Prenatal Plus Program

2008 Annual Report

Colorado Department of Public Health and Environment

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

Prenatal Plus Program
2008 Annual Report
Executive Summary

Low birth weight 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 birth weight. 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.

Low Birth Weight
5 pounds, 8 ounces or less at birth
(Fewer than 2,500 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 2008, the low birthweight rate for infants born to Prenatal Plus participants who remained in the program through delivery was 9.4 percent. Six out of 10 (59 percent) Prenatal Plus Program participants were able to resolve **all** of their risks, and the resulting low birthweight rate for their infants was 8.4 percent. Compared to the low birthweight rate for Colorado in 2008 of 8.9 percent, this is an important achievement.

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, 65 percent quit before they delivered. Of the women who reported psychosocial problems, 76 percent resolved their risk during pregnancy. For women with inadequate weight gain during pregnancy, 71 percent gained the recommended amount of weight before delivery. A total of 92 percent of the women who reported using drugs quit, and 98 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. Eighty-eight 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 remained high at 63 percent in 2008.

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 with the Prenatal Plus staff.

Only about 17 percent (1,725) of the women who are eligible for Prenatal Plus services in Colorado are receiving them. An additional 8,600 Medicaid-eligible women out of a total of 16,600 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.

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INTRODUCTION

Low birth weight[1] 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[2] in Colorado, the Prenatal Plus Program addresses the behavioral, nutritional and psychosocial risks that contribute to low birth weight, 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 birth weight. This report summarizes the results of the Prenatal Plus Program during 2008.

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 problems that may increase the risk of delivering a low birthweight infant. 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.

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[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 2008, 1,725 women were enrolled in the Prenatal Plus Program statewide. A total of 1,338 mothers completed the program, delivering 1,347 infants (seven women had twins and one had triplets). Three hundred eighty-seven women withdrew from the program prior to delivery. Of those who withdrew, 17 transferred care to other providers, 77 moved, 121 could not be located despite follow-up, 42 experienced miscarriages or fetal deaths, 101 declined further care, two were denied Medicaid, 13 were withdrawn because their Prenatal Plus Program ended and 14 discontinued for unknown reasons.

In 2008, nine out of 10 (89.2 percent) women qualifying for the program met one or more of the six key enrollment criteria[3]: history of low birth weight, 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 large number of women meeting one or more of these enrollment criteria demonstrates that the program is effectively serving the population at the highest risk of delivering a low birthweight infant. The other 10.8 percent of women enrolled in the program met a minimum of three additional risks that in combination can 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-one agencies provided Prenatal Plus services in 22 counties in Colorado in 2008. One Prenatal Plus agency, Salud New Horizons Teen Clinic Brighton, chose to discontinue Prenatal Plus services during 2008 due to restructuring of services. A list and map of the 2008 program sites are located in the Appendix.

Only about 17 percent (1,725) of the women who are eligible for Prenatal Plus services in Colorado are receiving them. Out of 70,028 total births to Colorado residents in 2008, Medicaid paid for delivery for an estimated 24,000 women. According to a recent analysis by the Department of Health Care Policy and Financing, an estimated 7,400 of these deliveries were for women with the Emergency Medicaid eligibility type, which does not cover prenatal care services. Therefore, an estimated 16,600 had prenatal care paid for by Medicaid. Six out of every 10 (62 percent) Medicaid-eligible pregnant women, a total of approximately 10,300, have risks that would qualify them for the Prenatal Plus Program.[5] Therefore, there are nearly an additional 8,600 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.

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[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 http://www.cdphe.state.co.us/pp/womens/PNPlusManual/IntakeForm.pdf

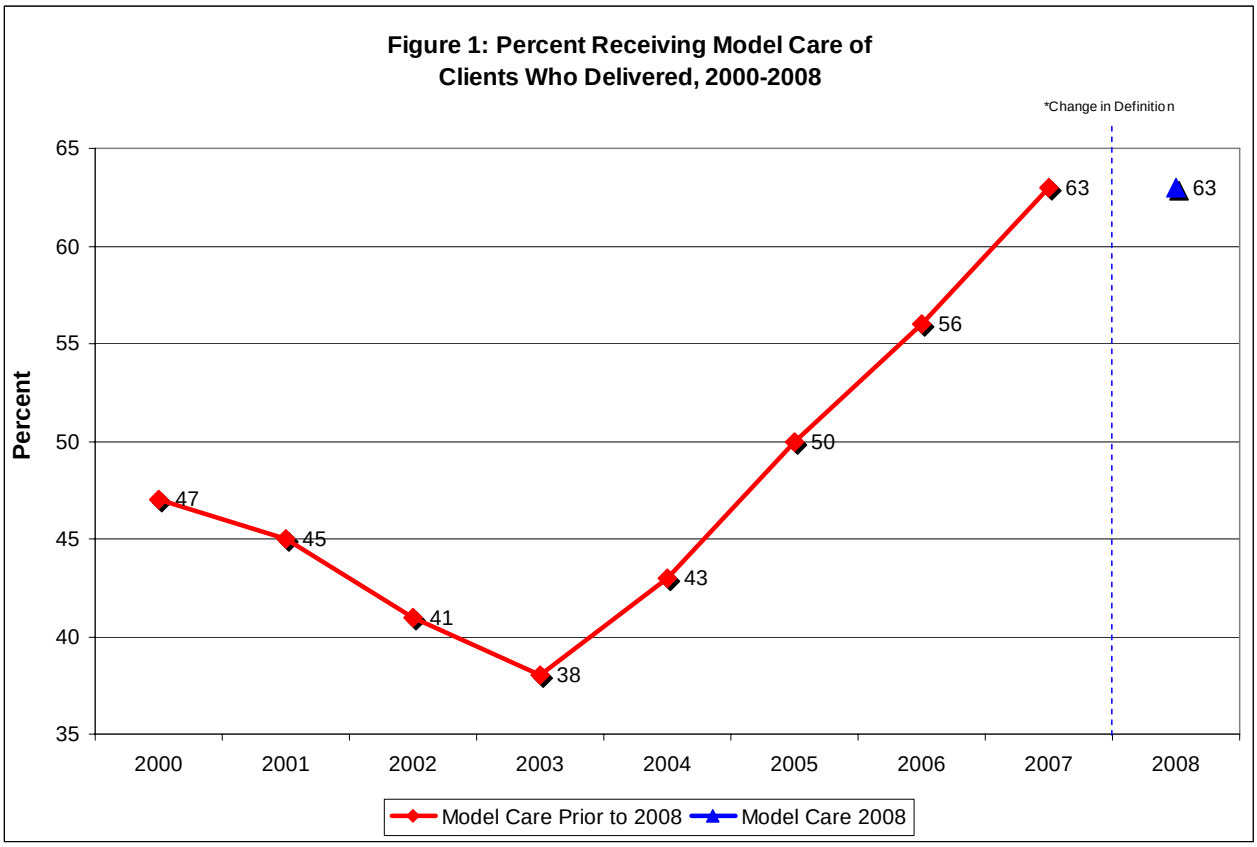
[5] Pregnancy Risk Assessment Monitoring System (PRAMS) data, 2004-2007.

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. In 2008, 88 percent of women enrolled in the program during the first or second trimester, and more than three-quarters (78 percent) received services through delivery. In order to meet the model care standard, the client must receive a minimum of 10 encounters with Prenatal Plus staff members. This model of care is based on program data, which indicate that this number of visits produces the best health outcomes for pregnant women and their infants, because more women resolve their risks. During 2008 the definition of model care changed to 10 total visits and the requirement to complete two home visits was eliminated.

Since 2003, the program has experienced a significant increase in the percentage of women receiving model care, which remained at a high of 63 percent for 2008 (Figure 1). This trend corresponds to an increase in reimbursement rates for model care, which may have resulted in an increased number of women receiving such care.

Figure 1: Percent Receiving Model Care of Clients Who Delivered, 2000-2008

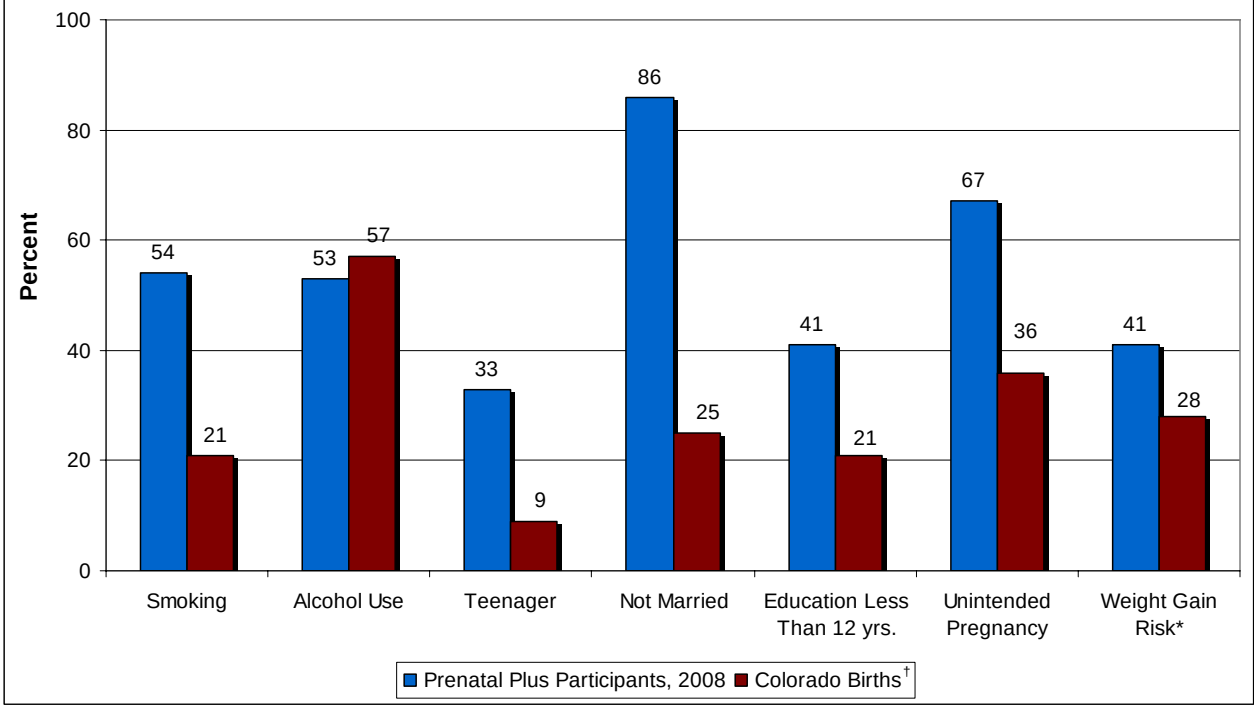


Model care prior to January 1, 2008 included 10 encounters with a client, 2 of which had to be home visits. As of January 1, 2008 model care is defined as 10 total encounters, regardless of the location of the visit.

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 in the Appendix for more detailed comparison data.

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



* Weight gain risk for Prenatal Plus participants includes 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. Weight gain risk for Colorado includes only women with inadequate prenatal weight gain.

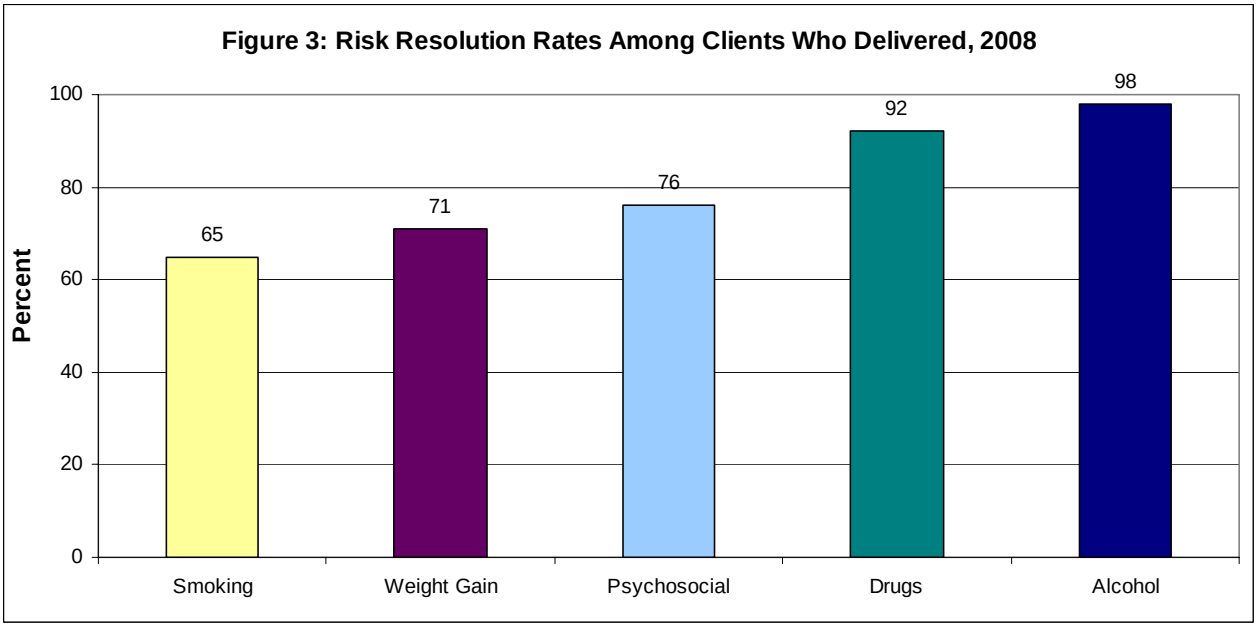
† Statewide comparison values are based on the most recent data available from the Pregnancy Risk Assessment Monitoring System (PRAMS), 2007 (smoking, alcohol use, unintended pregnancy and weight gain risk) and the 2008 Colorado birth certificate data (teenager, not married and education less than 12 yrs.).

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

depression[6]. Figure 3 illustrates risk resolution rates for women who delivered in the Prenatal Plus Program during 2008. Women in the program continue to experience high resolution rates in all five categories. Among women who were smokers when they began the program, 65 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 (47 percent) or the Medicaid population (42 percent)[7]. Seventy-one percent of those with weight-gain risk gained the recommended amount of weight. Of the women who reported psychosocial problems, 76 percent resolved their risk during pregnancy. A total of 92 percent of the women who reported using drugs quit, and 98 percent of the women who reported alcohol use stopped drinking during pregnancy.

Figure 3: Risk Resolution Rates Among Clients Who Delivered, 2008

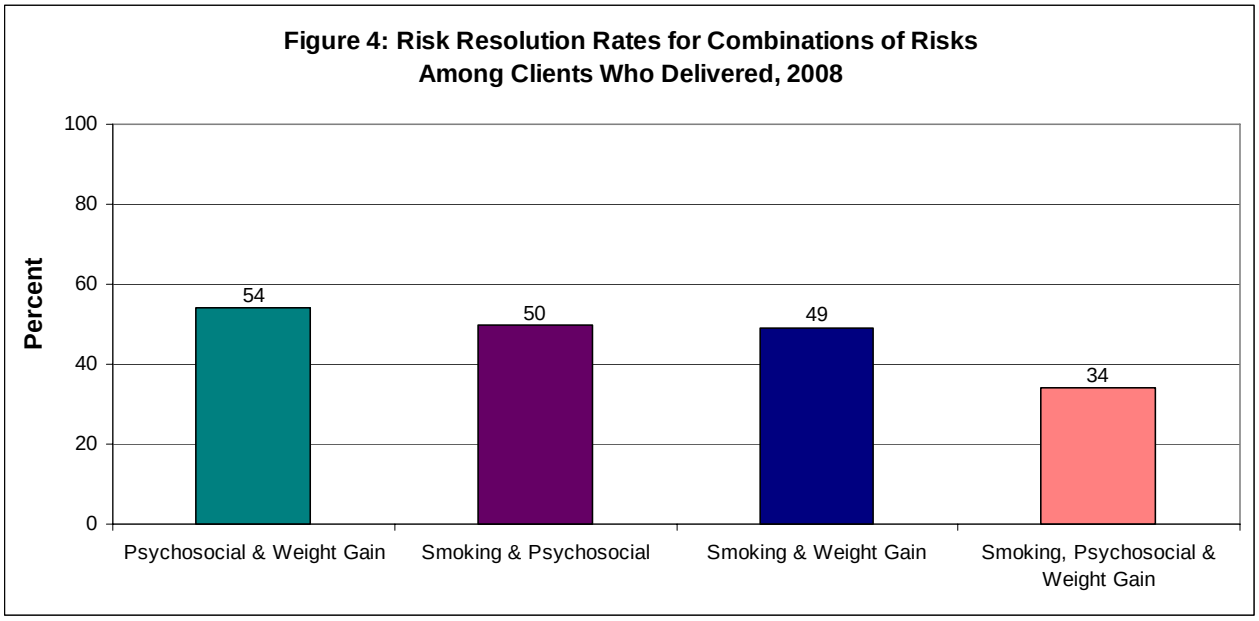


The Prenatal Plus Program also assists women who have multiple risk factors, as illustrated in Figure 4. The percentages of women who resolve more than one risk factor are lower, as the challenge is more difficult. Among women with psychosocial and weight gain risks, 54 percent were able to resolve both by the end of pregnancy. Other combinations yielded resolution rates that were similar: 49 percent for those resolving smoking and weight gain, and 50 percent for those resolving smoking and psychosocial issues. For women who smoke in addition to demonstrating psychosocial and weight gain risks, 34 percent were able to resolve all three risks. Among all women delivering[8], 59 percent were able to resolve *all* their risks, 26 percent were able to resolve some of their risks and only 15 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, 2007

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



Risk reduction was increased among women receiving model care. Eighty-eight 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, 69 percent quit compared to 59 percent of smokers quitting who did not get model care.

LOW BIRTHWEIGHT RATE

The low birthweight rate in the United States has been increasing steadily. Although Colorado's rate remains higher than the national rate, it has not increased since 2005 and actually declined from 9.0 percent in 2007 to 8.9 percent in 2008. Moreover, the low birthweight rate among Prenatal Plus participants declined in recent years to 9.4 percent in 2008, from a high of 12.6 percent in 2005 (Figure 5).

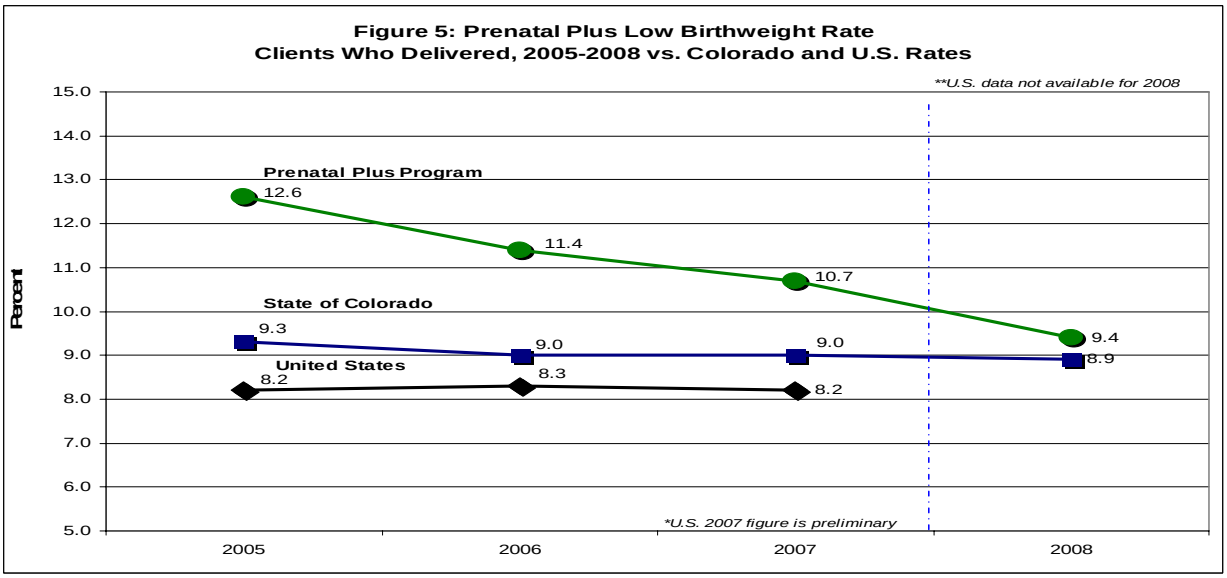
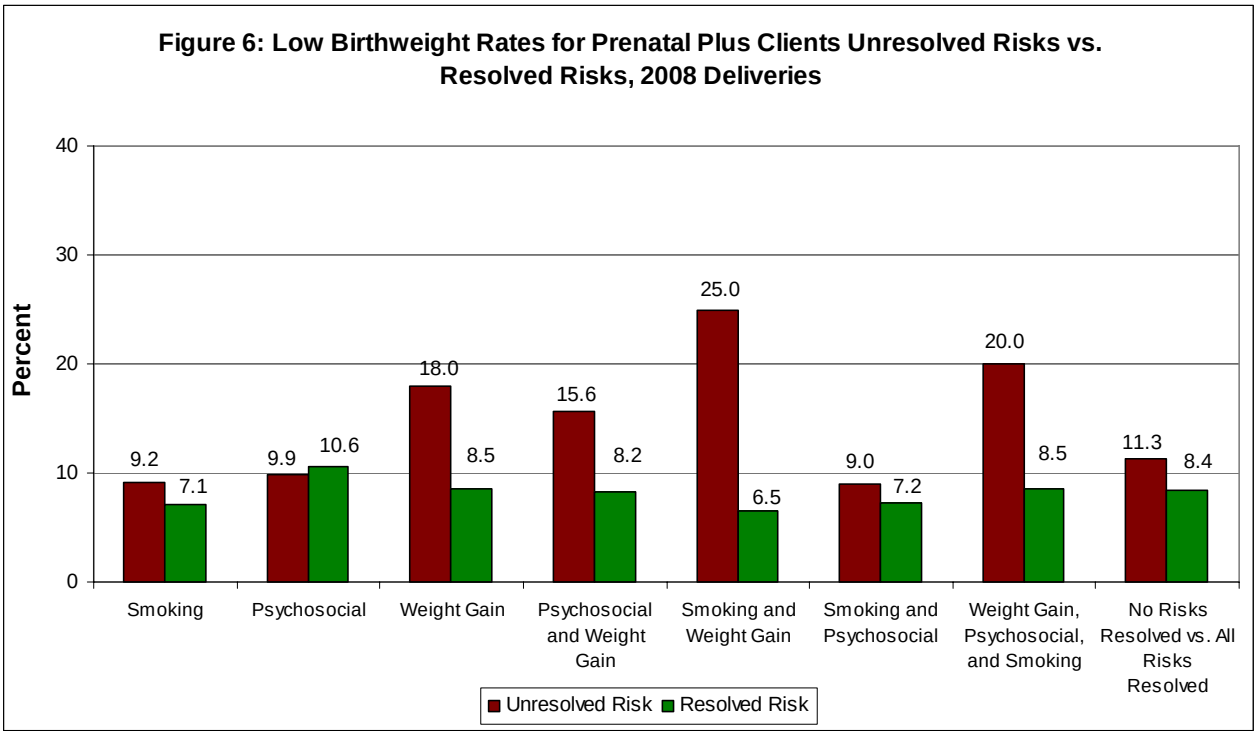


Figure 6 demonstrates differences in low birthweight births among women who resolved individual or multiple risks and women who did not resolve those risks. As shown in the figure and in Table 2, all but one of these differences were in the desired direction and some achieved statistical significance. Resolution of psychosocial risk was the only factor that, as a single risk, did not yield a result in the desired direction, although the difference between the low birthweight rates for this risk was not statistically significant.

For women who quit smoking during pregnancy, the low birthweight rate was 7.1 percent versus 9.2 percent among those who continued to smoke. Among women who resolved weight gain risk, the low birthweight rate was 8.5 percent; among those unable to resolve this risk, the low birthweight rate was 18.0 percent. When Prenatal Plus Program participants who were able to resolve all their risks are grouped together, regardless of the number of risks[9], the low birthweight rate was 8.4 percent. By contrast, Prenatal Plus women who did not resolve any of their risks had a significantly higher low birthweight rate of 11.3 percent. Achieving risk resolution appears to result in fewer low birthweight infants.

Figure 6: Low Birthweight Rates for Prenatal Plus Clients Unresolved Risks vs. Resolved Risks, 2008 Deliveries



COST SAVINGS TO MEDICAID, 2008

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

[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.

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 are saved in Medicaid costs annually. For each infant born, the savings are estimated at $1,450.[11] Costs for low birthweight infants are five to nine times higher than for normal weight infants, given their need for extensive medical services. In 2008, the Prenatal Plus Program saved Medicaid an estimated $2.5 million in health care costs for the 1,725 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 birth weight, since the health and quality of life for low birthweight infants often are significantly compromised throughout the lifespan.

SUMMARY

In 2008, Prenatal Plus Program participants experienced a decrease in the rate of low birthweight infants to a rate of 9.4 percent. In addition, the 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 birth weight. 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 8.4 percent, lower than the rate for all infants in Colorado.

Model care increases the proportion of women who are able to resolve their risks. Eighty – eight percent resolved all or some of their risks compared to 77 percent of those without model care, a statistically significant difference. During the past six 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 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 birth weight 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 13 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.

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

[11] Adjusted for 2008 costs using Bureau of Labor Statistics Data; Consumer Price Index: Medical care http://www.bls.gov/cpi/home.htm.

Appendix

Prenatal Plus Program Providers, 2008

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

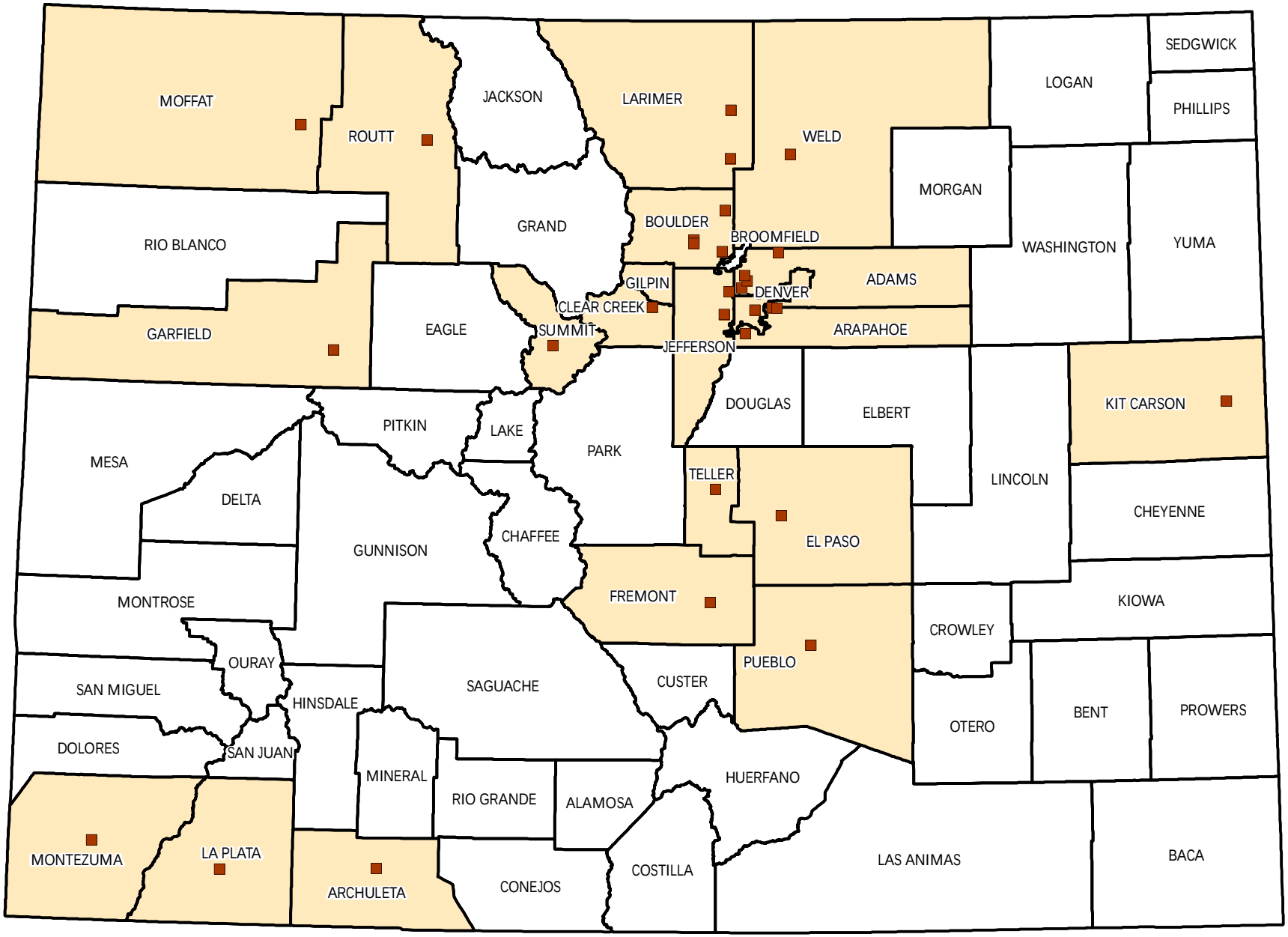
Salud New Horizons Teen Clinic: Brighton

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



Prenatal Plus Sites
Colorado, 2008

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, 2006-2008

Characteristic/ Initial Risk Factor	Percent of Prenatal Plus Clients with Characteristic or Initial Risk Factor			Percent of All Women Giving Birth in Colorado†
	2006 n=2,137	2007 n=1,893	2008 n=1,725	2008 n=70,028
Smoking	60	56	54	21*
Alcohol Use	45	53	53	57*
Drug Use	27	29	27	n.a.
Teenager (19 or younger)	32	32	33	9▲
Not Married	85	84	86	25▲
Education Fewer Than 12 Years	41	39	41	21▲
Unintended Pregnancy	66	65	67	36*
Weight Gain Risk	45	46	41	28*
Psychosocial Risk	66	67	67	n.a.
Psychosocial and Weight Gain Risk	32	32	28	n.a.
Smoking and Weight Gain Risk	27	25	21	n.a.
Smoking and Psychosocial Risk	41	39	39	n.a.

† Statewide comparison values are based on the most recent data available from the Pregnancy Risk Assessment Monitoring System (PRAMS), 2007 and the 2008 Colorado birth certificate data.

* PRAMS, 2007

▲ Colorado birth certificate data, 2008

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/s Resolved vs. Risk/s Unresolved, 2008[12]

Risk Factors	Low birthweight Rates (%)		P**
	Risk/s Resolved	Risk/s Unresolved*	
Smoking	7.1	9.2	ns
Psychosocial	10.6	9.9	ns
Weight Gain	8.5	18.0	0.01
Psychosocial and Weight Gain	8.2	15.6	ns
Smoking and Weight Gain	6.5	25.0	0.01
Smoking and Psychosocial	7.2	9.0	ns
Weight Gain, Psychosocial and Smoking	8.5	20.0	ns
All Risks Resolved vs. None Resolved	8.4	11.3	0.1

* 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 0.01 means there is less than a 1/100 likelihood that the results happened by chance. A value of 0.1 means there is less than a 1/10 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.