receiving Model Care of Clients Who Delivered, 2000-2007

CHARACTERISTICS AND RISK FACTORS

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 a higher incidence of inadequate weight gain and psychosocial problems (Figure 2). See Table 1 on page 17 of the Appendix for more detailed comparison data.



Figure 2: Comparison of Characteristics and Initial Risk Factors Prenatal Plus Participants in 2007 vs. All Women Giving Birth in Colorado in 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 fewer than two pounds per month in the second or third trimester.

RISK RESOLUTION RATES

Risk resolution is determined by the percent of women who quit smoking; cease alcohol or drug use; gain the recommended amount of weight during pregnancy; and/or adequately address psychosocial problems such as homelessness, domestic violence or depression⁶. Figure 3 illustrates risk resolution rates for women who delivered in the Prenatal Plus Program during 2007. The program continues to experience high resolution rates in all five categories. Among women who were smokers when they began the program, 66 percent quit prior to delivery. This cessation rate is high when compared to the most recent data available for smoking cessation in the general population of pregnant women (50 percent)⁷. Seventy-two percent of those with weight-gain risk gained the recommended amount of weight. Of the women who reported psychosocial problems, 80 percent resolved their risk during pregnancy. A total of 92 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 Clients Who Delivered, 2007

The Prenatal Plus Program also assists women who have multiple risk factors, as illustrated in Figure 4. The percentages of women who resolve more than one risk factor are lower, as the challenge is more difficult. Among women with psychosocial and weight gain risks, 59 percent were able to resolve both by the end of pregnancy. For women who smoke in addition to demonstrating psychosocial and weight gain risks, 47 percent were able to resolve all three risks. Other combinations yielded resolution rates that were similar: 42 percent for those resolving smoking and weight gain, and 53 percent for those resolving smoking and psychosocial issues. Among all women delivering⁸, 61 percent were able to resolve *all* their risks, 25 percent were able to resolve some of their risks and only 14 percent were unable to resolve any of their risks.

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, 2006.

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



Figure 4: Risk Resolution Rates for Combinations of Risks Among Clients Who Delivered, 2007

Risk reduction was increased among women receiving model care. Ninety-one percent resolved all or some of their risks compared to 77 percent of those who did not receive model care, a difference that is statistically significant (p<.001). For each of the risk categories, those receiving model care were more likely to resolve these risks. For example, among smokers receiving model care, 57 percent quit compared to 47 percent of smokers quitting who did not get model care.

LOW BIRTHWEIGHT

The low birthweight rate in the United States has been increasing steadily, reaching a high in Colorado of 9.3 percent in 2005. Colorado's rate of 9 percent in 2006 and 2007 remains higher than the national rate. Conversely, the low birthweight rate among Prenatal Plus participants has declined in recent years to 10.7 percent in 2007, from a high of 12.6 percent in 2005.

This rate of 10.7 is 22.5 percent lower than what might normally be expected from this high-risk population, a rate of 13.8 percent. The "expected" rate is based on outcomes for women on Medicaid with similar risks who did not receive Prenatal Plus services. Of the 1,480 infants born to Prenatal Plus participants, only 159 weighed 5 pounds, 8 ounces or less. Without Prenatal Plus services, these women would have been expected to deliver 204 low birthweight infants, a difference of 45 low birthweight births in 2007. Since the Prenatal Plus Program began in 1996, an estimated 920 infants of clients have been born at normal weight. Without Prenatal Plus services, these infants might have been born at low birthweight.

Figure 5 demonstrates differences in low birthweight births among women who resolved individual or multiple risks and women who did not resolve those risks. As demonstrated below, nearly all of these differences achieved statistical significance. For women who quit smoking during pregnancy, the low birthweight rate was 10.6 percent versus 15.5 percent among those who continued to smoke. Among women who resolved psychosocial risk, the low birthweight rate was 10.1 percent; among those unable to resolve this risk, the low birthweight rate was 16.9 percent. When Prenatal Plus Program participants who were able to resolve all their risks are grouped together, regardless of the number of risks⁹, the low birthweight rate was 7.2 percent. By contrast, Prenatal Plus women who did not resolve any of their risks had a significantly higher low birthweight rate of 16.1 percent. Achieving risk resolution appears to result in fewer low birthweight infants.



Figure 5 : Low Birthweight Rates for Prenatal Plus Clients Unresolved Risks vs. Resolved Risks, 2007 Deliveries

COST SAVINGS TO MEDICAID, 2007

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.¹⁰ 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 \$1,424.¹¹

⁹ 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.

¹⁰ Complete cost study report available at <u>http://www.cdphe.state.co.us/pp/womens/PrenatalPlus.html</u>.

¹¹ Adjusted for 2007 costs using Bureau of Labor Statistics Data; Consumer Price Index: Medical care <u>http://www.bls.gov/cpi/home.htm</u>

Costs for low birthweight infants are five to nine times higher than for normal weight infants, given their need for extensive medical services. In 2007, the Prenatal Plus Program saved Medicaid an estimated \$2.7 million in health care costs for the 1,893 women who received Prenatal Plus services and their infants through their first year of life. However, focusing only on the short-term 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 are significantly compromised throughout the lifespan.

SUMMARY

In 2007, Prenatal Plus Program participants experienced a decrease in the rate of low birthweight infants from the expected rate of 13.8 percent to a rate of 10.7 percent. In addition, the significant differences in low weight births among women who resolved individual or multiple risks and those who did not underscores the importance of risk resolution in reducing low birthweight. The vast majorities of women in the program were able to resolve all or some of their risk factors, and consequently demonstrated improved birth outcomes. For those women able to resolve all their risks, the low birthweight rate for their infants was 7.2 percent, lower than the rate for all infants in Colorado.

Model care increases the proportion of women who are able to resolve their risks. Ninety-one percent resolved all or some of their risks compared to 77 percent of those without model care, a statistically significant difference. During the past five years, the program has demonstrated an increase in the percentage of women who are receiving model care, from 38 to 63 percent.

Infants weighing less than 5 pounds, 8 ounces at birth are more likely to experience costly medical interventions and health problems throughout the lifespan. The Prenatal Plus program provides substantial costs savings (\$2.7 million) to Medicaid, not including those costs that have not been quantified beyond the first year of life.

The Prenatal Plus Program will continue to develop strategies for increasing both client and provider participation in the program. However, reimbursement is a barrier to increasing the number of agencies providing Prenatal Plus and is most frequently cited as the main reason for service discontinuation.

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 12 years, the program has demonstrated a substantial reduction in low weight births among program participants. Continuing to offer these services to the high-risk Medicaid population is essential to reducing the state's low birthweight rate.

Appendix

Prenatal Plus Program Providers, 2007	13
Prenatal Plus Program Site Map, 2007	14
RISK DEFINITIONS	15
TABLE 1: CHARACTERISTICS AND INITIAL RISK FACTORS	16
TABLE 2: LOW BIRTHWEIGHT RATES - RISK RESOLVED VS. UNRESOLVED	17

Prenatal Plus Program Providers, 2007

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 Community Health Center: Pueblo Salud New Horizons Teen Clinic: Brighton San Juan Basin Health Department: Durango and Pagosa Springs Summit County Nursing Service: Frisco Teller County Public Health: Woodland Park Tri-County Health Department: Aurora, Englewood and Northglenn





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 drugs, 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 fewer than two pounds per month in the second or third trimester.

Risk Resolution: A client stops the risk behavior by quitting smoking, quitting drinking, quitting drug use, gaining an adequate amount of weight during pregnancy and/or improving 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, 2005-2007

Characteristic/ Initial Risk Factor	Percent of Prenatal Plus Clients with Characteristic or Initial Risk Factor			Percent of All Women Giving Birth in Colorado†
	2005 n=2,354	2006 n=2,137	2007 n=1,893	2007 n=70,804
Smoking	56	60	56	10*
Alcohol Use	43	45	53	11*
Drug Use	22	27	29	n.a.
Teenager (19 or younger)	32	32	32	10*
Not Married	81	85	84	28▲
Education Fewer Than 12 Years	43	41	39	21▲
Unintended Pregnancy	66	66	65	40*
Weight Gain Risk	45	45	46	27*
Psychosocial Risk	72	66	67	n.a.
Psychosocial and Weight Gain Risk	34	32	32	n.a.
Smoking and Weight Gain Risk	23	27	25	n.a.
Smoking and Psychosocial Risk	42	41	39	n.a.

† Statewide comparison values are based on the most recent data available from the Pregnancy Risk Assessment Monitoring System (PRAMS), 2006 and the 2006 Colorado birth certificate data. * PRAMS, 2006

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Colorado birth certificate data, 2006

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

Table 2Low Birthweight Rates AmongPrenatal Plus Program Clients Who Delivered:Risk/s Resolved vs. Risk/s Unresolved, 2007¹²

	Low birthwe		
Risk Factors	Risk/s Resolved	Risk/s Unresolved*	P**
Smoking	10.6	15.5	0.05
Psychosocial	10.1	16.9	0.01
Weight Gain	8.7	20.7	0.001
Psychosocial and Weight Gain	7.6	28.2	0.001
Smoking and Weight Gain	10.1	36.1	0.001
Smoking and Psychosocial	10.7	16.0	ns
Weight Gain, Psychosocial and Smoking	8.5	37.5	0.001
All Risks Resolved vs. None Resolved	7.2	16.1	0.001

* Unresolved includes women who were unable to resolve the specified risk or combination of risks during pregnancy.
** Chi-square tests comparing the low birthweight rates for clients who resolved risk/s 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 .05 means there is less than a 1/20 likelihood that the results happened by chance. The note of 'ns' means the difference did not achieve statistical significance.

¹² 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.