

The Health Status of Colorado's Maternal and Child Health Population

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Foreword

The Health Status of Colorado's Maternal and Child Health Population is a Colorado Department of Public Health and Environment report describing the health and well-being of infants, children, adolescents, women, and children with special health care needs in Colorado. The report is organized by topic area and includes chapters on pregnancy and prenatal care; infant health; child health; adolescent health; children and youth with special health care needs; oral health; and access to health care. A broad range of data is used to provide an in-depth look at the health of these populations in the state. Data sources include U.S. Census data, birth and death certificate data, Pregnancy Risk Assessment Monitoring System (PRAMS) data, Behavioral Risk Factor Surveillance System (BRFSS) data, Oral Health Surveillance data, Child Health Survey data, Youth Risk Behavior Survey (YRBS) data, and State and Local Area Integrated Telephone Survey (SLAITS) data.

While the Health Status Report was originally prepared as the quantitative assessment of need for the federal Maternal and Child Health Block Grant Application for FY 2006, it is also a stand-alone document that provides public health professionals, partners, community members, and the general public with a report on the health of the maternal and child health population in Colorado. Further information about the Maternal and Child Health population can be accessed from the state's Maternal and Child Health's Web site at www.cdphe.state.co.us/ps/mch/mchhom.asp.

Acknowledgements

The Health Status of Colorado's Maternal and Child Health Population was researched and written by Marilyn Leff, MSW, MSPH, and edited by Sue Ricketts, Ph.D., and Darci Cherry, MPH. Ms Leff is the former Director of the Health Statistics Section at the Colorado Department of Public Health and Environment. Dr. Ricketts is the MCH Demographer and Ms. Cherry is the MCH Statistical Analyst with the Office of Maternal and Child Health at the Colorado Department of Public Health and Environment.

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Overview of the State

The Rocky Mountain state of Colorado is bounded on the east by Kansas and Nebraska, on the north by Nebraska and Wyoming, on the west by Utah and on the south by New Mexico and Oklahoma. The boundary lines create an almost perfect rectangle, measuring 387 miles from east to west and 276 miles from north to south, and covering 104,247 square miles. Colorado is the eighth largest state geographically, and consists of a variety of mountains, plateaus, canyons and plains. The eastern half of the state has flat, high plains and rolling prairies that gradually rise westward to the front range foothills and the higher ranges of the Rocky Mountains. The Continental Divide runs from north to south through west central Colorado and bisects the state into eastern and western slopes. The western half of the state consists of alpine terrain interspersed with wide valleys, rugged canyons, high plateaus and deep basins. (1)

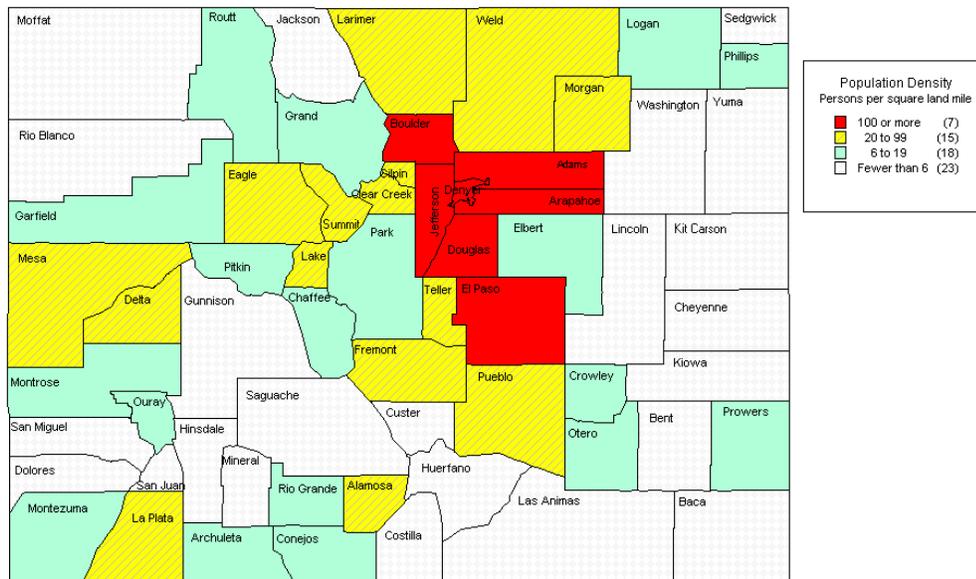
The state can be divided into five distinctive regions: the Front Range, the Western Slope, the Eastern plains, the Eastern mountains, and the San Luis Valley. Each of these areas has grown in population, ranging from a 15 percent increase in the San Luis Valley from 1990 through 2000 to a 38 percent increase on the Western Slope. Close to 82 percent of the population lives in the Front Range, which includes the metropolitan areas of Denver-Boulder, Ft. Collins, Greeley, Colorado Springs, and Pueblo. The San Luis Valley in the southern part of the state is the region with the smallest population, with about 46,000 residents. Over fifteen percent of Colorado residents are considered rural residents, living outside core urban areas and areas adjacent to an urban core. Yet, close to 40 percent of these rural residents live in the urbanized Front Range counties. (2) The rural vastness of much of the state is confirmed by 23 of Colorado's 63 counties in the 2000 Census qualifying as "frontier counties," containing fewer than 6 persons per square mile. The mountain range separating the populated Front Range from the more rural areas of the Western Slope, Eastern Mountains, and San Luis Valley makes the delivery of health care more difficult to those in these rural areas. Map 1 shows the counties within Colorado by their population density. (3).

In 2001, one additional county was added to the existing 63: Broomfield County, consisting of areas formerly in the urban counties of Adams, Boulder, Jefferson, and Weld. Each of the 64 counties within Colorado has its own local government. There are 15 organized health departments covering 24 counties. In addition, 39 county nursing services provide services to the remaining 40 counties.

Population

The 2000 Census enumerated the state's population at 4,301,261, an increase of over 31 percent since the 1990 Census. The population increased by another 166,739 people by 2005, growing by 4 percent between 2000 and 2005. (4) The average annual increase in population between 1990 and 2000 was 2.7 percent, and between 2000 and 2005, it was just under 1 percent. Even with the decline in the rate of population growth, Colorado is ranked 5th in the country in percentage growth since the 2000 Census.

Map 1. County Population Density, 2000



The two major racial and ethnic groups in Colorado are White non-Hispanic and Hispanic. In the 2000 Census, 74.5 percent of the population identified themselves as White non-Hispanic, 17.1 percent identified themselves as Hispanic, and 8.4 percent identified themselves as not Hispanic and not White. Among all racial groups (not considering Hispanic ethnicity which is generally included under White), 82.9 percent of the population was White; 3.8 percent was African-American or Black; 2.2 percent was Asian; 1.0 percent was American Indian; 0.1 percent was Native Hawaiian or Pacific Islander; 7.2 percent was some other race; and 2.8 percent were persons belonging to two or more racial groups. The increase in the Hispanic population statewide between 1990 and 2000 amounted to 311,299, rising from 424,302 at the beginning of the decade. Much of the increase in the Hispanic population is made up of United States citizens and immigrants who are in the United States legally; some substantial but unknown amount of growth consists of undocumented workers and their families who are not legal residents.

The total number of births in Colorado has increased rapidly in recent years. In 1990 there were about 53,000 births annually. By 1998 the number had grown to nearly 60,000. In 2003, the number reached 69,304. The number of deaths has changed as well over this time period. In 1990 there were 21,514 deaths; in 1995, just under 25,000. In 2003, the number rose to 29,410. It is important to note as well that migration has been an important factor in the state's population growth in recent years. Between 1990 and 2000 the total number of people moving to the state, less the number leaving, exceeded 700,000. Between 2000 and 2003, net migration is estimated to have added an additional 144,000 residents.

According to the 2002 American Community Survey, the Census Bureau's most up-to-date survey, 17 percent of children age 5 to 17 and 15 percent of adults 18 and older spoke a language other than English. (5) For both children and adults, Spanish was the main other language spoken with 13 percent of school aged children able to speak Spanish and 11 percent of adults. The survey estimated that from 3 to 5 percent of households in Colorado were linguistically isolated, i.e., that all members 14 years and older have at least some difficulty with English.

Estimates by the Colorado Department of Local Affairs suggest that almost 21 percent of the population in 2005 (992,490) will be women of reproductive age (15-44). Approximately 29 percent or 1.3 million will be children 19 and younger. The number of women of reproductive ages is projected to grow by over 10 percent in the next ten years to close to 1.1 million; the number of children in the state is projected to grow by over 15 percent in that same time period to close to 1.5 million. (6) Table 1 shows the age distribution of the Colorado population projected for 2005.

Table 1: Colorado Population Projections by Age and Sex, 2005

Age Group	Total	Males	Females
0-4	340,906	174,639	166,268
5-9	314,118	160,887	153,231
10-14	319,324	163,604	155,720
15-19	344,030	177,083	166,947
20-24	341,330	179,485	161,844
25-29	305,552	159,284	146,268
30-34	348,676	182,598	166,078
35-39	346,603	179,272	167,331
40-44	372,002	187,980	184,022
45+	1,614,780	775,930	838,850
Total	4,647,321	2,340,762	2,306,559

Economy

While Colorado saw record low unemployment in 2000, the economy took a downturn in 2001, but has shown some improvement since 2003. Colorado's economy has been based on employment in the service-based industries for more than six decades, which provide over 85 percent of jobs. The service-based industries cover a wide range of businesses that do not produce tangible goods and include professional, scientific, technical, managerial, administrative, educational, health care and social assistance, and accommodation and food services. Thus, within this employment sector there are a wide range of skills. Three of the top five largest employers in the state are retailers.

With the influx of population, Colorado has seen an increase of over 42 percent in employment growth from 1990 through 2003 making it the 5th highest state in employment growth during that time, much higher than the national average of 19 percent. However, as with all other areas of the country, Colorado experienced a downturn in employment after 2000. Over 95,000 jobs were lost from 2001 to 2003. Yet

there appears to be some job growth since that time with 22,700 new jobs created from July 2003 through July 2004. The July 2004 unemployment rate stands at 5.1 percent, compared to 6.1 percent in July 2003 and a record low of 2.7 percent in 2000. (8)

In 2002, 9 to 10 percent of the population in Colorado was estimated to be living below the poverty level; 12 percent of children 0 to 17 and 16 percent of women of reproductive age (15-44) had incomes below the poverty level. The poverty rate for the state's largest minority population, those of Hispanic origin, was almost double the rate of the general population. The American Community Survey estimated that 16 to 24 percent of those identifying themselves as Hispanic or Latino were living below the poverty level in 2003. Eighteen to 28 percent of Hispanic children age 0 to 17 are estimated to live in households below the poverty level. While the survey did not estimate the poverty rate for women of reproductive age by race and ethnicity, the 2000 Census reported that 21 percent of all Hispanic women of reproductive age lived below the poverty level.

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Pregnancy and Prenatal Care

A variety of factors both before and during pregnancy greatly influence the health of the mother and her newborn. A healthy pregnancy with adequate prenatal care provides a basis for a healthy outcome. To better describe issues during pregnancy for women in Colorado, two sources of data were explored for this section: birth certificates and results of the Colorado Pregnancy Risk Assessment Monitoring System (PRAMS). Colorado PRAMS is an ongoing, population-based surveillance system conducted by the Colorado Department of Public Health and Environment, in collaboration with the Centers for Disease Control and Prevention. Each month the PRAMS questionnaire is mailed to a randomly selected sample of approximately 5 percent of all women in Colorado who delivered a live-born infant. Colorado PRAMS surveys were begun in 1997; data are currently available for each year through 2002.

In this section, and the sections to follow, the Healthy People 2010 objectives for the nation are used as benchmarks to measure how Colorado is progressing to meet these national health objectives. Developed in collaboration with many different parties and the best scientific evidence available, these objectives provide a systematic method for improving the health of populations. These objectives help us determine which health areas need to be strengthened in which populations in Colorado (1)

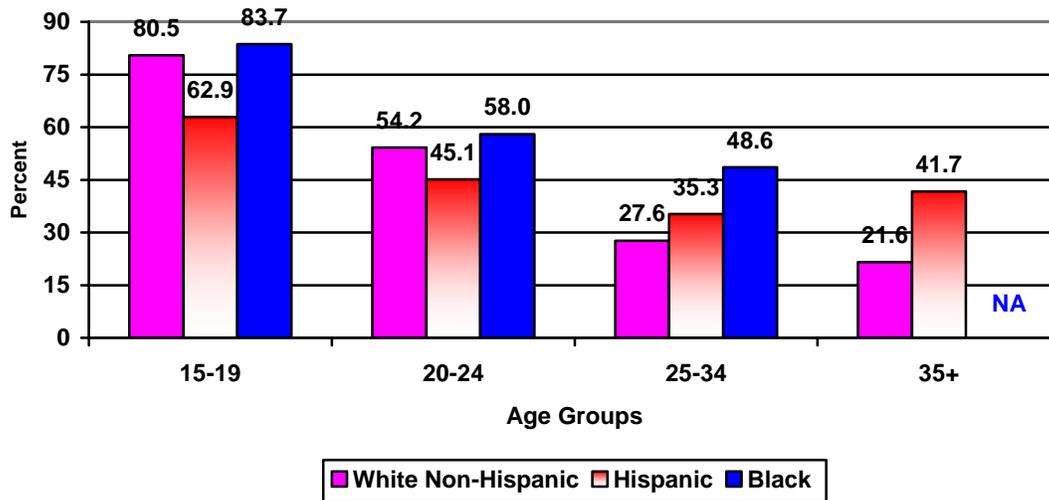
Unintended Pregnancy

Whether a pregnancy is planned or unintended is important to the health of the woman and her infant. Intention may influence a woman's behaviors which affect her health and the health of her newborn both during and after pregnancy. Unintended pregnancy is defined as one that occurs sooner than the woman wanted (mistimed) or one that was never wanted at all (unwanted). Studies have shown that women whose pregnancies are unintended are less likely to start prenatal care early and less likely to adopt healthy behaviors during a pregnancy. (2)

One of the goals of Healthy People 2010 is to reduce unintended pregnancies to no greater than 30 percent of all births. Approximately 39 percent of Colorado's live births were unintended in 2002. Based on results from Colorado PRAMS, this figure has remained constant, changing little between 1997 and 2002. During this same time period, over half of all live births to Medicaid recipients were unintended, ranging from 55 percent to 59 percent.

Data from Colorado PRAMS indicate that pregnancy intention varies a great deal by age. Among all race and ethnic groups, the percentage of unintended pregnancy decreases significantly as age increases. Figure 1 on the following page shows the percentage of pregnancies that were unintended by age for non-Hispanic White, Hispanic, and Black women during the period 1997-2002. Over 80 percent of births to non-Hispanic Whites and Blacks age 15 to 19 were unintended; this is significantly higher than the 63 percent of births to Hispanic women in the same age group.

Figure 1. Unintended Pregnancy among Women Having a Live Birth by Age and Race/Ethnicity of Mother, Five-Year Average, Colorado, 1998-2002



In the PRAMS surveys from 2000 through 2002, respondents were asked if they or their husband/partner were doing anything to keep from getting pregnant at the time they got pregnant. Of those who reported that their pregnancy was unintended, younger women were less likely to be doing anything to prevent a pregnancy than older women. Approximately 56 percent of women age 15 to 19 with unintended pregnancies reported “not doing anything” compared to 44 percent of those 35 and older. Among those who had an unintended pregnancy, the reasons women gave for not engaging in behaviors to avoid pregnancy varied by age. Table 2 shows the main reasons given by women with unintended pregnancies who responded that they failed “to do anything” to avoid pregnancy.

Table 2. Top Two Reasons for “Not Doing Anything” to Prevent Pregnancy Among Women Who Reported that Their Pregnancies Were Unintended, by Age, Three-Year Average, Colorado PRAMS, 2000-2002

	Percent
15-19 Years	
Thought I could not get pregnant	40.6
Husband/partner didn't want to use anything	26.1
20-24 Years	
Thought I could not get pregnant	33.1
Didn't mind getting pregnant	30.0
25-34 Years	
Didn't mind getting pregnant	39.0
Thought I could not get pregnant	37.8
35+ Years	
Thought I could not get pregnant	45.5
Didn't mind getting pregnant	37.8

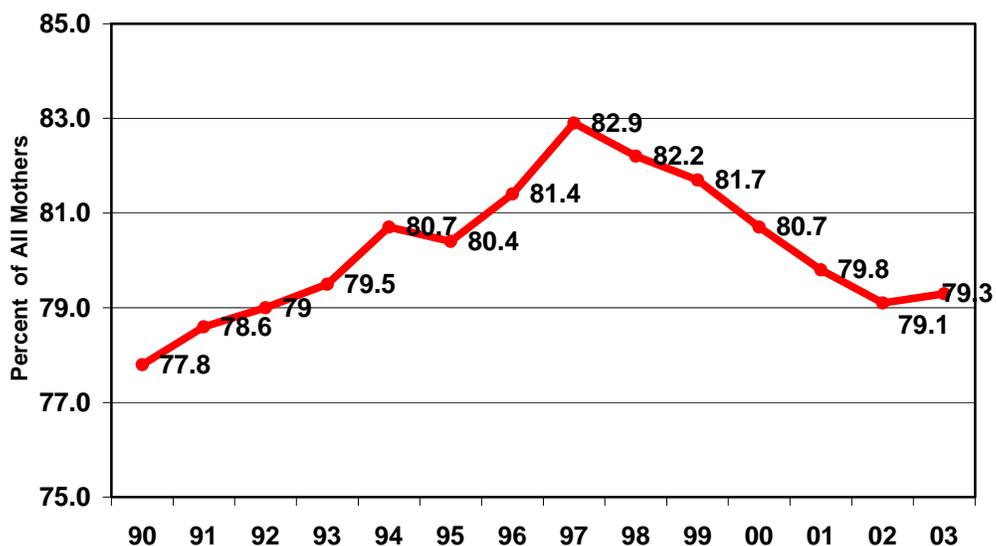
One of the major reasons for not doing anything to keep from getting pregnant among women with an unintended pregnancy was that they thought they could not get pregnant. Thinking that one cannot get pregnant indicates that more education is needed in community and clinical interventions. Public health providers need to better understand why women doubt that pregnancy is possible and target educational efforts accordingly. Over a quarter of mothers age 15 to 19 indicated that their husband/partner didn't want to use anything to keep from getting pregnant. This underscores the importance of addressing unintended pregnancy and its consequences with adolescent males as well as females.

Prenatal Care

Early and adequate prenatal care is vital to the health of both mother and infant. Prenatal care includes risk assessment, prevention and/or treatment for medical conditions, behavioral risk reduction, and education about a healthy pregnancy. Healthy People 2010 goals around prenatal care include increasing to 90 percent the proportion of women receiving prenatal care in the first trimester and also increasing to 90 percent the proportion of women receiving adequate care. Currently, adequacy of prenatal care is measured by the Kotelchuck Index, which combines information about prenatal care initiation, number of prenatal visits, and gestational age to determine the adequacy of prenatal care.

Colorado does not currently meet the Healthy People 2010 goal for first trimester enrollment. The percent of all live births to women who received prenatal care in the first trimester steadily slipped in five of the last six years, down from a high of 82.9 percent in 1997 to 79.3 percent in 2003. Colorado was ranked 44th among all states in 2002 in the percent of women receiving care in the first trimester, with a rate well below the national rate of 83.7 percent. (3)

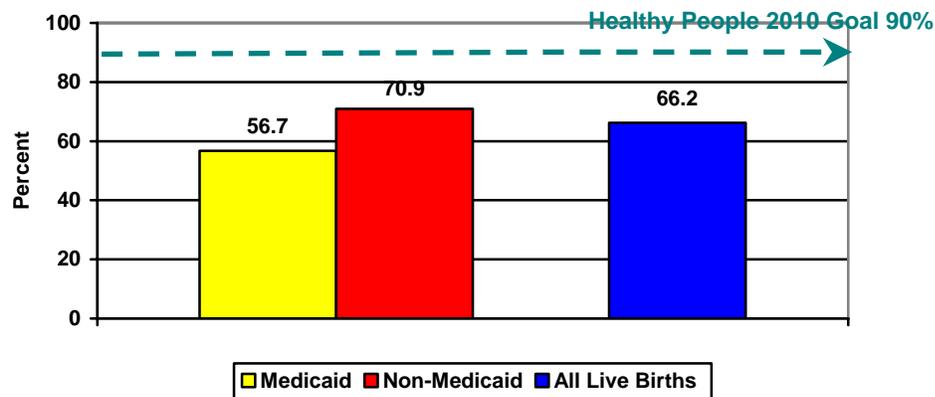
Figure 2. Percent of Births with First Trimester Care, Colorado Residents, 1990-2003



Birth certificate data for 2003 also demonstrate that the first trimester prenatal care rate varied by race/ethnicity—with White non-Hispanics having the highest rate (86.1 percent) followed by Blacks (70.9 percent) and then Hispanics (67.0 percent). No racial or ethnic group in Colorado is meeting the Healthy People 2010 goal of 90 percent, with the highest rates for each group obtained in the late 1990s. Access to early prenatal care is a critical health care issue for pregnant women.

The number of women receiving adequate prenatal care in Colorado has also declined in recent years. Based on PRAMS data, only 66.2 percent of Colorado women had adequate or better prenatal care in 2002 using the Kotelchuck Index. This percentage declined from a high of 70.8 percent in 1999. Women on Medicaid consistently receive less than adequate care compared to other Colorado women; in 2002, 56.7 percent of Medicaid recipients received adequate care compared to 70.9 percent of all other women. Figure 3 below shows these percentages in comparison to the Healthy People 2010 goal of 90 percent.

Figure 3. Percent of Live Births Whose Mothers Received Adequate Prenatal Care by Medicaid Status, Colorado PRAMS, 2002



Based on data from Colorado PRAMS 1998-2002, Hispanic women in all age groups were less likely to receive adequate prenatal care than their non-Hispanic White and Black counterparts. Table 3 on the following page gives the percentage of births with adequate prenatal care using the Kotelchuck index.

Hispanic women were the least likely to have received adequate prenatal care; the proportions were significantly less than those of non-Hispanic Whites in every age group. Following all women of Hispanic origin, Black women 20-24 and White non-Hispanic women 15-19 had the next lowest rates of adequate prenatal care. No group has reached the Healthy People 2010 goal.

Low adequacy of prenatal care rates for Hispanics are greatly influenced by the experience of women who are not U.S. citizens. Women who were not born in the United States and who are undocumented do not have access to public insurance

Table 3: Percent of Live Births Whose Mothers Received Adequate Prenatal Care by Race/Ethnicity and Age, Colorado PRAMS, 1998-2002

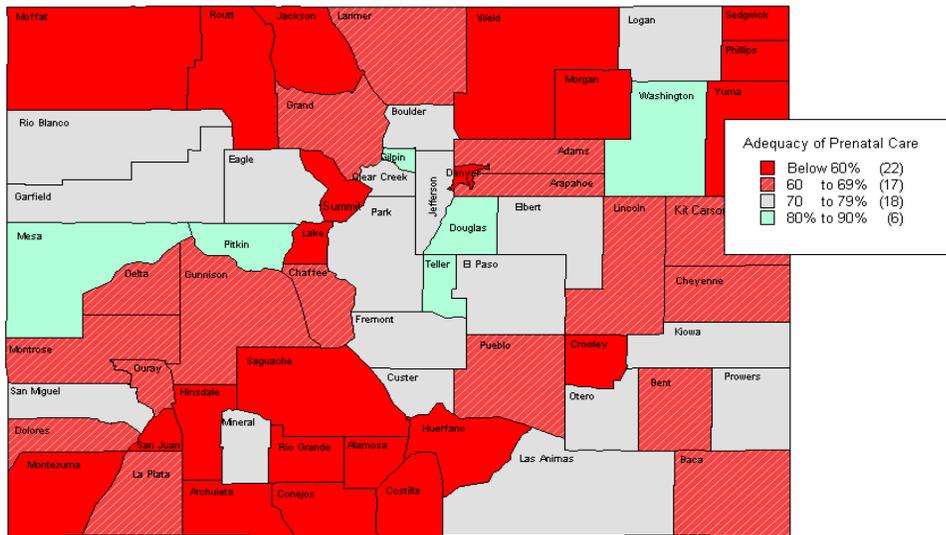
Age	Non-Hispanic		
	White	Hispanic	Black
15-19	63.9	52.3	73.1
20-24	72.7	54.4	57.9
25-35	76.6	58.7	71.0
35+	78.4	54.5	***
Total	75.2	55.7	67.9

***Cannot estimate due to too few births in the sample

programs like Medicaid to cover prenatal care. If they cannot obtain a payor source they may be unable to access regular prenatal care. Emergency Medicaid coverage is available only for labor and delivery. In 2002, more than half (54.6 percent) of all Hispanic births were to mothers who were born in Mexico or Central or South America. These figures have grown substantially since 1990 when the comparable figure was one in five (20.9 percent) Hispanic births.

The percent of women receiving adequate prenatal care also varies by county. Map 2 shows the percent of women who received adequate prenatal care by county of residence.

Map 2. Percent of Live Births Whose Mothers Received Adequate Prenatal Care by County of Residence, Colorado Residents, 2003



The percent of women receiving adequate prenatal care ranged from 35.3 percent in Costilla County to 87.3 percent in Pitkin County. While the Healthy People 2010 goal is for 90 percent of all women to have adequate prenatal care, one-third of all Colorado counties (22) had fewer than 60 percent of pregnant women receiving such care in 2003

(shown in dark red). Another 17 counties (lighter red) had between 60 and 69 percent receiving adequate care. Six counties (light green) had at least 80 percent receiving adequate care, but no county reached 90 percent.

Maternal Morbidity/Complications

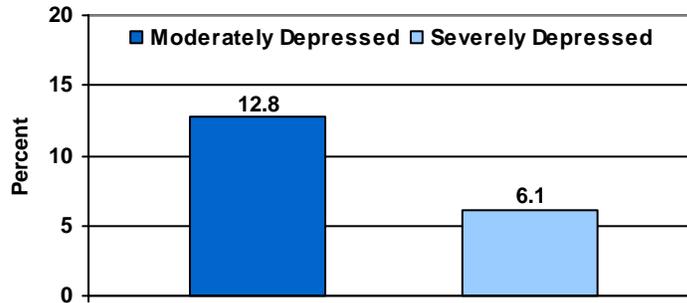
Colorado PRAMS data reveal that preterm labor (before 37 weeks gestation) was the medical problem experienced most by Colorado women during pregnancy. Close to 28 percent of women in 2002 reported that they had experienced premature labor during their pregnancy. This percentage has held constant over the last three years. However, in 2002 a higher proportion of women on Medicaid reported preterm labor (34 percent) compared to women not on Medicaid (25 percent).

Other major problems reported by mothers included nausea/dehydration (28 percent), high blood pressure (18 percent), vaginal bleeding (15 percent) and kidney/bladder infections (14 percent). The rate of these reported problems has held steady for all of Colorado in the last three years. A significantly larger proportion of women on Medicaid reported more nausea and dehydration (34 percent vs. 25 percent) and kidney/bladder infections (20 percent vs. 12 percent) than women not on Medicaid. The proportion of women on Medicaid reporting vaginal bleeding increased in the last 3 years; from 10 percent in 2000 to 17 percent in 2002.

Another issue that the Healthy People 2010 goals address is the proportion of women experiencing postpartum complications, including postpartum depression. In addition to directly influencing the emotional well-being of mothers, postpartum depression has been shown to affect marital relationships, mother-infant bonding, and infant behavior. (4) Postpartum depression was measured by Colorado PRAMS in 1998, 1999 and 2002 (data for 2002 are shown in Figure 4). During those years the percentage of mothers experiencing depression remained fairly constant, with no significant differences seen by year. During that time approximately 38 to 40 percent of women giving birth reported that they were not depressed at all, but a majority of women expressed some degree of depression. Between 10 and 13 percent were moderately depressed (after the birth of their baby), another 5 to 7 percent reported being very depressed, and 42 to 45 percent were slightly depressed. This is similar to data collected from seven states where rates of severe postpartum depression were between 5.1 and 8.9 percent. (4) Thus at a minimum, 15 percent of women in Colorado experience at least a moderate or more severe degree of postpartum depression. Data from earlier PRAMS surveys (1998, 1999) found that 1 out of 3 women (32 percent) responded that their health care provider had not talked with them about postpartum depression.

Physical abuse during pregnancy has been linked to postpartum depression. (4) An estimated 4 to 8 percent of women nationally experience physical abuse during pregnancy, suggesting that violence may be more common for pregnant women than preeclampsia or gestational diabetes, conditions for which screening during pregnancy is routine. (5) Colorado PRAMS data show that 3 to 4 percent of all women in Colorado report being physically abused during their pregnancy, and this percentage has held

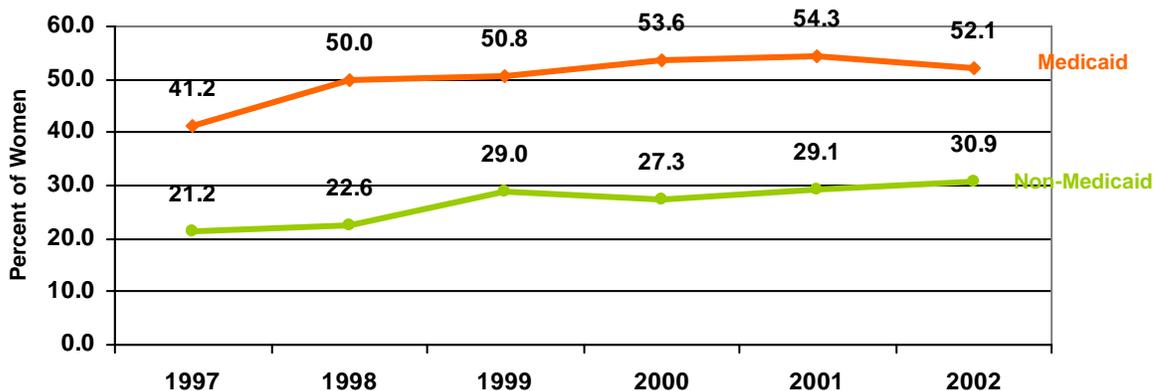
Figure 4. Percent of Mothers Experiencing Postpartum Depression by Severity of Depression, Colorado PRAMS, 2002



steady since 1997. Medicaid recipients are more likely to report being abused during pregnancy than non-Medicaid women. This is consistent with other surveys of low-income women receiving government assistance. (6) From 1997 to 2003, 7 to 8 percent of women receiving Medicaid reported being physically abused during their pregnancies, compared to 2 to 3 percent of other women.

The American College of Obstetrics and Gynecology has developed guidelines for violence screening and recommends routine screening of all women for domestic violence. (5) Given the likelihood that pregnant women will access care during pregnancy, health care workers providing prenatal care are in a strategic position to screen for violence. The percentage of women who report that a doctor, nurse, or other health care worker talked with them about physical abuse by intimate partners has significantly increased since the first PRAMS survey, although it still remains very low.

Figure 5. Percentage of Pregnant Women Whose Health Care Provider Talked About Physical Abuse, by Medicaid Status, Colorado PRAMS, 1997-2002



In 1997, an estimated 27 percent of women had such a discussion with their health care provider; in 2003 this percentage had increased to 38 percent. Providers delivering

prenatal care to Medicaid recipients are more likely to discuss this issue than those delivering care to non-Medicaid recipients. Women receiving Medicaid were more likely to report providers discussing abuse with them; yet this percentage has changed little since 1998. Figure 5 presents the percentage of women by Medicaid status whose health care provider had discussed abuse during pregnancy.

Health-Related Behaviors

Prenatal care is also important because it provides an opportunity to identify behaviors during pregnancy that pose health risks to the mother and her infant. By identifying these behaviors, health care providers are in a position to educate women about risks and provide counseling and support in changing these behaviors. These behaviors include smoking and alcohol use as well as gaining an adequate amount of weight during pregnancy. Healthy People 2010 has set the following goals for these health-related behaviors during pregnancy:

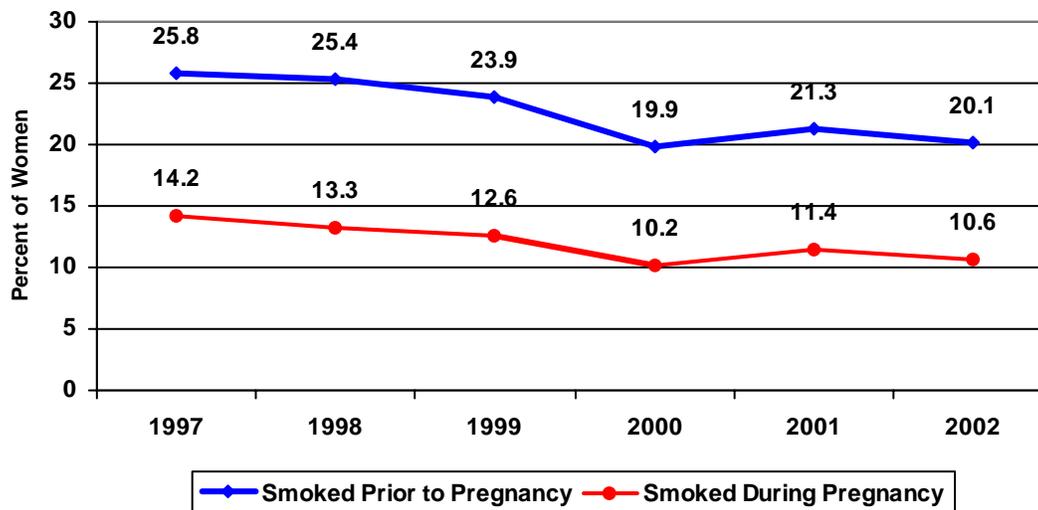
- Increase abstinence from cigarettes to 99% among pregnant women
- Increase abstinence from alcohol among pregnant women to 94%
- Increase the proportion of mothers who achieve a recommended weight gain during their pregnancy.

Smoking During Pregnancy

Women who smoke during pregnancy are at risk for premature birth, pregnancy complications, low-birth weight infants, stillbirth, and a higher rate of infant mortality. (7) Smoking during pregnancy was found to be the second leading cause of low weight birth among singleton births in a study done in 2000 by the Colorado Department of Public Health and Environment. (8) Data from PRAMS indicate that the percentage of women smoking prior to pregnancy and during pregnancy has been declining both nationally and in Colorado. Figure 6 on the following page shows the proportion of Colorado women who were smoking during the 3 months prior to pregnancy and those who smoked during the last 3 months of pregnancy for the years 1997-2002. There was a 22 percent decline from 1997 to 2002 in the percentage of women who were smoking during the three months prior to pregnancy and a 25 percent drop in the percentage of women who smoked during the last three months of pregnancy. Smoking during pregnancy was about half the level of smoking prior to pregnancy.

From 1997 through 2002, Medicaid recipients were much more likely to be smokers during the three months prior to pregnancy and the last three months of pregnancy than non-Medicaid women. However, this group of women shows a similar rate of decline between pre-pregnancy smoking and smoking during the last three months compared to their non-Medicaid counterparts. In 1997, 43 percent of mothers receiving Medicaid prenatal care coverage smoked three months prior to pregnancy. This dropped to 31 percent in 2003; a 28 percent decrease. From 1997 to 2003 the change in the smoking rate among women receiving Medicaid during the last three months of pregnancy dropped by one-third, from 25 to 17 percent.

Figure 6. Percentage of Women Delivering a Live Birth Who Smoked in the 3 Months Prior to Pregnancy and During the Last 3 Months of Pregnancy, Colorado PRAMS, 1997-2002



While the proportion of women smoking during pregnancy has decreased during the last six years, Colorado PRAMS data also indicate that the proportion of women who report that a health care worker talked with them about smoking during pregnancy has decreased. In 1997, close to 81 percent of all women said that a health care worker talked to them about tobacco use during pregnancy; that figure dropped to 68 percent in 2002. This proportion dropped for both Medicaid and non-Medicaid recipients. In 1997, over 90 percent of Medicaid recipients reported such information being conveyed; in 2002 this declined to 79 percent. The U.S. Preventive Services Task Force has found good evidence that smoking cessation counseling utilizing self-help materials tailored for pregnant smokers substantially increases cessation rates during pregnancy resulting in increased birth weights. Thus, this group recommends that clinicians screen all pregnant women for tobacco use and provide augmented pregnancy-tailored counseling to those who smoke. (9) It is important, even though smoking rates have dropped, to assure that such sessions are an integral part of prenatal care.

Smoking After Delivery

Despite the fact that the proportion of women who smoke prior to pregnancy has declined in recent years, and despite the fact that the proportion of women who smoke during pregnancy has declined, a substantial proportion of mothers continue to resume smoking after the birth of their infant. Data from the 1997 PRAMS survey reveal that 20.2 percent of mothers acknowledged smoking at 2 to 4 months postpartum, compared to 14.2 percent smoking during the last 3 months of pregnancy. In 2002, survey data showed 14.0 percent smoking at 2 to 4 months postpartum after 10.6 percent acknowledged smoking during the last 3 months of pregnancy. These findings have implications for the infant in terms of secondhand smoke, not to mention for the long-term health of the mother.

Alcohol Use During Pregnancy

Alcohol use during early pregnancy can result in spontaneous abortion, behavioral and learning problems in children, fetal alcohol syndrome, and low birth weight. Continued alcohol use throughout pregnancy can worsen these effects and result in preterm delivery. Because no safe level of alcohol use during pregnancy has been identified, women are encouraged to abstain from alcohol throughout pregnancy. In fact, in February 2005, the Surgeon General advised all pregnant women, as well as women who may become pregnant, to completely abstain from alcohol. (9)

Data from Colorado PRAMS indicate that the prevalence of alcohol use before and during pregnancy has remained stable since 1997. In 2002, 53.4 percent of mothers drank alcohol prior to pregnancy and 9.5 percent of mothers used alcohol during their last three months of pregnancy. Non-Medicaid recipients were much more likely to report using alcohol during the last three months of pregnancy than women receiving Medicaid (11.6 percent vs. 5.2 percent). The proportion of women who report that a health care worker discussed alcohol use during pregnancy with them during prenatal visits has decreased since the first PRAMS survey. Close to 89 percent of women in 1997 said that a health care worker talked about alcohol consumption during their prenatal care; in 2002 that proportion had fallen to 69 percent.

In a recent study of eight states that participate in PRAMS, Colorado had the highest rates of alcohol use during the last three months of pregnancy; 9.9 percent for years 2000-2001. (11) The other states' prevalence of alcohol use during pregnancy ranged from 3.6 to 6.2 percent. Colorado's prevalence of alcohol use during pregnancy was approximately 60 percent higher than the state with the next highest prevalence rate. Alcohol use has been known to be high among many different populations in Colorado compared to other states and this finding is consistent. (12) Groups with the highest alcohol use rate during pregnancy in Colorado included women in older age groups (25 and older), those with more than a high school education, those with incomes 200 percent above the federal poverty level, those of white race, and those of non-Hispanic origin. (11).

Inadequate Weight Gain During Pregnancy

Inadequate weight gain during pregnancy was found to be the number one contributor to Colorado's high low birth weight rate in a 2000 study by the Colorado Department of Public Health and Environment, *Tipping the Scales: Weighing in on Solutions to Colorado's Low Birth Weight Problem*. (8) Women who fail to gain adequately are at increased risk for a low birth weight baby. Recommendations from the Institute of Medicine define adequate weight gain as 25-35 pounds for a full term infant for women of all ages and races whose pre-pregnancy weight is neither over or under that considered normal, with a rate of gain of approximately one pound per week in the second and third trimesters. (13) Based on Colorado PRAMS results, it is estimated that close to one in four women did not gain enough weight during their pregnancy in 2002; this is a rate that has been stable since the PRAMS survey project began.

Historically, those receiving Medicaid have had a higher percentage of women who do not gain weight adequately during pregnancy compared to non-Medicaid women. In

1997 and 2002, this higher rate of inadequate weight gain among Medicaid women was statistically significant. Yet, inadequate weight gain is a problem among women in all age groups, educational levels, socioeconomic levels, and racial and ethnic groups. In all these groups, the proportion of women not gaining enough weight does not fall below one in five, and there has been no improvement in the rate of inadequate weight gain in six years of PRAMS data since 1997. In that year, 22.1 percent of mothers failed to gain adequately, and in 2002, 24.5 percent also gained inadequately.

Focus groups of pregnant women revealed in 2002 that many have pregnancy weight gain goals that are inappropriately low. The women receive outdated low weight gain messages from their relatives, appear to be influenced by pregnant but very slender movie stars, and are skeptical about the proven relationship between weight gain and infant birth weight. They do not feel that doctors want to discuss weight gain with them even though they are eager for their advice on the subject. (14)

Approximately 80 percent of women report that a health care worker discussed weight gain during pregnancy during their prenatal visits. This percentage did not vary by women's pre-pregnancy weight or whether they had gained an adequate amount of weight. Beginning with 2004 surveys, Colorado PRAMS is asking exactly how much weight women are being told to gain. This will be combined with body mass index data to determine whether health care providers are providing correct information to their clients.

Summary

A variety of factors both before and during pregnancy greatly influence the health of the mother and her newborn. Whether or not a pregnancy is intended, whether or not contraception is used, and whether or not a woman has access to early and adequate prenatal care have an impact on newborn outcomes. Two out of three (66 percent) Colorado women do have access to care, but this proportion falls far short of the Healthy People 2010 goal of 90 percent. Just over half of Hispanic women have access to adequate care. Hispanic women who themselves were born in Mexico comprise more than half of all Hispanic women giving birth. Women born outside the United States who are low income and undocumented do not have access to Medicaid for prenatal care, other than emergency Medicaid coverage for labor and delivery.

Premature labor is a common problem and is especially evident in the Medicaid population. Another issue is postpartum depression which seriously affects at least 15 percent of all new mothers. In addition, physical abuse during pregnancy, while limited to a small minority of women, has negative effects on the mother and potentially on the newborn. Health care providers are more likely to discuss abuse with Medicaid patients than with non-Medicaid patients, but overall, 6 in 10 patients receive no information at all on this topic.

Maternal smoking during pregnancy is a critical health issue for the infant, and is closely associated with low birth weight. While Colorado women have decreased their smoking rates, currently about 1 in 10 still smokes at the end of their pregnancy. Alcohol use is another critical health issue. One in 10 women continues to use alcohol during

pregnancy, and this rate is considered to be high. While women who smoke are more likely to be less educated and have lower incomes, women who drink are more likely to be more educated and have higher incomes.

Inadequate maternal weight gain is the largest contributor to Colorado's low birth weight rate, larger than smoking. One in four women fails to gain enough weight, thereby increasing her risk of a low birth weight infant. A statewide campaign, "A Healthy Baby is Worth the Weight," is underway to address the problem.

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Infant Health

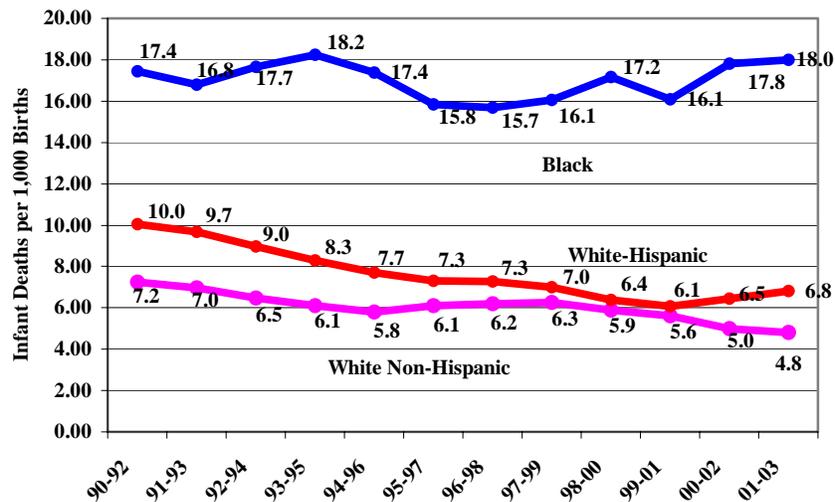
Infants who receive the healthiest start in life have the best chance for continued health and well being into childhood, adolescence and adulthood. The discussion is focused on indicators of infant health in Colorado, such as infant mortality, and major causes of neonatal and postneonatal mortality. In addition, preventive measures that lower the risk of morbidity in infancy such as breastfeeding, sleep position, and avoidance of second hand smoke are discussed. Data for these indicators are taken from birth and death certificates and the Colorado Pregnancy Risk Assessment and Monitoring System (PRAMS).

Infant Mortality

In Colorado in 2003, 419 infants died before the age of 1. In the last decade, the rate of infant mortality has declined dramatically. The rate decreased from 8.8 deaths per 1,000 births in 1990 to 6.0 deaths per 1,000 births in 2002 and 2003, a drop of one-third. Colorado's infant mortality rate ranks 12th nationally. (1)

Healthy People 2010 set a national objective to reduce infant mortality to 4.5 deaths per 1,000 births by the end of the decade. (2) With a current rate in Colorado of 6.0, an additional reduction of 1.5 deaths per 1,000 births seems small. However, such a change presents an immense challenge and requires a 25 percent further decline. Such a change would also result in over 100 fewer infant deaths each year.

Figure 7. Infant Mortality Rates by Race/Ethnicity, Three-Year Averages, Colorado 1990-1992 to 2001-2003

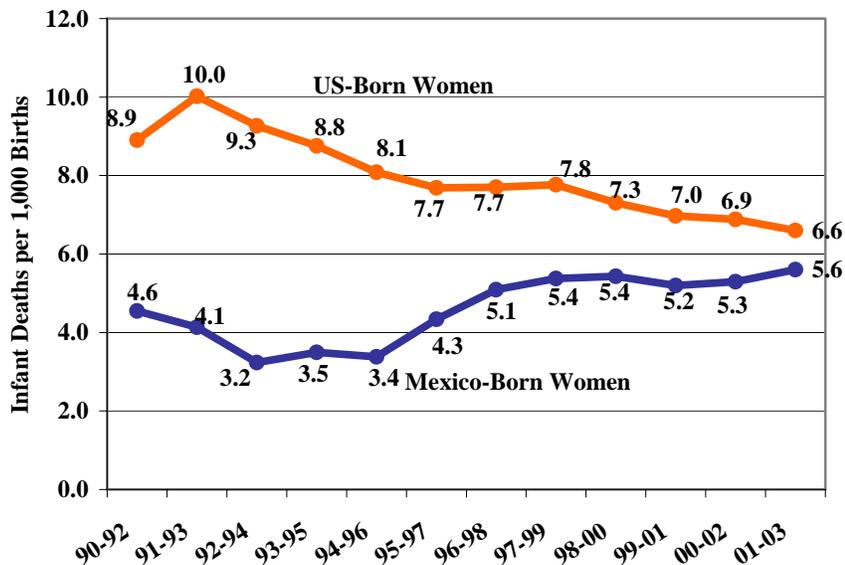


Infant mortality rates are significantly higher among Black infants than among White Hispanic or White non-Hispanic populations. Figure 7 provides 3-year average rates of infant mortality by the three major racial and ethnic groups in Colorado; other racial groups are not shown, since they comprise fewer than 2 percent of all infant deaths. The three-year average infant mortality rate for Blacks was nearly three times higher than the

rate for White non-Hispanics in most recent years. Infant mortality rates for Blacks increased from a low of 15.7 deaths per 1,000 births in the three-year period 1996-1998 to 18.0 in 2001-2003, a 15 percent increase. White Hispanic and White non-Hispanic rates are very similar, although White Hispanic rates are generally higher.

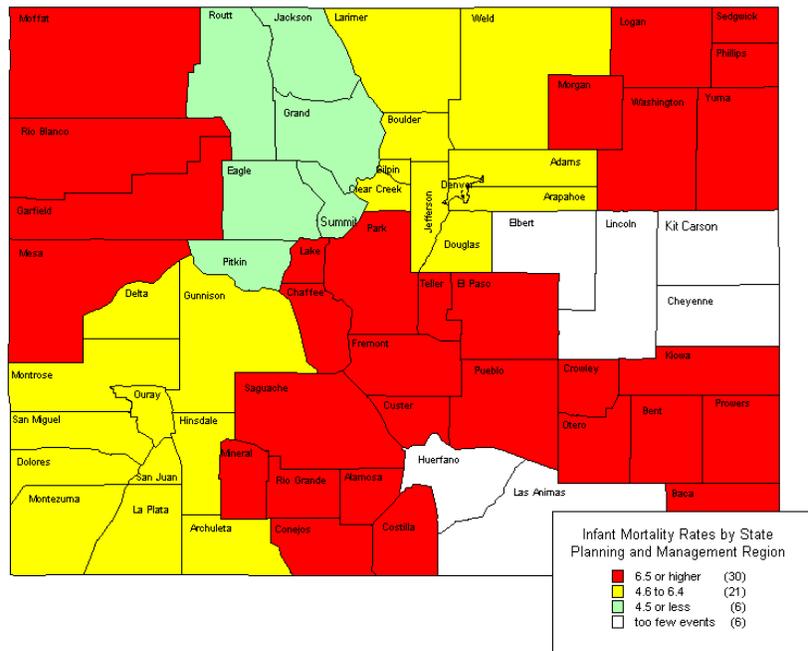
In Colorado, over 95 percent of Hispanic births are to women who were born in either the United States or in Mexico. (3). Figure 8 presents the infant mortality for Hispanic births for these two groups and shows that US-born Hispanic women have experienced higher infant mortality rates than Mexico-born women. Yet this difference has been closing due to both a falling death rate among infants to US-born Hispanic mothers and a rising death rate among infants to Mexico-born women. The death rate for infants born of US-born Hispanic women fell steadily from the 1991-1993 annual average of 10.0 infant deaths per 1,000 live births to a low of 6.6 in 2001-2003. However, the death rate of infants born to Mexico-born women has increased since the 1992-1994 three-year annual average of 3.2, rising to a high of 5.6 in 2001-2003.

Figure 8. Infant Mortality Rates of US-Born and Mexico-Born Hispanic Women, Three-Year Averages, Colorado 1990-1992 to 2001-2003



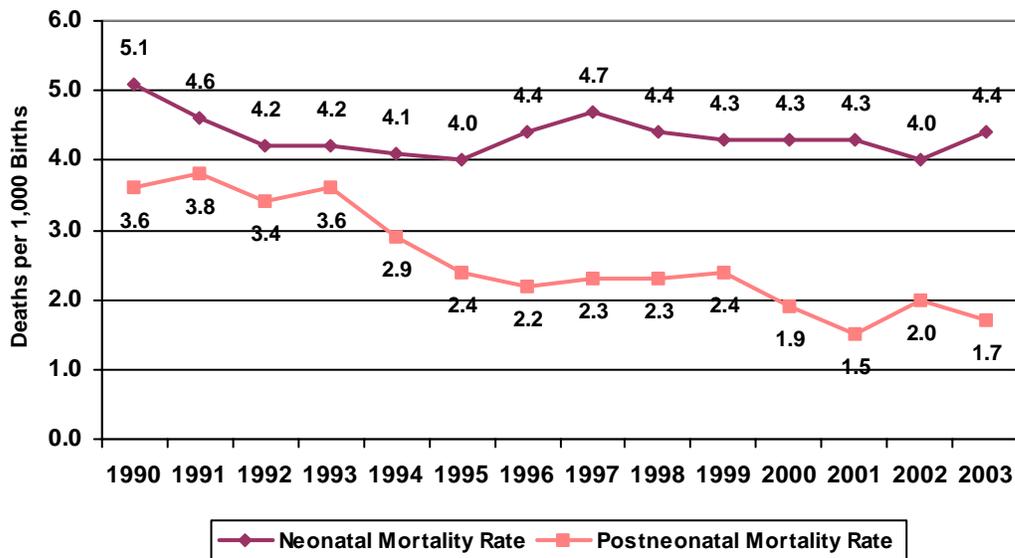
Infant mortality rates vary throughout the state. Using a 5-year annual average from 1999-2003, the central mountain planning and management region including Eagle, Grand, Jackson, Routt, and Summit counties had the lowest infant death rate during that period, 3.9 per 1,000 live births, shown in green in Map 3, which met the Healthy People 2010 goal. Four regions--Larimer and Weld; the greater metropolitan Denver area; the southwestern corner of the state, and the Delta-Montrose area-- had rates that were between 4.6 and 6.4, shown in yellow in the map. The remaining regions shown in red had rates of 6.5 or higher.

Map 3. Infant Mortality Rates by Population-Based Region of Residence, Five-Year Annual Average, Colorado Residents 1999-2003



Infant deaths can be analyzed further by classifying the deaths as neonatal or postneonatal. Neonatal deaths take place prior to the 28th day of life while postneonatal deaths occur from age 28 days to one year. In the last decade, 63 percent of all infant deaths occurred in the neonatal period. (3) In 2003, there were 304 neonatal deaths and 115 postneonatal deaths, yielding rates of 4.4 per 1,000 live births for neonatal deaths and 1.7 for postneonatal deaths. Colorado ranked 20th nationally with its 4.3 neonatal death rate in 1999-2001. (4). Colorado ranked 5th, one of the lowest rates in the nation, with its 1.5 postneonatal death rate in 2001, the most recent year for which there are comparable data on postneonatal deaths.

Figure 9. Neonatal and Postneonatal Mortality Rates, Colorado, 1990-2003



The differences in infant mortality rates seen by race/ethnicity are also present in both neonatal and postneonatal death rates. In 2001-2003, the neonatal mortality rate for Blacks was nearly three times greater than the rate for White non-Hispanics (13.1 per 1,000 births vs. 3.3). The postneonatal mortality rate for Blacks was 4.9 per 1,000 births compared to 1.5 for White non-Hispanics. Since 1999-2001, the neonatal mortality rate has increased for both Blacks and White Hispanics. In that time period, the annual average neonatal mortality rates were 11.6 per 1,000 live births for Blacks and 4.4 for White Hispanics. In 2001-2003, the three-year annual average rose to 13.1 for Blacks and 5.0 for White Non-Hispanics.

In 2003, the three major causes of neonatal deaths, accounting for 69 percent of all such deaths, were disorders relating to length of gestation and fetal nutrition (28 percent); congenital malformations, deformations and chromosomal abnormalities (21 percent); and maternal factors and complication of labor and delivery (21 percent). The major causes of the 115 postneonatal deaths in 2003 were sudden infant death syndrome (24 percent); disorders relating to congenital malformations and deformations and chromosomal abnormalities (24 percent); and unintentional injuries (10 percent).

An in-depth analysis of infant mortality in the state was undertaken in 2003. The full report, *Infant Mortality in Colorado*, sought to describe the patterns of infant mortality since 1990, to delineate contributing factors, and to outline strategies for reducing the rate. (3) Additional analysis was performed using the Perinatal Periods of Risk (PPOR) model, which further breaks down the components contributing to infant mortality, including fetal deaths, and suggests modes of intervention. Using this model along with PRAMS and Vital Statistics data, a series of county worksheets were provided that can be used to strategize how to reduce infant mortality on the local level. The report can be accessed on-line at www.cdphe.state.co.us/ps/mch/Infantmortality/index.html.

Sudden Infant Death

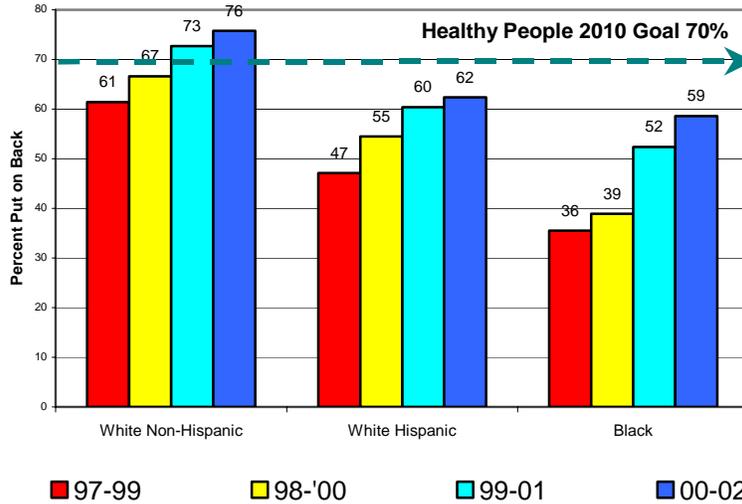
Sudden Infant Death Syndrome (SIDS), the leading cause of postneonatal death, has shown a steady decrease since the early 1990s. The reduction in the SIDS rate dramatically influenced the decline in postneonatal mortality. Since 1990, the rates of SIDS in Colorado have been reduced from 2.0 to 0.4 deaths per 1,000 births, with the sharpest one-year decline occurring between 1993 and 1994. The rates have remained at 1.0 or less since 1996.

The decreasing rate of SIDS is likely a result of the initiation of the 1994 “Back to Sleep” Campaign. This campaign, based on recommendations from the American Academy of Pediatrics, urged parents to put their infants on their backs when sleeping. This sleeping position has been found to greatly lower the risk of SIDS in infants. The Healthy People 2010 objective states that at least 70 percent of all infants should be put to sleep on their backs. (2)

Women age 25 and older and White non-Hispanic women are likely to report that they put their infants to sleep on their backs. The proportion of mothers who “most often” put their baby to sleep on their backs has shown a steady increase among all racial and ethnic groups since the first Colorado PRAMS surveys were done in 1997. Figure 10 illustrates

that while the proportion of mothers putting their infants to sleep on their backs has increased over time for each of the three major racial/ethnic groups in Colorado, the goal of 70 percent has not been reached for either White Hispanic or Black infants.

Figure 10. Percentage of Mothers Who Report that They Most Often Put Their Infants to Sleep on Their Backs by Race/Ethnicity, Three-Year Averages, Colorado PRAMS, 1997-1999 to 2001-2003



Low Birth Weight

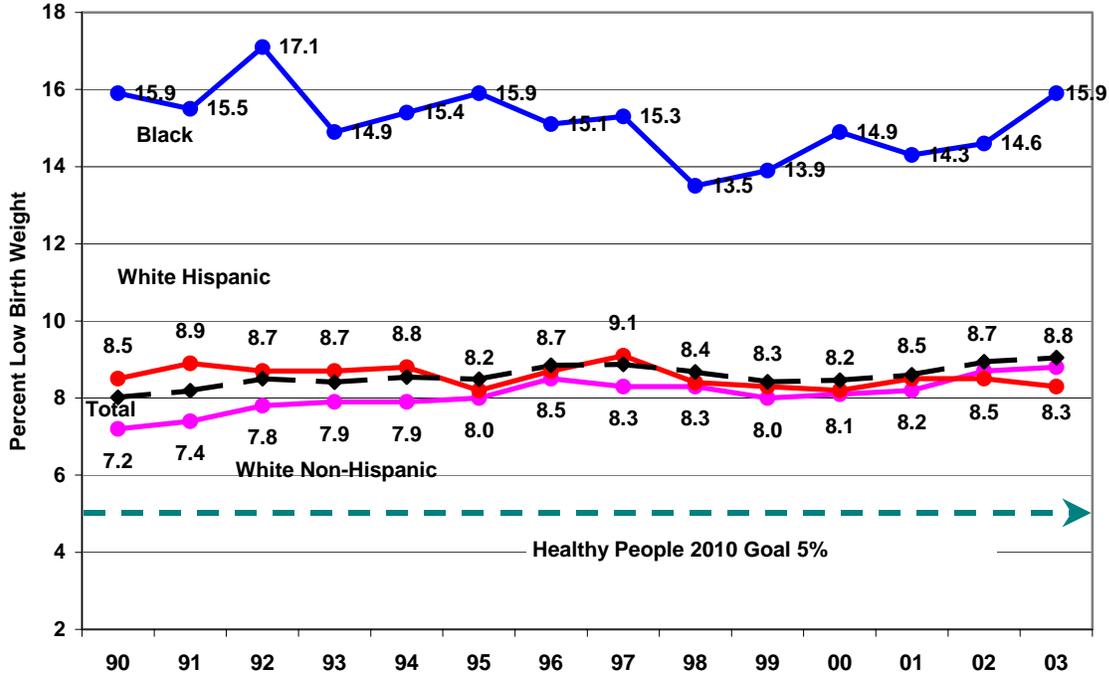
Low birth weight, defined as a birth weight of 5 pounds 8 ounces or less than 2500 grams, is the risk factor most closely associated with neonatal death; thus, improvements in infant birth weight can contribute substantially to reductions in the infant mortality rate. Also important are the long-term effects of low birth weight on infants who survive their first year, as these infants are more likely to experience long-term developmental and neurological disabilities than are infants of normal birth weight. (2)

Colorado continues to have one of the highest low birth weight rates in the nation. In 2003, 9.0 percent of all births, a total of 6,272 infants, weighed less than 2500 grams at birth. In 2002, the year for which the most recent national data are available, only 10 states had a higher percentage of low weight births than Colorado. (5) Healthy People 2010 has set the national objective to decrease the percentage of low birth weight newborns to 5.0 percent of all births.

In Colorado and the nation as a whole, the percentage of births that are low birth weight varies by race and ethnicity. Figure 11 presents the percentage of low weight births for the three largest racial/ethnic groups in the state. The percentage of births that are less than 2500 grams has increased for White non-Hispanics from 7.2 percent in 1990 to 8.8 percent in 2003. White Hispanic rates have shown some fluctuation over this time period but have generally stayed in the 8 to 9 percent range. In 2002 and 2003 White Hispanics had the lowest low birth weight percentage of the three groups shown. Blacks, however, have always had a much higher percentage of low weight births than the other two groups. Between 1992 and 1998 this percentage showed a decline, but an increase can be

observed in the last five years. The rate in 2003 for Blacks is the same as it was in 1990: 15.3. Rates for Asians and Native Americans (not shown) were between 9 and 10 percent over the same period.

Figure 11. Percent of Low Birth Weight Births by Race/Ethnicity, Colorado, 1990-2003



The Colorado Department of Public Health and Environment examined the problem of low birth weight in a report, *Tipping the Scales: Weighing in on Solutions to the Low Birth Weight Problem in Colorado*, written in 2000. The report estimates how many low weight births are attributable to various risk factors in Colorado. (6) The two behavioral risks of inadequate weight gain during pregnancy and smoking during pregnancy appear to be the most important factors contributing to the low birth weight rate in Colorado. The study found that the state’s low birth weight rate could be reduced by over one-third if all women gained weight adequately and no women smoked. Such a decline would result in a low birth weight rate close to 6 percent, approaching the Healthy People 2010 goal.

Breastfeeding

Breastfeeding is known to be beneficial to both the infant and the mother. Epidemiologic research shows that human milk and breastfeeding of infants provide advantages with regard to general health, growth, and development, while significantly decreasing risk for a large number of acute and chronic diseases. Research in the United States, Canada, Europe, and other developed countries provides strong evidence that human milk feeding decreases the incidence and/or severity of diarrhea, respiratory tract infection, otitis media, bacteremia, bacterial meningitis, urinary tract infection, and necrotizing enterocolitis. There are a number of studies that show a possible protective effect of human milk feeding against Sudden Infant Death Syndrome, insulin-dependent and non-

insulin dependent diabetes mellitus, lymphoma, allergic diseases such as asthma, and other chronic digestive diseases. Breastfeeding has also been related to possible enhancement of cognitive development and a reduced risk of obesity. (8).

The American Academy of Pediatrics recommends that an infant be breastfed without supplemental foods and liquids for the first 6 months of age and that breastfeeding continue through at least the first 12 months of life. (8) The Healthy People 2010 goal for the nation is to have 75 percent of mothers initiate breastfeeding, 50 percent continue to breastfeed their infant to 6 months, and 25 percent continue to 1 year.

The National Immunization Survey (NIS) is a nationwide survey within all 50 states done by the Centers for Disease Control and Prevention (CDC) Immunization Program and the CDC's National Center for Health Statistics. The original goal of the survey was to estimate the proportion of children receiving immunizations. Starting in 2003, breastfeeding questions were included in the NIS. The results from this survey can be used to estimate the national prevalence of breastfeeding practices and the state level as well. Based on the 2003 survey, nationally 70.9 percent of mothers initiated breastfeeding. (9) Colorado's initiation rate (83.1%) was clearly above the national average. However, only 45.6 percent of Colorado's mothers were breastfeeding their infant at 6 months and 21.3 percent at 12 months. The national rate for breastfeeding at 6 months was 36.2 percent; at 12 months it was 17.2 percent. Colorado was one of 14 states that achieved the goal of 75 percent or more initiating breastfeeding, while six states achieved all three of the Healthy People 2010 breastfeeding goals. (9)

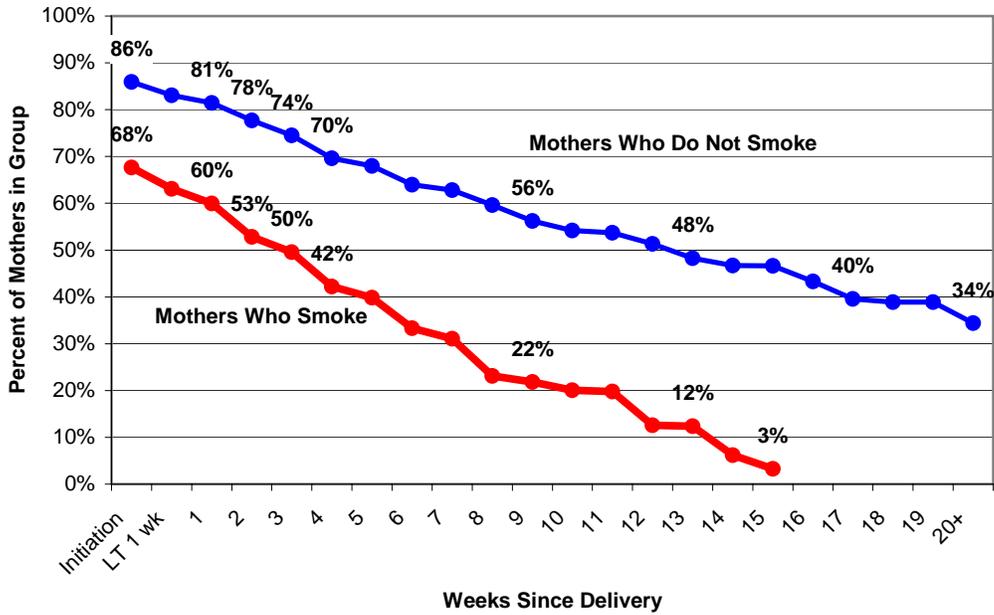
Questions on breastfeeding are on the Colorado PRAMS survey as well. Respondents were asked if they ever breastfed or pumped breast milk to feed their new baby after delivery. The rate of those initiating breastfeeding has increased from 81.0 percent in 1997 to 85.5 percent in 2002, slightly higher but comparable to that reported by the NIS. While Medicaid recipients had significantly lower initiation rates than those not on Medicaid each year, both groups reached the Healthy People 2010 goal of 75 percent by 2002. In that same year, a significantly higher proportion of women on Medicaid reported that their health care provider had discussed breastfeeding during a prenatal visit than among non-Medicaid women (85.6% vs. 77%).

Women gave a number of reasons for stopping breastfeeding. In 2002, 39 percent of mothers said that they stopped because they were not producing enough milk; 38 percent because nursing did not satisfy their baby; and over 25 percent because the baby had difficulty nursing.

Analysis of Colorado PRAMS data also indicates that mothers who smoked during the last three months of their pregnancies were less likely to initiate breastfeeding and less likely to continue breastfeeding. (Figure 12). While 86 percent of non-smoking mothers initiated breastfeeding, only 68 percent of mothers who smoked started. Additionally, by 13 weeks (3 months) only 12 percent of mothers who smoked were still breastfeeding.

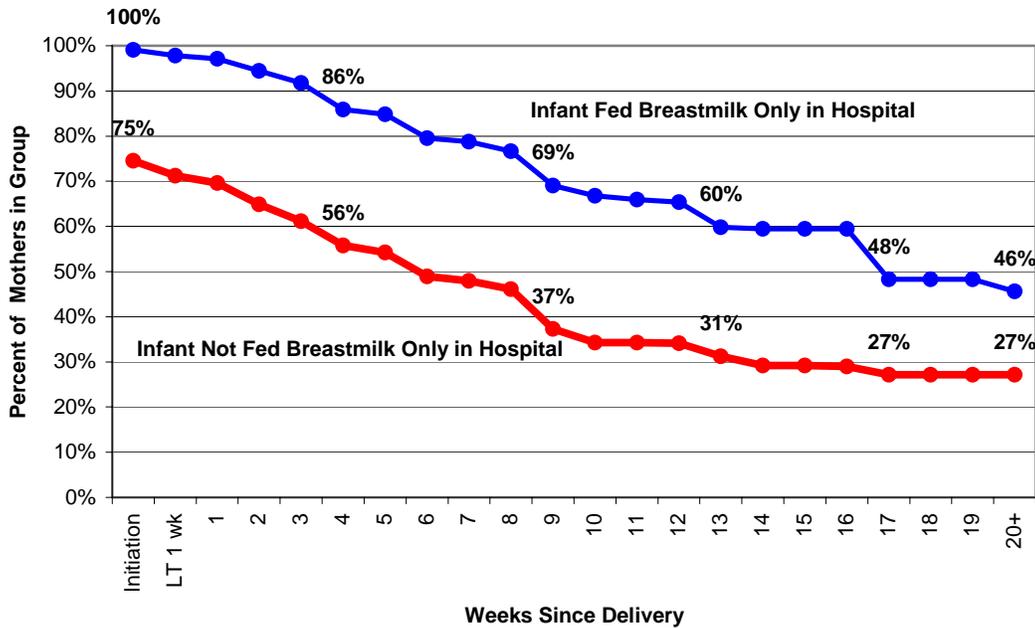
Hospital practices are also associated with breastfeeding initiation and continuation rates. Initiation of breastfeeding was more likely to occur if started within one hour of birth.

Figure 12. Breastfeeding Continuation Rates by Smoking Status of Mother in the Last 3 Months of Pregnancy, Colorado PRAMS, 1997-2002



Where hospital staff helped women learn how to breastfeed these mothers were also more likely to initiate breastfeeding than those who did not get such help from hospital staff (95 percent vs. 58 percent). (Figure 13). Close to 50 percent of those infants who were

Figure 13. Breastfeeding Continuation Rates Among Infants Who Were Only Fed Breast Milk in the Hospital and All Others, Colorado PRAMS, 2002



fed only breast milk in the hospital were still breastfeeding at 20 weeks while a quarter of infants (27 percent) who were fed something in addition to breast milk were still breastfeeding.

An infant who did not use a pacifier in the hospital was also more likely to be breastfeeding at 20 weeks compared to an infant who did use a pacifier in the hospital. While there was only a small difference in initiation rates among these two groups (89 percent vs. 83 percent) there was a large difference in breastfeeding rates at 20 weeks. Over 45 percent who had not used a pacifier were still breastfeeding at 20 weeks compared to 26 percent of infants who had used a pacifier in the hospital (not shown).

Secondhand Smoke

Secondhand smoke is the mixture of smoke exhaled by smokers and smoke that comes from the burning end of a cigarette, cigar, or pipe. A baby who is exposed to secondhand smoke and lives in a home where one or both parents smoke is more likely to have lung disease serious enough to require treatment in a hospital during the first two years of life. (10) In addition, the World Health Organization states that secondhand smoke has been identified as a cause of Sudden Infant Death Syndrome. (11) While the percentage of women who report smoking after the birth of their baby decreased between 1997 and 2002 (see Pregnancy and Prenatal Care Section), the proportion of infants who have ever been in a room when someone was smoking was found to be 5.2 percent in 2002 (PRAMS survey data). Younger mothers are more likely to report that their infants have ever been in a room with someone who is smoking. For the period 2000 to 2002, 11 percent of mothers aged 15 to 24 reported leaving their infants in a room with someone who was smoking, compared to 5 percent of mothers 25 and older.

Summary

Infants who receive the healthiest start in life have the best chance for continued health and well being into childhood, adolescence, and adulthood.

In the last decade, the infant mortality rate declined dramatically, reaching a new low of 6.0 deaths per 1,000 births in 2002. Infant mortality rates remain three times higher for Black infants, however. White non-Hispanic and White Hispanic rates are much closer together. The Healthy People 2010 goal is for the overall rate to decline to 4.5, which requires a substantial further decline.

The neonatal death rate has changed little in the last decade. Colorado's postneonatal rate on the other hand, was one of the lowest in the country in 2001, when it reached 1.5 deaths per 1,000 births. Sudden Infant Death Syndrome, the leading cause of postneonatal death, has shown a steady decrease since the early 1990s, and its decline, largely accomplished through putting babies to sleep on their backs, is the major factor underlying the overall decline.

Low birth weight continues to be a critical infant health issue in the state, and the current rate of 9.0 percent is one of the highest in the nation. While the rate decreased to a low of 8.4 percent in 1999, it has been increasing since that time. Two of the major contributors to the rate are inadequate maternal weight gain in pregnancy and smoking in pregnancy.

If all women gained weight adequately and no women smoked, the overall low birth weight rate would decline to nearly 6.0 percent, approaching the Healthy People 2010 goal of 5.0 percent.

Breastfeeding provides ideal nutrition for infants. Colorado mothers more than meet the Healthy People 2010 goal of 75 percent initiating breastfeeding. However, many women stop breastfeeding in the first or second month after delivery. Hospital practices like helping women learn to breastfeed appear to have a positive impact on breastfeeding rates and duration. Smokers are far less likely to initiate breastfeeding and far more likely to stop breastfeeding than non-smokers. In addition, many infants are exposed to secondhand smoke in the home.

References—Infant Health

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Child Health

Health indicators for children ages 1 to 14 include immunization rates, death rates, and leading causes of death and hospitalizations, as well as health risks for chronic diseases. Population-based data for child health indicators in Colorado have been very limited. Those available include the National Immunization Survey, death certificates, and hospital discharge data.

To develop a better picture of child health and health risk factors in Colorado, the Colorado Child Health Survey was initiated by the state health department in January 2004. All respondents to the Colorado Behavioral Risk Factor Survey who have a child in the household between 1 and 14 are asked to participate in this survey. One child of that age in the household is randomly chosen and questions regarding health and health risk behaviors are asked about this particular child. Data from this new survey presented in this report are from the first full calendar year (2004) and have been weighted to the age and sex stratification of the state and for potential response bias. The Child Health Survey sample covered 997 children, and begins to give us a look at the state of child health in Colorado.

Childhood Mortality

The Healthy People 2010 objectives for the mortality rate among children are:

- 25.0 deaths per 100,000 children ages 1-4.
- 14.3 deaths per 100,000 children ages 5-9.
- 16.8 deaths per 100,000 children ages 10-14. (1)

In 2003, Colorado met and exceeded the goal for children 5-9 but fell short of meeting the goals in the other age groups. The number of deaths and mortality rates for the age groups were:

- 79 deaths resulting in 30.2 deaths per 100,000 children 1-4.
- 34 deaths resulting in 12.9 deaths per 100,000 children 5-9.
- 68 deaths resulting in 21.0 deaths per 100,000 children 10-14.

The leading cause of death for children 1 to 14 years old and for both males and females within each age group is unintentional injury. (2) The 2nd through 5th causes of death vary slightly by age group. Table 4 provides the ranking of causes of death for each age group and compares this to the nation as a whole for 2001, the most recent year that data are available for national rates. Unintentional injury rates were lower for Colorado than the nation among 1 to 4 year olds; but Colorado has higher rates of unintentional injury and markedly higher rates of suicide among 10 to 14 year olds compared to the national rates. As can be seen from these data, suicide deaths emerge as a problem among those 10 and older. Yet, this is only a comparison for one year; it is unknown whether these differences between national and Colorado child mortality rates would be similar in more recent years or if the differences seen in 2001 are statistically significant differences.

Table 4. Percentage of Total Deaths and Death Rates by Age for Leading Causes of Death Among Children 1-14, Colorado and the United States, 2001

	United States			Colorado		
	Rank	Percent of All Deaths	Death Rate*	Rank	Percent of All Deaths	Death Rate*
Ages 1-4						
Unintentional Injuries	1	33.6	11.2	1	26.4	7.7
Congenital Malformations	2	10.9	3.6	2	13.9	4.1
Homicide/Legal Interv.	4	8.1	2.7	3	8.3	2.4
Cancers	3	8.2	2.7	4	6.9	2.0
Disease of the Heart	5	4.4	1.5	5	5.6	1.6
Ages 5-9						
Unintentional Injuries	1	41.5	6.4	1	38.1	5.1
Cancers	2	15.9	2.4	2	14.3	1.9
Homicide/Legal Intervention	4	4.4	0.7	3	11.9	1.6
Disease of the Heart	5	3.2	0.5	3	11.9	1.6
Congenital Malformations	3	5.9	0.9	**	**	**
Ages 10-14						
Unintentional Injuries	1	38.8	7.4	1	39.5	9.4
Suicide	3	6.8	1.3	2	17.1	4.1
Cancers	2	12.9	2.5	3	7.9	1.9
Congenital Malformations	4	4.8	0.9	4	5.3	1.3
Homicide/Legal Interv.	5	4.7	0.9	4	5.3	1.3
Disease of the Heart	6	4.3	0.8	4	5.3	1.3

*Rates are per 100,000 population

**Less than 3 events

The major cause of unintentional injury deaths in all three age groups was injuries due to motor vehicle crashes, followed by drowning. From 2001 to 2003, 63 percent of deaths from unintentional injuries were due to motor vehicle crashes; 13 percent were from drowning.

Homicide was the leading cause of intentional injury deaths among those 1 to 9 and suicide was the leading cause of intentional injury deaths among those 10 to 14. There were a total of 67 intentional injury deaths from 2001 to 2003 in Colorado for ages 1 to 14; 39 percent of these involved firearms. Of the 498 hospitalizations due to assaults and suicide attempts from 2000 to 2002, only 4 percent involved an injury from a firearm, indicating the lethality of intentional firearm injuries.

Boys have higher rates of injury mortality and injury hospitalizations than girls of the same age. Figures 14 and 15 indicate that these rates have been decreasing for both boys and girls during the last decade. The three-year annual average death rate declined 14 percent for boys and 20 percent for girls from 1995-1997 to 2000-2002. The coding for injury deaths changed slightly in 1999 when deaths were categorized using the International Classification of Diseases, version 10 (ICD-10); ICD-9 was used prior to that. However, even with this change the injury mortality rate showed steady decreases

after the coding change. The hospitalization rates for all injuries (which are coded using ICD-9) dropped 19 percent for boys and girls during this same time period.

Figure 14. Total Injury Death Rates for Children 1-14 by Sex, 3-Year Annual Average, Colorado, 1995-1997 to 2000-2002

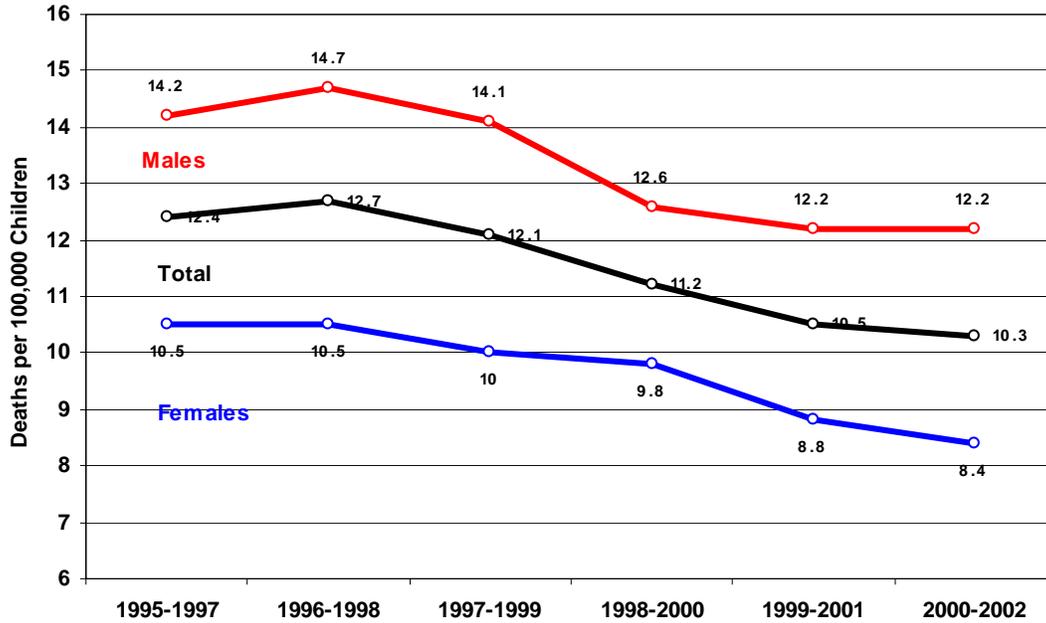
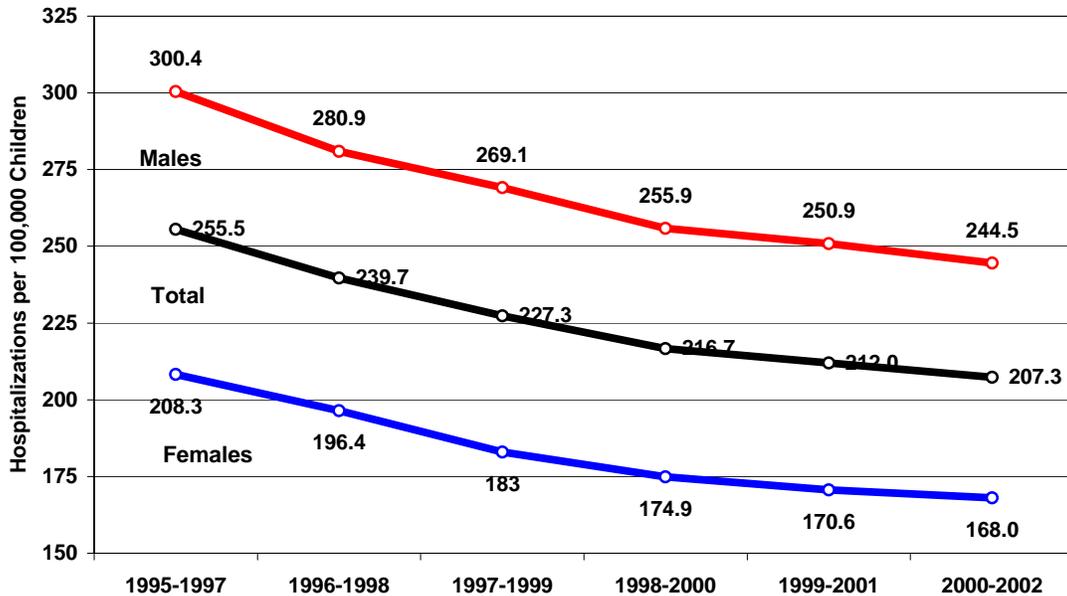


Figure 15. Total Injury Hospitalization Rates for Children 1-14 by Sex, 3-Year Annual Average, Colorado, 1995-1997 to 2000-2002



Injuries sustained in falls were the most prevalent type of injury that required hospitalization for children 1 to 9 and for males 10 to 14 among all Colorado children from 2000 to 2002. However, for girls age 10 to 14 a suicide attempt was the most prevalent cause of injury hospitalization in that same time period. Figures 16 through 19 show the distribution of the mechanism that led to the injury for children 1 to 4, 5 to 9, and for boys 10 to 14 and girls 10 to 14. The distributions were similar for boys and girls in the two younger age groups but not for those 10 to 14. Injuries involving motor vehicles and other road vehicle crashes were less prevalent in children 1 to 4 but still accounted for close to 15 percent of all injury hospitalizations in that age group. Poisonings accounted for 16 percent of injury hospitalizations in children 1 to 4 but were less than three percent of hospitalizations in the other age groups. From Figures 18 and 19 it is clear that suicide attempts become an issue in the 10 to 14 age group. Close to 27 percent of all injury hospitalizations for girls that age are related to a suicide attempt. People who make suicide attempts are at greatly increased risk for completing suicide at some point in their lifetime.

Figure 16. Distribution of Injuries Requiring Hospitalization for Children 1 to 4, Colorado, 2000-2002

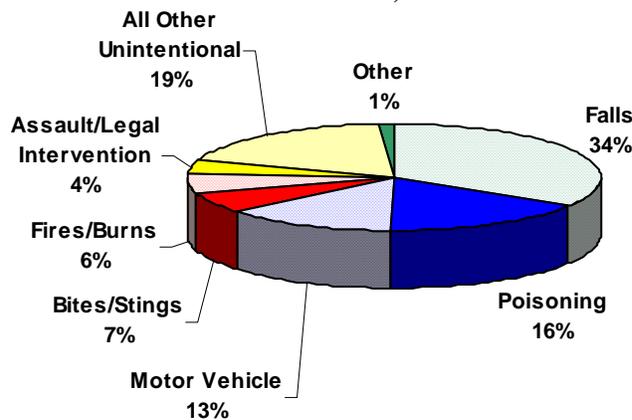


Figure 17. Distribution of Injuries Requiring Hospitalization for Children 5 to 9, Colorado, 2000-2002

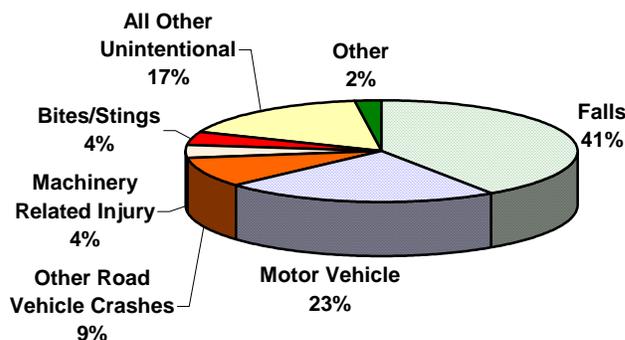


Figure 18. Distribution of Injuries Requiring Hospitalization for Male Children 10 to 14, Colorado, 2000-2002

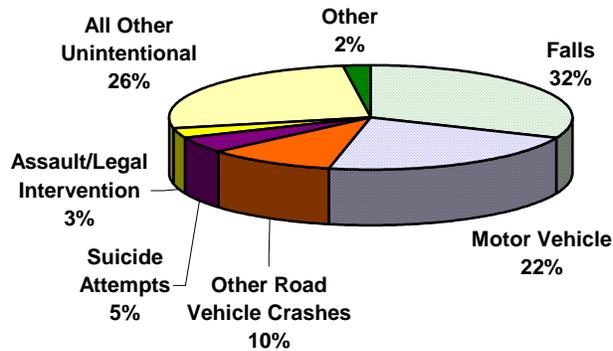
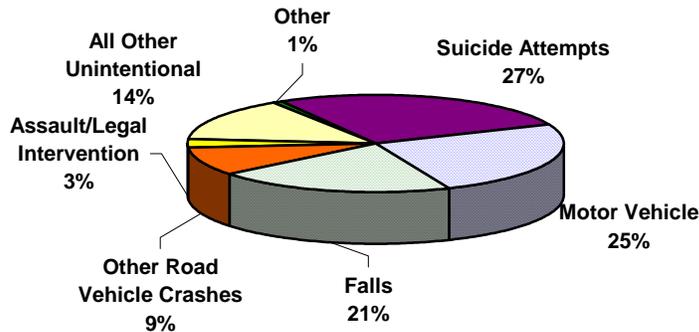


Figure 19. Distribution of Injuries Requiring Hospitalization for Female Children 10 to 14, Colorado, 2000-2002



One method of reducing motor vehicle traffic deaths among children is the proper use of child safety seats, booster seats and seat belts. When correctly installed and used, child safety seats reduce the risk of death in passenger cars by up to 71 percent for infants and 54 percent for children ages 4 years and younger. Children in booster seats (recommended for ages 4 to 8) are 59 percent less likely to be injured than those in seat belts only. (3)

Colorado’s booster seat law covers children ages 4 to 6 and less than 55 inches tall and went into effect August 1, 2003. For older children, seat belts are 45 to 60 percent effective in preventing fatal injuries. (3) The Healthy People 2010 objectives in this area are:

- Increase the use of safety belts to 92 percent of the population
- Increase the use of child restraints to 100 percent of those 4 and under.

Data from the Colorado Child Health Survey in 2004 indicate that 90 percent of children 1 to 14 always use some kind of restraint while riding in a vehicle. In 2001, a more comprehensive survey of child restraint use among 4 to 8 year olds was conducted by the Injury Epidemiology Program at the Colorado Department of Public Health and Environment. (3) Nearly 86 percent of adult respondents said that their 4 to 8 year old child always used a restraint; yet only 15 percent of the children surveyed used the appropriate booster seat. Thirteen percent used a child car seat. Almost 14 percent were reported to use a lap belt only as their restraint system, while 56 percent used a lap and shoulder belt. (4)

An observational study of child restraint use from December 2000 to 2002 in Colorado Springs, where there had been extensive public health promotion of booster seat use, found that most children (75 to 88 percent) were restrained in some manner. A total of 42 percent of the children who were restrained were using booster seats, higher than the figure given for the statewide survey. (4) In this observational study, the authors found that the driver's use of seat belts was related to the child's use; 99 percent of children observed in vehicles in which the driver wore a seatbelt were restrained compared to 44 percent of children restrained in vehicles in which the driver was not wearing a seatbelt. (4)

Child Abuse and Neglect

Assault or homicide is the third leading cause of death for children age 1 to 9. Federal law defines child abuse and neglect at a minimum as:

- any recent act or failure to act on the part of a parent or caretaker which results in death, serious physical or emotional harm, sexual abuse or exploitation; or
- an act or failure to act which presents an imminent risk of serious harm.

Child maltreatment is comprised of four major categories: neglect, physical abuse, sexual abuse, and emotional abuse. The Healthy People 2010 goal is to decrease child maltreatment to 10.3 confirmed and unique cases per 1,000 children under the age of 18. While Colorado met the national objective with a 7.4 rate in 2003, it appears that the rate of child maltreatment may have increased in the state since 2001. (5) The rate was previously reported as 4.3 confirmed cases per 1,000 children in that year. (6) Since 2001, a methodological change in the way the rate is calculated in Colorado, counting each child as one case instead of each incident (which might include more than one child) as one case, contributed to the increase, but does not explain the entire change. In 2001, Colorado was one of seven states to have had child maltreatment rates of 6.0 or less per 1,000 children.

Children ages 1 to 4 have higher rates of hospitalization for injuries due to assaults than those 5 to 9. The three-year rate of injury hospitalizations due to assault for Colorado children age 1 to 4 was 7.3 per 100,000 children in 2000-2002. This was down from the rate of 11.3 in 1997 to 1999. During these same time periods, children age 5 to 9 had hospitalization rates for assault of 2.4 and 2.2 per thousand. There were no differences in the rates for boys and girls.

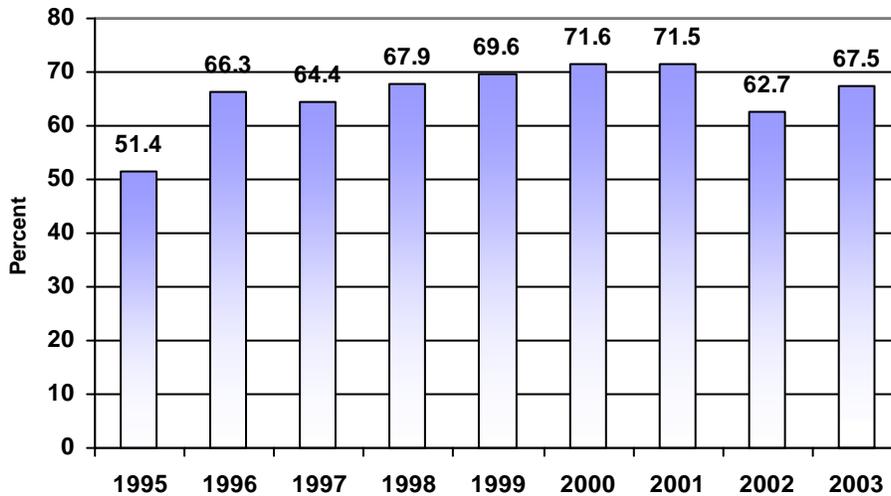
Immunizations

For immunizations, the Healthy People 2010 objective is to achieve and maintain effective vaccination coverage levels at 90 percent for universally recommended vaccines among young children. For children 19 to 35 months of age the recommended coverage is the 4:3:1:3:3 series:

- 4 DTaP – Diphtheria and tetanus toxoids and acellular pertussis vaccine
- 3 Polio
- 1 MMR – Measles, mumps, and rubella vaccine
- 3 Hib – Haemophilus influenza type b conjugate vaccine
- 3 HepB – Hepatitis B vaccine. (7)

Data from the National Immunization Survey document that Colorado has not reached that objective. According to the 2003 survey, 79.4 percent of children age 19 to 35 months in the United States had completed this series, while 67.5 percent of Colorado children had done so. (8) The Colorado rate was the lowest rate found in the survey, which is a random telephone survey of households with children. Figure 20 shows the estimated vaccination coverage of this series for Colorado children 19 to 35 months of age from 1995 through 2003. Vaccination coverage increased from 51.4 percent of all children having complete coverage in 1995 to a significantly higher 71.6 percent in 2000. Since that time the percent of children immunized has stayed the same or decreased.

Figure 20. 4:3:1:3:3 Estimated Vaccination Coverage Among Colorado Children 19-35 Months, National Immunization Survey, 1995-2003



Many factors could be contributing to Colorado not reaching the 2010 objective. When looking at individual vaccines, from 1995 to 2003, over 85 percent of children were up to date on the individual antigens with the exception of HepB and the 4th DTaP. One factor for the decline in complete vaccination coverage in the more recent years could be the fact that there was a shortage of the DTaP vaccine in 2001. Because of the shortage, the fourth and fifth shot in the series was suspended and the vaccine was allocated to younger children for the first 3 shots in the series. However, the Centers for Disease Control and Prevention (CDC) cautions that more analysis is needed to understand what, if any,

impact the shortage may have had on vaccination coverage levels, since a similar decrease was not seen at the national level. (8)

Health Status and Asthma

Children 1 to 14 are generally thought to be in good health. A total of 86 percent of the children in the Colorado Child Health Survey sample were reported to be in excellent or very good health and 4 percent were said to be in fair or poor health. However, asthma is one disease of serious concern. Asthma is a chronic respiratory disease characterized by episodes or attacks of inflammation and narrowing of small airways in response to asthma “triggers.” Asthma attacks can vary from mild to life threatening and involve shortness of breath, cough, wheezing, chest pain or tightness, or a combination of these symptoms. Many factors can trigger an asthma attack, including allergens, infections, exercise, tobacco smoke, abrupt changes in the weather, or exposure to other airway irritants. National statistics have shown that the number of children with asthma more than doubled between 1980 and 1995, with rates for children under 5 years old increasing over 160 percent during the same period. (9)

The 2001 National Health Interview Survey (NHIS) estimated the prevalence of ever being diagnosed with asthma at 126 children per 1,000 aged 0 to 17, and the current prevalence of asthma at 87 per 1,000 children age 0 to 17. (9) Results from the 2003 NHIS estimated the rate of experiencing an asthma episode in the past 12 months was 54.4 per 1,000 children age 0 to 14. For children under age 15 years, the sex-adjusted rate of having an asthma episode during the past 12 months was higher among non-Hispanic Black children than among Hispanic or non-Hispanic White children. Children had significantly higher asthma prevalence rates than those 15 to 34 and those 35 and older. (10) Data from the 2004 Colorado Child Health Survey show that 12.5 percent of the sample aged 1 to 14 had ever been diagnosed with asthma and 8 percent currently have asthma. With the advent of this survey, Colorado should have better surveillance data to track not only the prevalence of the disease but the severity as well.

Physical Activity and Nutrition

There is much concern about the increasing prevalence of overweight in children and adolescents. Overweight and obesity acquired during childhood or adolescence may persist into adulthood and increase the risk for some chronic diseases later in life. The national objective is to reduce overweight to not more than 5 percent of children age 6 to 19. The measurement used is the gender- and age-specific 95th percentile of body mass index (BMI) from the revised Centers for Disease Control and Prevention (CDC) Growth Charts for the United States.

The National Center for Health Statistics, using data from the National Health and Nutrition Examination Survey, estimated that 11 percent of children in the nation were overweight in 1990 and 15 percent were overweight in 2000. (11) Based on data from the Colorado Child Health Survey, 14.8 percent of the sample ages 2 to 14 would be considered overweight. Healthy People 2010 stresses that reduction in BMI among children and adolescents should emphasize a properly balanced diet and physical activity.

In order to promote a properly balanced diet, two nutritional Healthy People 2010 objectives for the nation include:

- Increasing to 75 percent the proportion of all those 2 and older who eat 2 servings of fruit a day.
- Increasing to 75 percent the proportion of all those 2 and older who eat 3 servings of vegetables a day.

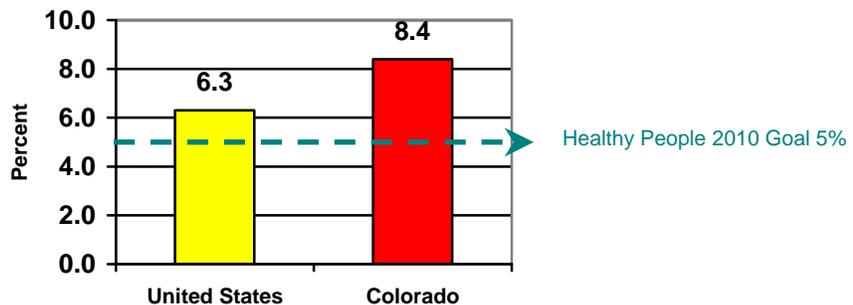
Data from the Child Health Survey indicate that 37 percent of Colorado children eat 2 or more servings of fruit a day, not including fruit juice, while 5 percent eat 3 or more servings of vegetables. Eighty-nine percent of parents said that it was “very important” for schools to provide an environment that encourages healthy food choices; 70 percent said that it was “very important” for schools to limit the availability of high sugar and high fat foods such as soft drinks, cookies, and chips.

Insufficient physical activity is a risk factor for being overweight and for having many related chronic diseases; regular physical activity is associated with immediate and long-term health benefits. Active children are more likely to become active adults. (12) Several national health objectives aim to increase levels of physical activity and reduce sedentary behavior. Most of these address issues for adolescents since this is the time when physical activity starts to decrease. (12) (See Adolescent Health Section.) However, it is important to promote physical activity in the earlier ages as well. The American Heart Association recommends that children and adolescents participate in at least 60 minutes of moderate to vigorous physical activity every day. (13) To promote a healthy, more active lifestyle among U.S. children, the Centers for Disease Control and Prevention developed the Youth Media Campaign, a national initiative to encourage children in the middle school years, age 9 to 13, to engage in and maintain high levels of regular physical activity. To estimate baseline levels of physical activity in this age, the Youth Media Campaign Longitudinal Survey, a nationally representative survey of children 9 to 13 and their parents, was first conducted in 2002. From these data it was estimated that in any 7-day period of time 61.5 percent of children in this age group did not participate in any organized physical activity during their non-school hours and that 22.6 percent did not engage in any free-time physical activity. (12) While boys and girls were just as likely to participate in organized physical activity, girls were less likely to participate in free-time physical activity during the preceding 7 days than boys (25.9 percent as compared to 19.5 percent). Participation in organized physical activity, but not participating in free-time physical activity, increased with increasing levels of parental education and income. The major barrier to participation in physical activity for children 9 to 13, as reported by parents, was the expense in getting their children involved. (12)

The Colorado Child Health Survey asks several questions about physical activity. In 2004, 60 percent of children 5 to 14 participated in a sports team either in or out of school. Over half (53 percent) of children 1 to 14 watched television, including videos, more than two hours a day. Ninety-four percent of parents surveyed thought that physical education should be required in schools in every grade. Seventeen percent of children walked to school on a regular basis five days a week, while three percent rode their bikes.

While overweight and lack of physical activity are of concern, another nutritional issue on the other side of the continuum is that of growth retardation. Retardation in linear growth in preschool children serves as an indicator of overall health and development and also may reflect the adequacy of a child’s diet. Full growth potential may not be reached because of less than optimal nutrition, infectious diseases, chronic diseases, or poor health care. Inadequate maternal weight gain during pregnancy and other prenatal factors that influence birth weight also affect the prevalence of growth retardation among infants and young children. (1) The Healthy People 2010 objective for the nation is to reduce growth retardation among low income children to 5 percent, which would be the naturally occurring incidence of children on the low end of the growth curve. National and state estimates of growth retardation are developed using data from the Pediatric Nutrition Surveillance System, a child-based public health surveillance system that monitors the nutritional status of low-income children in federally funded maternal and child health programs. (14) Based on these data, 8.4 percent of Colorado’s low-income children less than 5 years old would be considered short stature in 2002 (Figure 21). That is, based on the 2000 CDC growth reference, 8.0 percent of this population in Colorado is below the 5th percentile for length-for-age for children younger than age 2 and height-for-weight for children aged 2 or older. Nationally, 6.3 percent of low-income children younger than 5 were short stature in 2002. (14)

Figure 21. Percent of Low-Income Children with Short Stature, Colorado and the United States, 2002



Environmental Exposures with Adverse Health Effects

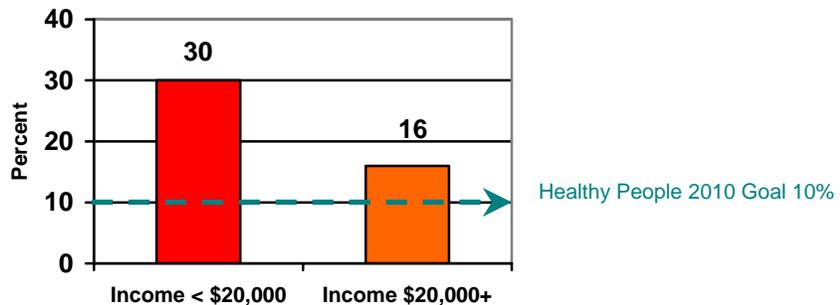
One environmental exposure of great concern is secondhand smoke. Secondhand smoke – also called involuntary smoking, environmental tobacco smoke or passive smoking – is a combination of smoke in the air from a burning cigarette, cigar or pipe, and the smoke exhaled by a person who is smoking. Secondhand smoke contains more than 4,000 chemicals, including arsenic, formaldehyde, hydrogen cyanide and radioactive elements. More than 50 of these chemicals have been identified as carcinogens. (15) Like asbestos, secondhand smoke has been classified as a “Group A” carcinogen by the U.S. Environmental Protection Agency. Secondhand smoke causes an estimated 53,000 deaths annually in the United States, including 3,000 lung cancer deaths, more than 2,000 SIDS deaths and more than 35,000 deaths from coronary heart disease. (16)

Young children are particularly susceptible to secondhand smoke because their lungs are not fully developed. Exposure to secondhand smoke is associated with an increased risk

for sudden infant death syndrome (SIDS), asthma, bronchitis, ear infection, and pneumonia in young children. (15)

The Healthy People 2010 objective in this area is to reduce the proportion of children who are regularly exposed to tobacco smoke at home to 10 percent. A question on whether smoking was allowed in the home was included in the Colorado Behavioral Risk Factor Surveillance Survey in 2000, 2002, and 2003. From this survey, it was estimated that 18 percent of households with children allow smoking in the home. Those with household incomes of less than \$20,000 a year were significantly more likely to allow smoking in the home compared to households with incomes over \$20,000 (30 percent as compared to 16 percent, Figure 22).

Figure 22. Percent of Households with Children Allowing Smoking in the Home by Income Level, Colorado, 2000, 2002, 2003



Data from the Colorado Child Health Survey indicate that 7 percent of households with children 1 to 14 had someone smoking in the house in the last week; 5 percent of households had adults who were smoking every day in the house. These estimates may underestimate the true level of smoking since the BRFSS data show that 18 percent of households permit smoking.

Another environmental hazard that has become a concern for children in recent years is exposure to the production of crystal methamphetamine. Children of methamphetamine manufacturers suffer burns, respiratory problems, toxic blood levels, neglect and abuse. (17) Colorado, like many states in the West, faces a significant problem of clandestine methamphetamine drug manufacturing. The number of seizures of methamphetamine drug laboratories continued to rise in Colorado from 31 laboratories in 1998 to 455 in 2001. (18) In 2003 there were 364 such seizures. (19) It is estimated that for every one clandestine lab discovered another ten exist but are not found.

In 2003, 90 children were present in the labs at the time of the seizure. Law enforcement agencies estimate that 35 percent of all clandestine labs are places where children live. (18) In the past the agencies have only counted the number of children that are present at the time of the raid rather than children who may be involved but are not present at that time, e.g., at school. Reporting will now include all children who are affected by such a lab. In future years, the true numbers of children involved will be measured.

Health and Safety in Child Care

With nearly 60 percent (over 200,000) of all children under six living in households where their single parent or both their parents are in the workforce, quality early care and education programs are critical to the development, health and safety of infants and children. (20) A healthy and safe environment is a significant and basic component of providing quality early care and education. The health and safety of children in out-of-home child care settings depends on the prompt dissemination of new information, training of child care professionals to implement health and safety standards, and advocacy efforts that strengthen existing state and local health and safety regulations.

In the Healthy Child Care Colorado 2002 Outcome Evaluation, child care health consultants and child care directors agreed on seven impacts that are associated with health and safety consultation to child care centers. These include reducing child sick days and staff sick days; adopting universal precautions; improving immunization rates and immunization recordkeeping, screening and referral of children, and increased knowledge on the part of parents and staff about when to keep a sick child home. However, there are no standardized methods currently being used to measure health and safety in child care centers across the state.

Summary

The leading cause of death for children is unintentional injury. While Colorado's rates of unintentional injury are lower than the U.S. rates for young children, they are higher for young adolescents, and suicide is a cause of death that becomes noticeable in that age group. The major cause of unintentional injury deaths is injuries due to motor vehicle crashes. Homicide was the leading cause of intentional injury deaths among children under 10.

Boys have higher rates of injury mortality and injury hospitalization than girls. Injuries sustained in falls are the most prevalent type of injury that requires hospitalization. Injury death rates and injury hospitalization rates have fallen substantially since 1995.

Most children are restrained while riding in a vehicle. Booster seat use for young children is not widespread, but a new state law was enacted in 2003.

Colorado was one of seven states in 2001 to have low child maltreatment rates that met the Healthy People 2010 goal, but the rate rose between 2001 and 2003, and no longer meets the goal.

About two out of every three children age 2 are appropriately immunized in Colorado. This proportion is considerably lower than the 90 percent goal set for Healthy People 2010.

Asthma is a serious health issue, and an estimated one in twelve children in the state currently suffers from the disease. In addition, a growing proportion of children are overweight or are at risk for overweight. Data from the 2004 Colorado Child Health Survey indicate at least one out of every seven children age 2 to 14 is overweight.

Insufficient physical activity is a risk factor for overweight, and half of children watch more than two hours of television a day. Sports activities at schools may be limited.

One in every 12 low income children has a short stature and fails to meet minimum height or length for weight standards. This problem is not well recognized. Surveys also show that almost one in five children live in households where smoking is allowed in the home.

A large majority of children under age six are cared for outside the home while their parents work. Health and safety in child care is a critical issue impacting the health of over 200,000 children in the state.

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Adolescent Health

Adolescence is usually thought of as a time of healthy well being and energy. The mortality rate during this time is low compared to adult populations and to rates during infancy. Yet several issues put teenagers at risk for immediate morbidity and mortality such as injury due to motor vehicle crashes and exposure to sexual transmitted diseases. Other behaviors begun in adolescence have far reaching effects on the development of chronic disease in later life. These include smoking, diet, and physical activity. Teen pregnancy is also a health issue for this population as well as the infants born to teen parents. Thus, it is important to monitor health outcomes and health related behaviors in order to develop priorities for health education and health intervention programs for this age group.

Health outcomes are monitored by use of hospital discharge and birth and death certificate data. Health related behaviors among adolescents in Colorado have been measured using three different surveys: the Colorado Youth Risk Behavior Survey, the Colorado Youth Tobacco Survey, and the Colorado Youth Survey.

The Colorado Youth Risk Behavior Survey (YRBS) is part of a bi-annual national and state survey monitoring key health-risk behaviors among adolescents attending public high schools. The Centers for Disease Control and Prevention developed the survey and administers it to a nationally drawn random selection of high schools. In Colorado, the Department of Public Health and Environment conducts the survey. Colorado has been participating in this effort since 1995. However, since 1997 the Colorado survey has had a lower than desired response rate and thus the results cannot be generalized to all public high school students. This makes comparing differences in years and with the national data more tenuous. Yet, the data, if used cautiously, can still provide crucial information for tracking the health status of Colorado teens. The national survey is considered to be a representative sample of United States adolescents.

The Colorado Youth Tobacco Survey (YTS) was conducted in 2001 and 2003 to collect data on youth tobacco use among 6th through 12th graders. The survey was developed by the Centers for Disease Control and Prevention and administered by the Colorado Department of Public Health and Environment. The survey was administered in a randomly selected sample of public middle and high schools throughout the state. In 2001 the results are thought to be representative of public school students in those grades. Findings from the Colorado survey can be compared to data from the National Youth Tobacco Survey. The 2003 survey had less than an adequate response rate to be considered a representative sample.

The Colorado Youth Survey (CYS) focuses on health risk behaviors among youth in grades 6, 8, 10, and 12, related to violence and tobacco, alcohol and other substance use. The survey is coordinated by the Alcohol and Drug Abuse Division of the Colorado Department of Human Services. The survey is offered across Colorado, but because school participation is strictly voluntary, a sample that is representative of the entire state

has not been possible. Thus, the same caution used in generalizing the results of the YRBS should be used with the CYS.

A fourth survey, Colorado Pregnancy Risk Assessment Monitoring System (PRAMS) includes a sample of teen mothers. (See Pregnancy and Prenatal Care for more detailed information on PRAMS.) Information on health and behavior during pregnancy is gathered from these data.

Injury

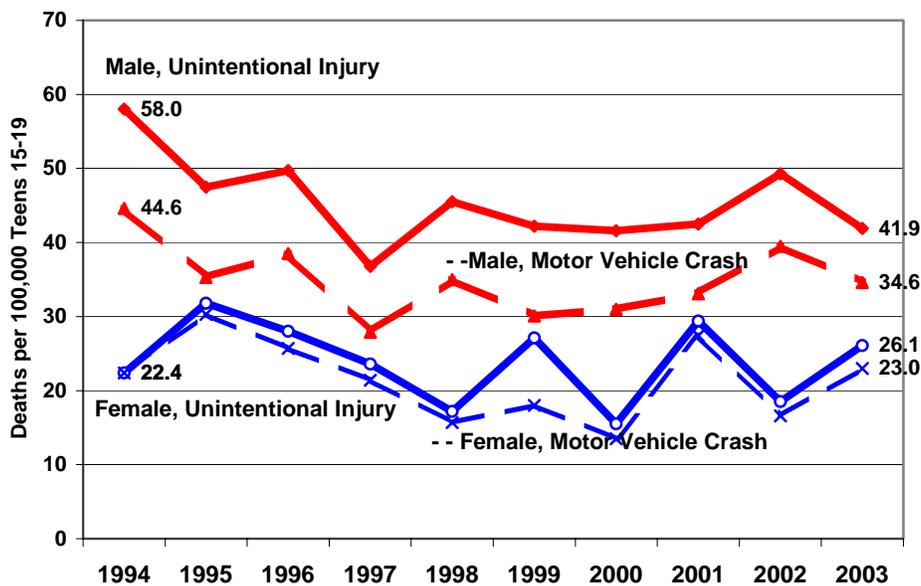
Injury is a significant problem for adolescents. Injury is the leading cause of death for adolescents and this age group has a higher rate of injury hospitalization than any other age group under age 65. (1) Injury is classified by the intent of injury, i.e. unintentional and intentional injuries.

Unintentional Injury

Unintentional injury (such as motor vehicle crashes, falls, drowning, etc.) is the leading cause of death for youth 10 to 19 years of age in Colorado, accounting for 54 percent of all deaths to 15 to 19 year olds from 1999 through 2003. Motor vehicle crashes remain the number one cause of unintentional injury deaths, and account for 78 percent of all unintentional injury deaths from 1999-2003 for 15 to 19 year old teens. Motor vehicle crashes include crashes involving motor vehicles and motorcycles, in addition to incidents in which a motor vehicle hits a bicyclist or pedestrian.

There has been a decrease in unintentional injury deaths from 40.8 per 100,000 teens in 1994 to 34.3 in 2003. Death rates due to motor vehicle crashes have also decreased during this time from 33.9 to 29.0. Figure 23 provides data by sex, and shows that males

Figure 23. Unintentional and Motor Vehicle Crash Death Rates for Colorado, Age 15-19 by Sex, 1994-2003



have higher rates of both unintentional deaths and motor vehicle crash deaths than females in this age group. When viewing these rates over time, it is important to remember that the coding of such deaths changed slightly in 1999 with the advent of ICD-10 (see Child Health Section). Thus rates prior to that year may not be strictly comparable to those in 1999 and after.

These death rates vary not only by sex but also by rural and urban residence. Death rates from unintentional injury and from motor vehicle injury are higher in rural than in urban areas of the state. For the period 1999-2003, over 65 percent of all deaths to 15 to 19 year-olds in frontier counties (fewer than 6 persons per square mile) and rural counties (no metropolitan area of at least 100,000 and no city with at least 50,000) were due to unintentional injury, compared to about half in urban areas. Table 5 gives death rates for unintentional injury and motor vehicle crashes for frontier, rural, and urban counties. Frontier counties have the highest death rates due to unintentional injuries and motor vehicle crashes, although it is unknown if these differences are statistically significant.

Table 5. Five-Year Unintentional and Motor Vehicle Crash Death Rates for Frontier, Rural, and Urban Areas of Colorado, Age 15-19, 1999-2003

Indicator	Frontier	Rural	Urban
Total Number of Deaths	60	189	813
Death Rate	121.3	90.8	60.2
Number of Unintentional Injury Deaths	40	123	379
Unintentional Injury Death Rate	80.8	59.1	28.1
Number of Motor Vehicle Deaths	33	103	297
Motor Vehicle Death Rate	66.7	49.5	22.0

Note: Death rates are per 100,000 teens.

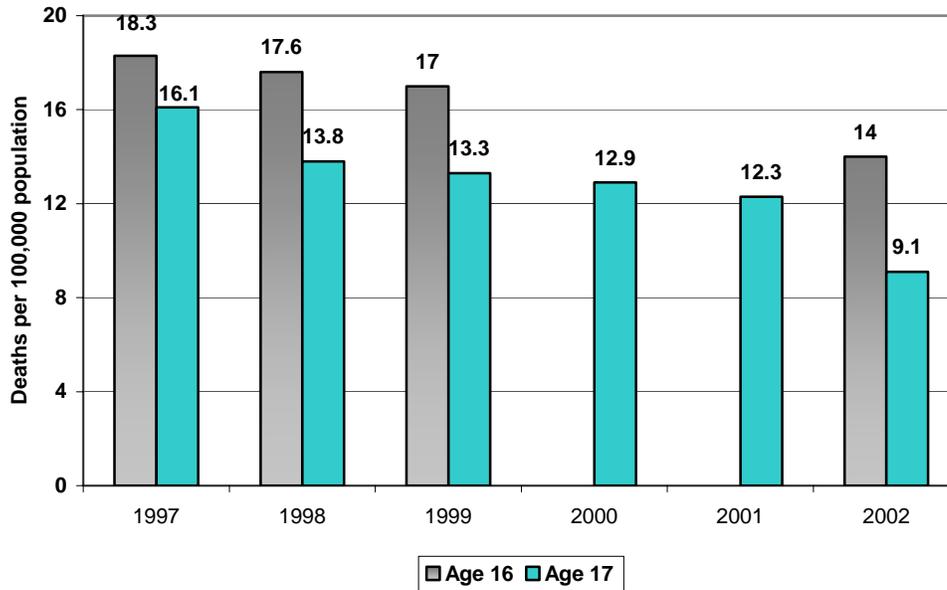
Being an adolescent driver or riding with an adolescent driver increases one's risk of being killed or injured in a motor vehicle crash. Motor vehicle crash rates for drivers 16 to 19 are higher than those for all other age groups, and 61 percent of all teenage passenger deaths occur when riding with a teenage driver. (2) The crash risk among 16 to 17 year old drivers is nearly three times as high as among 18 to 19 year old drivers. Two factors often mentioned to account for the high motor vehicle crash rates for young drivers are inexperience and risk-taking. (1) A recommended intervention is graduated driver licensing, where young drivers can gain experience under controlled conditions. Some graduated driver provisions pertaining to permits, licensing, driving at night and seatbelt use for 16 and 17 year olds went into effect in Colorado in 1999.

A study by the Injury Epidemiology Program at the Colorado Department of Public Health and Environment demonstrated the high injury risk for drivers 16 to 17. (2) Figures 24 and 25 show the death rates and hospitalization rates for motor vehicle crash injuries in Colorado for 16 and 17 year old drivers. Those 16 and older had a high of 18.3 driver deaths per 100,000 in 1997 which declined to a low of 14.0 in 2002. For 17 year olds, the highest rate was 16.1 in 1997 which dropped to 9.1 in 2002.

Hospitalization rates for motor vehicle crash injuries for 16-year-old drivers also decreased during this time from highs of 124.3 per 100,000 16 year olds in 1997 to 98.3 in 2002. Hospitalization rates for 17-year-old drivers did not vary much over these years.

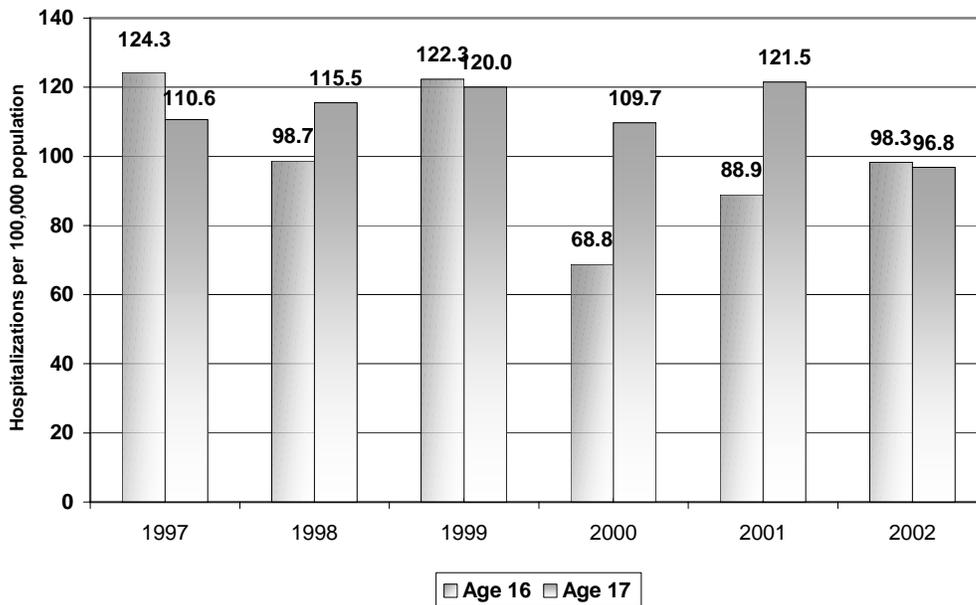
Due to the small number of deaths and hospitalizations for 16 and 17 year old drivers, any changes seen in the hospitalization rates were not statistically significant.

Figure 24. Motor Vehicle Driver Death Rates for 16 and 17 year olds, Colorado, 1997-2002



Note: No death rates calculated for age 16 in 2000 and 2001 due to small numbers.

Figure 25. Motor Vehicle Driver Injury Hospitalization Rates for 16 and 17 year olds, Colorado 1997-2002



Seatbelts are known to be 45 percent effective in reducing risk of fatal injury for adults. (3) For drivers age 16 to 17 who died in 2000-2002, 61 percent were unrestrained. (2) Healthy People 2010 has set the following objectives for the prevention of motor vehicle crash injury:

- Increase use of safety belts to 92 percent of the population
- Reduce to 30 percent the proportion of adolescents who report that they rode in the past 30 days with a driver who had been drinking alcohol.

Data from the Colorado YRBS gives some hope that seatbelt use among teens is increasing. The percent that reported “never” or “rarely” using seatbelts decreased from 22 percent in 1995 to 9 percent in 2003. Steady declines were evident in the years between: 21 percent in 1997, 15 percent in 1999, and close to 13 percent in 2001. Current data indicate that Colorado teens are approaching the Healthy People 2010 goal of 92 percent using seatbelts.

Another factor which contributes to adolescent deaths and injury due to motor vehicle crashes is drinking and driving. Teens were over represented among alcohol-related motor vehicle fatalities in 1997 through 2000. Over 12 percent of these deaths were to those 16-20, who make up only 7 percent of the population. (4) The percentage of students who report riding with a driver who had been drinking at some time during the past 30 days dropped from the 40 percent seen in 1995 and 1997 to 30 percent in both 2001 and 2003. This achieves the Healthy People 2010 goal regarding riding with drivers who have been drinking.

Intentional Injury

The other type of injuries, intentional injuries, are those due to self-harm or deliberate harm by others. Healthy People 2010 addresses these issues in the following objectives:

- Reduce the suicide rate to 5.0 per 100,000.
- Reduce the rate of suicide attempts by adolescents to 1 percent within a 12-month period.
- Reduce the average 2-year homicide rate among adolescents aged 15 to 19 to 5.0 per 100,000.
- Reduce the proportion of high school students who had been in a physical fight in the last 12 months to 29 percent.
- Reduce the proportion of high school students who carried a weapon on school property in the last 30 days to 5.5 percent.

Suicide

Suicidal behavior includes thinking about suicide, making plans for suicide, attempting suicide as well as death by suicide. While suicide statistics have generally focused on death rates from suicide, it is important to assess all suicidal behaviors among adolescents. Each at a minimum is a sign of distress that is itself important and at the other end results in significant morbidity and mortality.

Colorado has historically had higher rates of suicide than the national rate and in 2002 had the seventh highest rate of suicide among all 50 states. (5) From 1999 through 2003, suicide accounted for 17.7 percent of all deaths to adolescents, 15 to 19. Suicide death rates are higher for males than females and Colorado's suicide rates are higher than the national rates for male teens but not female teens for most years. Table 6 gives the national suicide rate for 15 to 19 year olds by gender for select years available from national data and compares those to the same death rates for Colorado teens of the same age.

Table 6. Colorado and United States Suicide Death Rates, Age 15-19 by Sex, Selected Years

Year	Males		Females	
	Colorado	U.S.	Colorado	U.S.
1995	22.3	17.1	3.1	3.1
2000	13.0	17.4	7.4	2.7
2001	20.1	12.9	1.9	2.7
2003	10.8	na	3.6	na

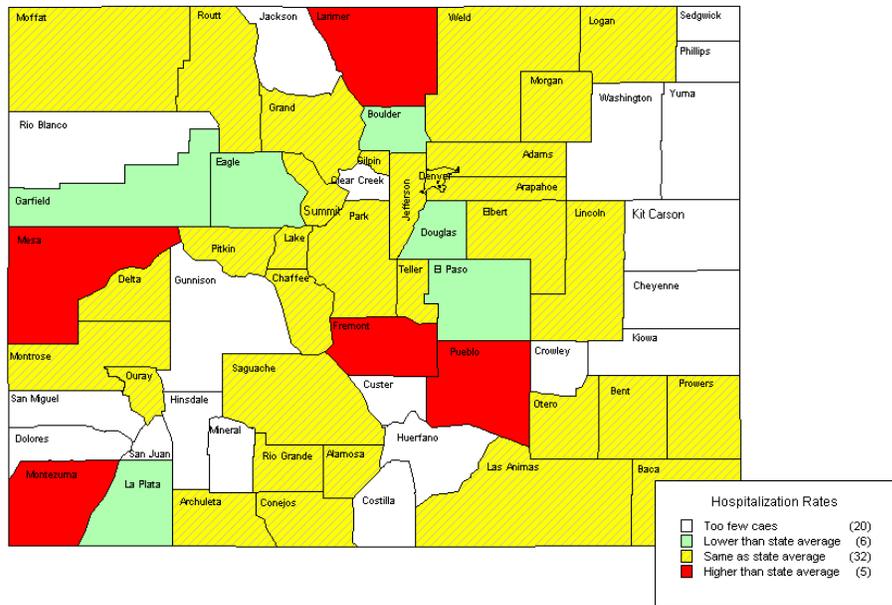
Note: Death rates are per 100,000 residents age 15-19

The suicide death rate for males in this age group dropped to 10.8 in 2003 in Colorado. The comparable death rate for females in 2003 was 3.6. Final data for 2003 are not currently available for the nation so it is unknown whether the decrease in suicide deaths seen in males in Colorado is similar to national rates. Overall in 2003, the suicide death rate for Colorado teens aged 15 to 19 was 7.3, still higher than the 2010 objective. It should be noted that the suicide death rate varies considerably from year to year.

Suicide attempts are another form of suicidal behavior, which are signs of distress that may result in injuries that contribute to morbidity and ongoing disability. Two sources of data exist about these suicidal behaviors: hospitalization due to suicide attempts and youth surveys about suicidal ideation and attempts. From 1998-2002 a total of 1,953 Colorado youth 15 to 19 were hospitalized due to injuries sustained in a suicide attempt, including a high of 132.1 hospitalizations per 100,000 adolescents in 1998 and a low of 118.8 in 1999. Hospitalization rates did not vary significantly by year over this 5-year period. While mortality rates from suicide are significantly higher for males, females aged 15 to 19 had over twice the rate of hospitalization from suicide attempts from 1998 to 2002 (170.6 for females compared to 83.7 for males). Thus, it is important to remember that significant suicidal behaviors are not just limited to adolescent males.

While the rural counties on average had the highest rates of hospitalization due to injury from suicide attempts, there was no significant difference in hospitalization rates based on counties classified by urban, rural, or frontier status. However, individual counties varied widely in their hospitalization rates. Map 4 shows the counties that have hospitalization rates for injury due to suicide attempts that are significantly higher, lower, or the same as the state rate of 124.5 hospitalizations per 100,000 residents. Five counties had hospitalization rates significantly higher than the state average and six had rates significantly lower, while 20 counties had too few suicide hospitalizations to estimate whether the rate would have been higher or lower than the state average.

Map 4. Rates of Hospitalization Due to Injury from Suicide Attempts by County of Residence, Age 15-19, 1998-2002

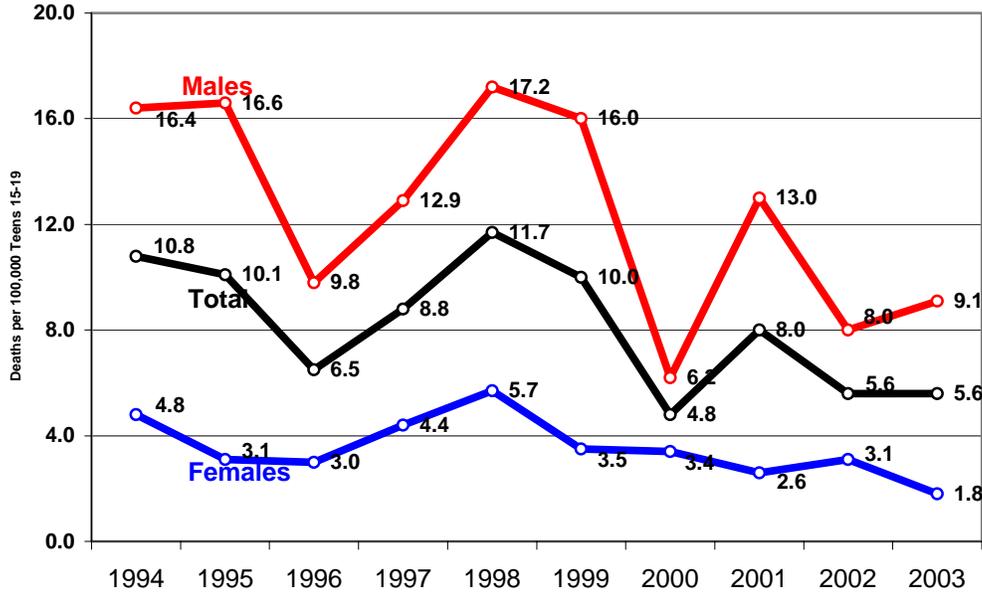


Results of the 2001 and 2003 Colorado YRBS indicate that between 26 percent and 31 percent of all teens surveyed reported that they had felt “so sad or hopeless every day for two or more weeks in a row” that they had stopped doing some usual activities. Approximately 19 percent of high school students surveyed had seriously considered attempting suicide in the past 12 months and 11 to 13 percent had made a suicide attempt during that time period. These results differed by sex with approximately one-fourth of the girls reporting seriously considering suicide and 15 percent attempting suicide.

Assault and Homicide

Homicides (deaths) and assaults (nonfatal injuries) are injuries purposely inflicted by another person with intent to kill or harm. (6) Since 1989 the age-adjusted homicide rate in Colorado has consistently been lower than the national rate. (1) While the homicide rate has been decreasing in recent years in both the nation and Colorado, ten percent of all deaths to those 15 to 19 from 1999 through 2003 were homicides. The homicide rate for Colorado teens was low compared to the national average; 9.4 per 100,000 nationally compared to 8.0 for Coloradoans 15-19. (7) As in mortality rates from suicide, adolescent males consistently show higher rates of death by homicide than their female counterparts. In 2003 the homicide rate was 9.1 per 100,000 males age 15-19 and 1.8 for females of the same age. Yet, while Colorado enjoys consistently lower rates of teen homicide than that of the nation, the state has not yet reached the Healthy People 2010 goal of 5.0 homicides per 100,000. Figure 26 shows that the rates are highly volatile from year to year, and that the decrease in the homicide rate since the 1990s has been due largely to the decrease in the rates among males. Female rates have historically been low and continue to be low.

Figure 26. Homicide Rates for Colorado Residents Age 15-19 by Sex, 1994-2003



Unlike suicide, hospitalizations due to assault or legal intervention show a preponderance of teen males. Over 84 percent of all hospitalizations for injuries due to assault to those 15 to 19 were to males. Unlike the male homicide rate, the hospitalization rate has remained steady from 1998 through 2002 with a five-year average of 87.0 hospitalizations for assault for 100,000 teen males. The five-year average for females was 17.7.

While deaths and hospitalizations measure severe injury due to assault, other behaviors suggest that Colorado teens continue to be at risk for these types of injuries. Based on 2001 and 2003 Colorado YRBS data, over 25 percent of males and 7 to 8 percent of females had carried a weapon in the last 30 days; 8 percent of males and 1 percent of females had carried a gun in that time. Over 7 percent of all students taking the survey reported carrying a weapon on school property in the last 30 days; close but still short of the Healthy People 2010 goal of 5.5 percent. One-third of students including 40 percent of male students had been in a physical fight during the last 12 months; again, short of the Healthy People 2010 goal of 30 percent.

Sixty percent of deaths from suicide and homicide result from the use of firearms as the mechanism of injury. From 1999 through 2003, 64 percent of all intentional injury deaths to males and 46 percent to females involved the use of firearms. Hanging is another mechanism of injury that results in death, accounting for one in every five male suicide deaths. Deaths due to firearms and hangings/suffocations result from the lethality of the methods used; hospitalizations, rather than deaths, are the more frequent result from other less lethal methods.

Teen Pregnancy and Sexual Behavior

A measurable decline in teen sexual activity in recent years signals a significant change in adolescent behavior. The reduction in sexual activity reduces exposure to the risk of pregnancy as well as to other serious health consequences such as sexually transmitted diseases. The percentage of high school students in the U.S. who reported ever having sexual intercourse declined from 53.1 percent to 46.7 percent between 1995 and 2003. A decline also occurred among those who were currently sexually active, from 37.9 percent in 1995 to 34.3 percent in 2003. (8)

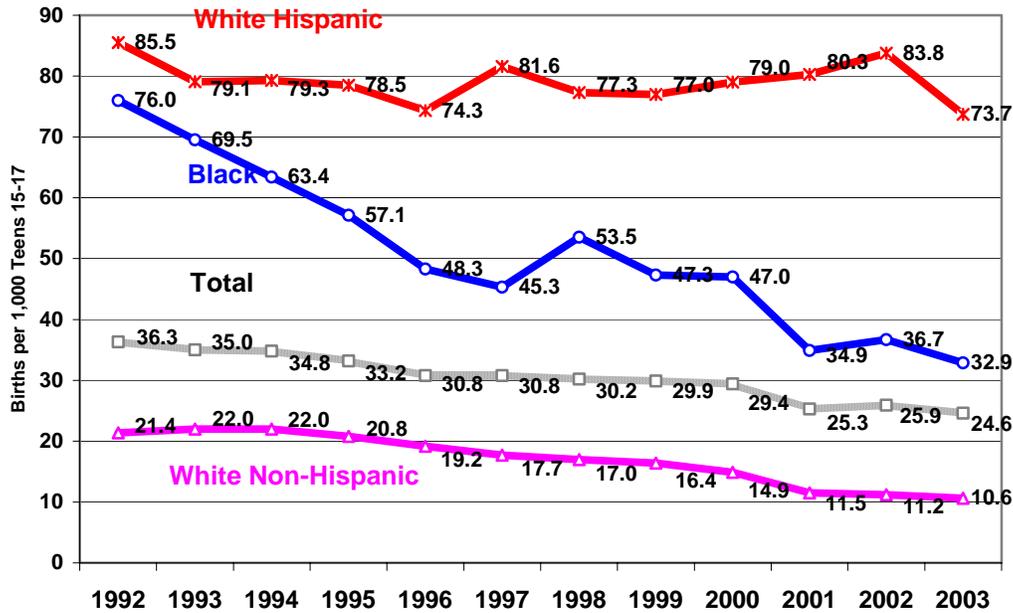
In Colorado in 1995, 47 percent of students reported ever having sexual intercourse; this percentage dropped to 42 percent in 2001 and 39 percent in 2003. These differences may reflect differences in the samples studied because the 2001 and 2003 Colorado YRBS surveys were not random samples of all high school students, yet they suggest a decline in the proportion at risk. In 1995, 31 percent of students were sexually active, that is, they had had sexual intercourse within the three months prior to the survey. In 2001 the comparable figure was 29 percent and in 2003 it was 28 percent. The Healthy People 2010 goal is for 75 percent of 15 to 17 year-olds to remain abstinent and for 90 percent to practice “responsible sexual behavior.” Ninety percent of high school students surveyed in Colorado in 2003 were practicing responsible sexual behavior, defined as those who had never had sexual intercourse, those who had had sexual intercourse but not within the last three months (currently abstinent), and those who used a condom the last time they had sexual intercourse during the three months preceding the survey. (9)

While the decline in sexual activity is a positive trend, early initiation of intercourse and pregnancy at an early age remain as serious health issues for some teens. Young women under 18 are at increased risk for poor pregnancy outcomes compared to their older counterparts. Births to teens are also of concern because teen mothers are less likely to complete high school, and their children are at increased risk for a variety of negative health and educational outcomes. Based on information from Colorado PRAMS, approximately 72 percent of all births to teens 15 to 19 from 1998 to 2002 were unintended. The Healthy People 2010 goal in this area is to reduce pregnancies among adolescent females to 43 pregnancies per 1,000 adolescent females. (10) This goal includes pregnancies that result not only in live births, but induced and spontaneous abortions and fetal loss as well. The National Center for Health Statistics estimates that 50 percent of all teen pregnancies result in a live birth. (11)

Due to the difficulty in accurately measuring both abortions and fetal loss, the data commonly used is limited to births, and birth certificates are used to calculate age-specific fertility (birth) rates. An age-specific fertility rate is the number of live births in an age group per 1,000 women in the population for that age group.

Nationally and in Colorado the fertility rate for 15 to 17 year olds has been dropping over the past decade. (12) In 2002, the most recent available data, the national fertility rate for girls 15 to 17 was at its lowest at 23.2 per 1,000 girls aged 15 to 17; this is down from 37.5 in 1990. (11) In 2002, 35 states had lower teen fertility rates than Colorado. (13) Figure 27 on the next page shows that the Colorado teen fertility rate has been dropping among all major racial and ethnic teen populations. Overall, the age-specific fertility rate

Figure 27. Teen Fertility Rates by Race/Ethnicity, Age 15-17, Colorado, 1992-2003



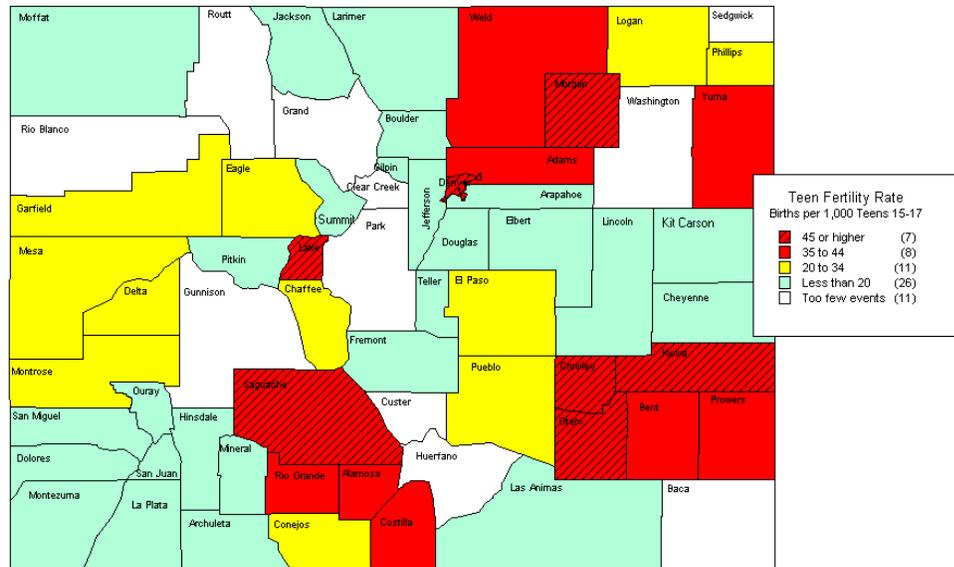
fell from a high of 36.3 births per 1,000 young women in 1992 to a low of 24.2 in 2003. However, the fertility rate for 15-17 year olds of Hispanic origin remains high, at 73.7 in 2003, a level more than double any other group. In fact, the fertility rate of 131.1 in 2000 for Hispanic teens who were themselves born outside the U.S. is double the 64.8 rate of Hispanic teens who were born in the United States (not shown). A sharp decline in black fertility early in the period has moderated, but the 32.9 rate in 2003 is the lowest ever achieved, and is lower than the total rate for all race/ethnicities in 1992.

An increase in the use of contraception among teens who are sexually active has taken place over the past decade. In Colorado in 1995, 53 percent of high school students surveyed used a condom at last intercourse. In 2001 the comparable rate was 67 percent, and in 2003 it was 68 percent. In addition, in 1995, 18 percent of high school females surveyed who were sexually active were using birth control pills. In 2003, 21 percent of female students were using birth control pills and an additional 8 percent were using an injectable contraceptive (e.g., Depo-Provera). While the 2001 and 2003 surveys were not representative samples of all Colorado high school students, they suggest higher rates of contraceptive use compared to 1995.

Map 5 provides the range of teen fertility rates for 2003 by county. Estimating reliable rates for a one-year time period is difficult in some counties with small populations and a small number of births; there were 11 counties for which teen fertility rates could not be reliably estimated. Out of the remaining 52 counties (no data were available for Broomfield), over half the counties (27) had rates below 20 births per 1,000 15 to 17 year old girls. However, some counties had teen fertility rates that were more than double this level. Seven counties had rates of 45 or higher births per 1,000 girls 15 to 17 (shown with

line shading in the map). A total of 15 counties had rates of at least 35 births per 1,000 teens. While reducing teen births statewide is needed, special efforts need to focus on those areas of the map that appear in red.

Map 5. Teen (15-17 years old) Fertility Rate by County, Colorado 2003



Health Behaviors for a Lifetime

Given the decrease in teen fertility rates, motor vehicle mortality rates, and suicide rates, adolescents now may be thought of as the healthiest group ever. Yet some behaviors started in adolescence could lead to problems with chronic disease in later life. These include smoking, lack of regular physical activity and poor eating habits. The Healthy People 2010 goals in this area include the following:

- Reduce the percent of adolescents in grades 9 to 12 who smoked cigarettes one or more days in the past 30 days to 16 percent
- Reduce the percent of overweight or obese children and adolescents who are at or above the sex- and age-specific 95th percentile of Body Mass Index (BMI) to 5 percent
- Increase the percent of adolescents in grades 9 to 12 who engage in 20 minutes of more of vigorous activity 3 or more days per week to 85 percent.
- Increase the proportion of adolescents who view television 2 or fewer hours on a school day to 75 percent
- Increase the proportion of adolescents who participate in daily school physical education to 50 percent.

Tobacco Use

The Campaign for Tobacco Free Kids estimates that every day more than 4,000 children under 18 try smoking for the first time and over 2,000 become daily, regular smokers. (14) They estimate that of the 750,000 children who become new smokers every year, almost one-third will die from smoking related diseases. Preventing tobacco use among

youth is critical to ensuring healthy adults, because tobacco use and subsequent addiction most frequently take root in adolescence. The current best estimate for the percentage of current smokers, i.e., those having smoked at least one cigarette in the last 30 days, among Colorado’s 9th through 12th graders, is 21.9 percent. This estimate is based on the unweighted results of the 2003 Colorado Youth Tobacco Survey (YTS). This seems to indicate a small decrease in the prevalence of current teen smokers since 2000. In that year, the YTS estimated that 25.3 percent of high school students were current smokers. By comparison, the national estimate of prevalence stood at 28.5 percent based on the National YTS (conducted in 1999). In addition, the percentage of teens who are current smokers has decreased from the last half of the 1990s, when estimates (using the YRBS) were in the 34 to 37 percent range both nationally and for Colorado.

Overweight

Overweight teens face immediate health problems, such as high cholesterol, hypertension, Type 2 diabetes, insulin resistance, polycystic ovary syndrome, and emotional issues. Excess weight in adolescence carried into adulthood also predisposes youth for serious adult health risks such as coronary heart disease, stroke, gall bladder disease, some types of cancer and osteoarthritis of the weight-bearing joints. (15) In 1999, questions were added to the YRBS asking students to report their height and weight so that a body mass index (BMI) could be calculated to obtain a reasonable proxy of determining whether a student was overweight or at risk for becoming so. Those students who were at 85 percent to 95 percent on the growth chart were considered at risk for being overweight; those 95 percent and above were considered overweight. Table 7 presents the results of the Colorado YRBS compared to the national YRBS. Based on these data, it would appear that Colorado high school students have lower rates of being overweight than the national average, although the rates appear to have increased between 2001 and 2003. Despite having better rates than the United States as a whole, Colorado is a considerable distance from reaching the 2010 goal of limiting that proportion to 5 percent.

Table 7. The Percentage of High School Students Who Report a BMI Indicative of Being At Risk for Overweight and Overweight, Colorado and the United States, 2001, 2003

BMI Indicator	Colorado		United States	
	2001	2003	2001	2003
At Risk for Overweight	8.6%	10.9%	13.6%	15.4%
Overweight	7.1%	9.5%	10.5%	13.5%

Although the bottom line for weight gain is consuming more calories than one expends, multiple factors contribute to being overweight. Two are high calorie diets and lack of physical activity. As mentioned in the children’s health section, two Healthy People 2010 goals are to increase the proportion of everyone age 2 and older who eats 2 or more servings of fruit a day to 75 percent and 3 or more servings of vegetables to 50 percent. Based on the Colorado YRBS, Colorado teens fall far short of this goal. Only 19.1 percent of students had eaten five or more servings of fruits and vegetables per day

during the 7 days preceding the survey. In addition, only 64.0 percent of students reported they participated in sufficient vigorous physical activity; thus, falling short of the goal of 85 percent. This was down from the 70 percent who reported sufficient vigorous activity in 2001. Sufficient vigorous physical activity is defined as physical activity that made them sweat and breathe hard for 20 minutes on 3 of the 7 days preceding the survey.

Studies on how teens spend their time indicate that watching television and playing video or computer games constitute a main form of activity. (15) These preferences take time away from the possibility of engaging in any type of real physical activity.

Approximately 29 percent of students in 2001 and 33 percent in 2003 also reported that they watched 3 or more hours of television per day on an average school day.

Daily physical education, recess and extracurricular athletic activities increase adolescent participation in moderate to vigorous physical activity. They can help teens acquire interest and skills in various physical activities they can pursue as adults. Colorado is just one of two states that does not mandate physical education in public schools. (15) Since 1995, students taking part in the Colorado Youth Risk Behavior Survey have shown dramatic decreases in the proportion who attend physical education classes daily. From a high of 41 percent in 1995 and 1997, only 22 percent reported attending a daily class in 2003.

Substance Use

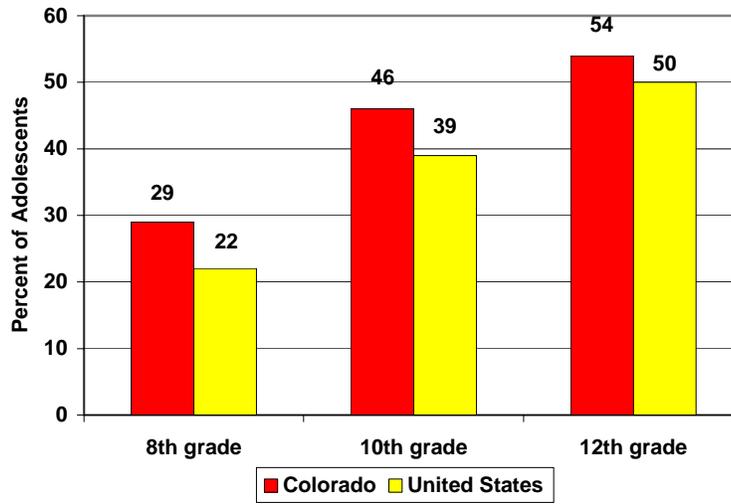
When adolescents use alcohol, other drugs, or substances such as inhalants, tranquilizers or hallucinogens, at best they compromise their ability to make safe choices and good decisions in their daily routines—whether it is relations with the opposite sex, dealings with peers, driving to the store, riding a bicycle or skiing down a hill. At worst, they can die or cause harm, even death, to someone else. Substance use cuts across race and ethnicity, geographic and socioeconomic lines. (15) Costs associated with use of alcohol alone by youth are over \$52 billion for medical expenses, the criminal justice system, loss of future earnings, property damage and lost quality of life. (15,16,17) In view of this, Healthy People 2010 has set the following objectives in this area:

- Reduce the proportion of high school students who had at least one drink of alcohol on one or more of the past 30 days to 40 percent.
- Reduce the proportion of youth who had five or more drinks of alcohol in a row, within a couple of hours, (binge drinking) on one or more of the past 30 days to 25 percent.
- Reduce the proportion of high school students who used marijuana in the past 30 days to 18 percent.

Substance use and abuse is of particular concern in Colorado. According to the National Technical Center for Substance Abuse Needs Assessments, Colorado ranks 5th among all states in an index measuring alcohol problems (18); it is not surprising that Colorado teens have higher alcohol use when compared to national data.

Figure 28 below indicates that at all grade levels, Colorado teens are more likely to consume alcohol than their national counterparts. These data are consistent with the latest Colorado YRBS data showing that 48 percent of the teens surveyed had had one or more alcoholic drinks in the past 30 days.

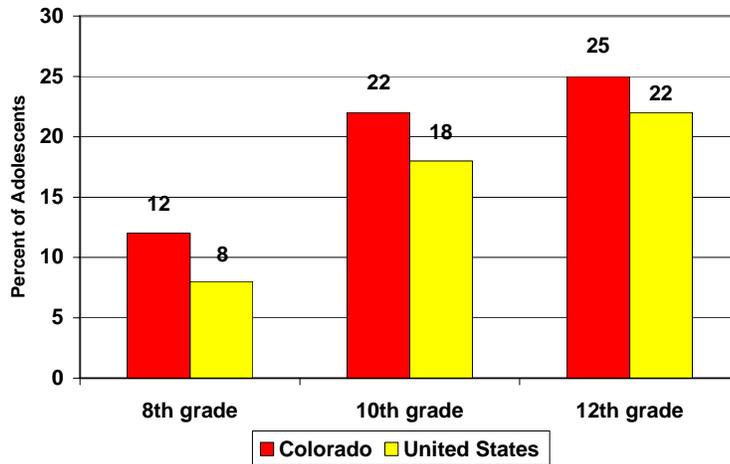
Figure 28. Percent of Adolescents Who Report Drinking Alcohol Within the Last 30 Days by Grade, Colorado and the United States, Colorado Youth Survey and Monitoring the Future National Survey on Drug Use, 2002



In addition to Colorado’s high ranking among all states on the alcohol problem index, Colorado is also 11th among all states in the prevalence of binge drinking among adults. (18) The percentage of students who report binge drinking, that is having 5 or more drinks in a row in a couple of hours, was 29 percent on the 2003 Colorado YRBS. (13) This is the same as the national figure reported by CDC for the same year. (11) Caution should be taken when comparing different years on the Colorado YRBS since only 1995 can be considered a representative sample of public high school students in the state. Yet, years before 2003 have shown higher rates of binge drinking. For instance, in 1999 42 percent of those surveyed reported binge drinking in the past month compared to 32 percent of the national sample. Such a dramatic decrease in binge drinking has not been noted in the national data; although the national data do show a decrease from 33 percent in 1995 to 29 percent in 2003. Better Colorado data are needed to assure that a decrease in binge drinking has occurred among the state’s teens.

According to the 2003 YRBS, close to half of all teens surveyed (48%) had ever used marijuana. Twenty-five percent used this drug within the last 30 days. This is somewhat higher than the national rate of 22 percent. Figure 29 shows that for each grade surveyed in the CYS, Colorado teens reported the same or higher use of marijuana compared to national data. This pattern is consistent with the 1999 and 2001 national and state surveys.

Figure 29. Percent of Adolescents Who Report Using Marijuana Within the Last 30 Days by Grade, Colorado and the United States, Colorado Youth Survey and Monitoring the Future National Survey on Drug Use, 2002



The next most commonly used drug by Colorado teens is cocaine. The 2003 Colorado YRBS reported that 13 percent of adolescents surveyed had ever used cocaine and that 7 percent had used it within the past month. On the national survey, close to 9 percent reported ever using any form of cocaine and 4 percent had used in the last month. The higher use by Colorado adolescents compared to the national data once more needs to be viewed with caution. It is unknown how similar the students taking the Colorado YRBS are to all Colorado teens.

In addition to the substance use, the Alcohol and Drug Abuse Division of the Colorado Department of Human Services estimates that 27,600 Colorado teens age 12 to 17 have a substance use problem. This age group, while making up 9 percent of the population, account for 11 percent of all estimated substance abusers/dependents statewide. (4)

Summary

Adolescence is usually thought of as a time of healthy well-being and energy. The mortality rate during this time is low compared to adult populations and to rates during infancy. Yet adolescents are at risk for behaviors that can have both immediate and long-term consequences.

Injury is the leading cause of death for adolescents. Unintentional injury, such as motor vehicle crashes, falls, or drowning, is the leading cause within all types of injury. Motor vehicle crashes remain the number one cause of unintentional injury deaths, and rates are highest among 16-year-olds. Although motor vehicle deaths have fallen since 1990, they have not improved since 1998. Teens in rural and frontier counties experience higher death rates than teens in urban areas. Seatbelt use has improved and alcohol use associated with driving has declined while some graduated licensing regulations have been adopted.

Suicide rates for male adolescents are high, and exceed the national rates by a large margin. Hospitalization for suicide attempts is high for both males and females, and nearly 2,000 adolescents in Colorado were hospitalized over the most recent 5-year period. Homicide rates in the state are lower than national rates, and have declined substantially in recent years, but they do not yet reach the Healthy People 2010 goals.

Unprotected sexual intercourse puts many teens at risk for unintended birth. Colorado's rate of teen births dropped sharply between 1990 and 2003. The rate dropped in all racial and ethnic groups, with the most notable decline among Black adolescents, whose rate dropped by over 50 percent. However, rates among Hispanic teens, both for those born in the U.S. and those born outside the U.S., remained markedly higher than for other teens. In 2003, 90 percent of high school students surveyed were practicing "responsible sexual behavior," defined as those who never had sexual intercourse, those who had had sexual intercourse but not within the last 3 months, and those who used a condom the last time they had sexual intercourse during the 3 months preceding the survey. An increase in contraceptive use and a decrease in the proportion of teens who are sexually active have both contributed to the overall decline in teen births.

Tobacco use continues to be a critical behavioral health issue for adolescents. Over one-quarter of teens are smokers, a rate that is higher than the national average. Overweight in this age group is also an issue of concern in the state, and rates of overweight and at risk for overweight are increasing. Although they are well below the overall national rates, they are double the Healthy People 2010 goals. Proper nutrition and adequate physical activity are areas that need improvement for this age group.

Substance use and abuse is of particular concern in Colorado which is ranked 5th among all states in an index measuring alcohol problems. Surveys reveal that about half of all teens have used alcohol in the previous month, and 3 in 10 reported binge drinking in the same time period. Close to half of all teens surveyed had ever used marijuana. For all measures of drug use and alcohol use, Colorado adolescents had higher rates than U.S. teens.

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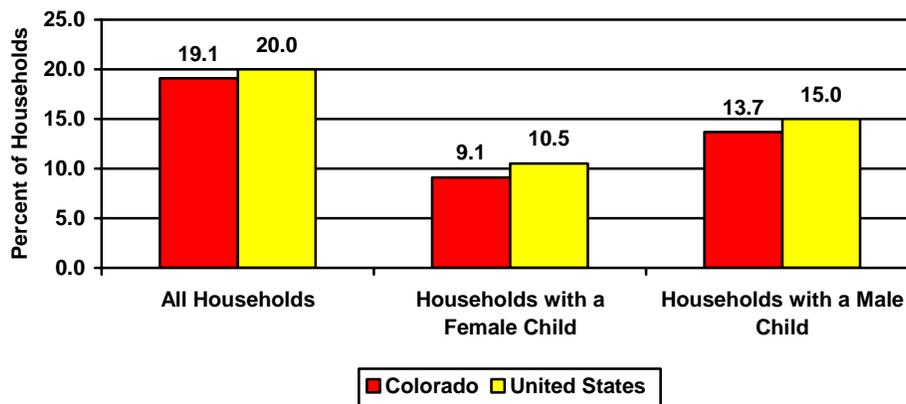
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Children and Youth with Special Health Care Needs

Children and youth with special health care needs are between the ages of 0 and 21 and have (or are at risk for) chronic physical, developmental, behavioral, or emotional conditions that require health and related services beyond that required by children generally. The percentage of households with a child with special health care needs has long been an unanswered question in Colorado. In 2001 a national survey, the State and Local Area Integrated Telephone Survey (SLAITS), provided the answer for each state, and the percentages in the text below refer to households that have children. (1)

Colorado's data revealed that nearly one in five households, or 19.1 percent, had such a child. In fact, about one in seven households (13.7 percent) had a male child with special health care needs and one in 11 households (9.1 percent) had a female child with special health care needs. These percentages were slightly lower than the national figures of 20.0 percent of households overall, 15.0 percent of households with a male child with special health care needs, and 10.5 percent of households with a female child with special health care needs. (1)

Figure 30. Percent of Households with Children with Special Health Care Needs, Colorado and the United States, 2001



Race/Ethnicity

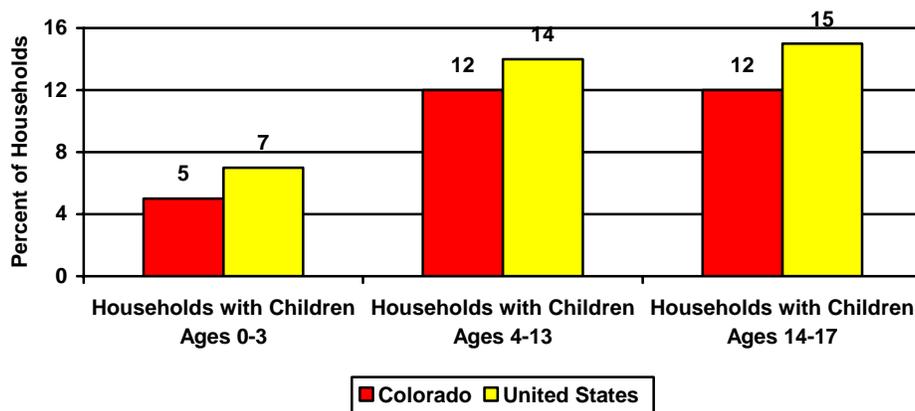
The data for racial and ethnic groups showed that 12 percent of White non-Hispanic households had a child with special health care needs and a similar proportion, 13 percent, of White Hispanic households had such a child. The percentage of Black households with special needs children was lower at 8 percent, while the percentage for multi-racial households was 17 percent. The Colorado percentages were higher than the national data for White Hispanic (13 percent vs. 9 percent) and for multiracial households (17 percent vs. 14 percent). The proportion of children with special health care needs in Colorado was lower than the national averages for White non-Hispanics (12 percent vs. 14 percent) and Black (8 percent vs. 13 percent). (1)

Age

The lowest proportion of Colorado children with special health care needs, 5 percent, was found in households with children who were 0 to 3 years old, increasing to 12 percent among households with children 4 to 13 years old and staying level at 12 percent among households with children 14 to 17 (Figure 31). This pattern is somewhat similar to the national pattern where an increasing proportion of children with special health care needs is found as the age of the children within the household increases. Nationally, 7 percent of households with children between 0 and 3 years had children with a special health care need, followed by 14 percent among households with children between 4 and 13 years old and 15 percent of households with children between 14 and 17. (1) Colorado's percentages are slightly below those found for the nation and remain at the same level for teens 14-17 as for children 4-13.

The age ranges described above are chosen because they represent ages of interest for children with special health care needs. Children from birth to age three are covered by the Early Intervention Program for Infants and Toddlers with Disabilities (Part C of IDEA). Youth age 14-17 include youth who have additional concerns as they transition to adult health care and providers, vocational or continued education, and adult insurance. Children age 4 to 13 fall between the two groups; the systems for children under 14 with special health care needs are uniquely different from the systems and resources for youth with special health care needs.

Figure 31. Percent of Households with Children with Special Health Care Needs by Age, Colorado and the United States, 2001



Income

The greatest proportion of children in Colorado with special health care needs, 12 percent, are in households that have an income greater than 300 percent of the federal poverty level, followed by households between 200 and 300 percent and households with incomes less than 200 percent of the federal poverty level (11 percent each). These figures appear to show more children with special health care needs in households with higher incomes, in contrast to national findings that show more special needs children

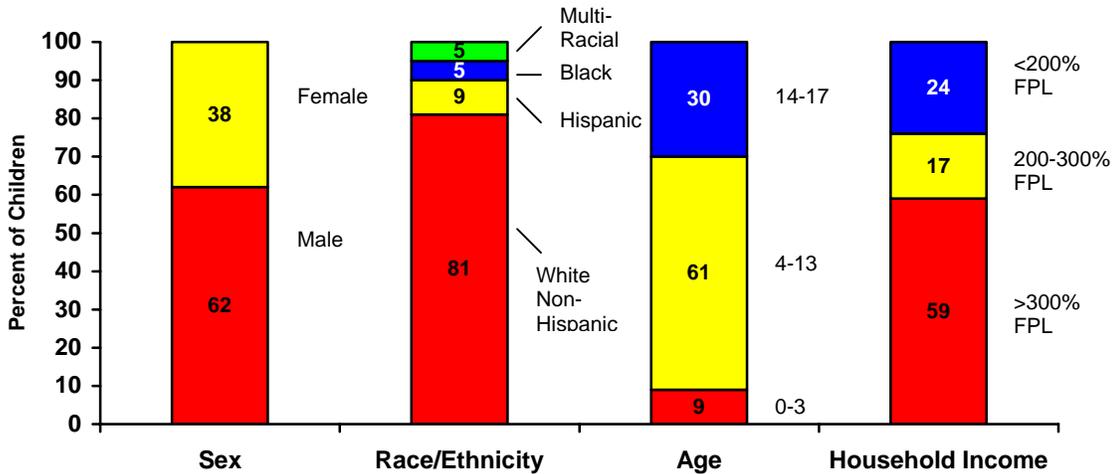
among lower-income households. (1) These differences are not statistically significant, however.

Estimated Number of Children with Special Health Care Needs

In 2001 the national SLAITS survey estimated that 12 percent of all children in Colorado between the ages of 0 and 18 had a special health care need. (1) Since Colorado includes youth up to age 21 in its estimates, the same percentage is assumed to apply to the age group 18-21. This yields a 2004 estimate of almost 170,000 children in Colorado age 0 to 21 that have a special health care need (2).

In 2001, 62 percent of children with special health care needs in Colorado were male and 38 percent were female. A total of 81 percent were White non-Hispanic, 9 percent were Hispanic, 5 percent were Black and 5 percent were multi-racial. Nine percent were between the ages of 0 and 3, 61 percent were between 4 and 13 and 30 percent were between 14 and 17. Fifty-nine percent of children with special health care needs in Colorado were from households with incomes greater than 300 percent of the federal poverty level, 17 percent were from households with incomes between 200 and 300 percent of the federal poverty level and 24 percent were from households with an incomes below 200 percent of the federal poverty level. (1)

Figure 32. Demographic Characteristics of Children with Special Health Care Needs, Colorado, 2001



Identification

Children and youth with special needs are identified by meeting one (or more) of the following five criteria:

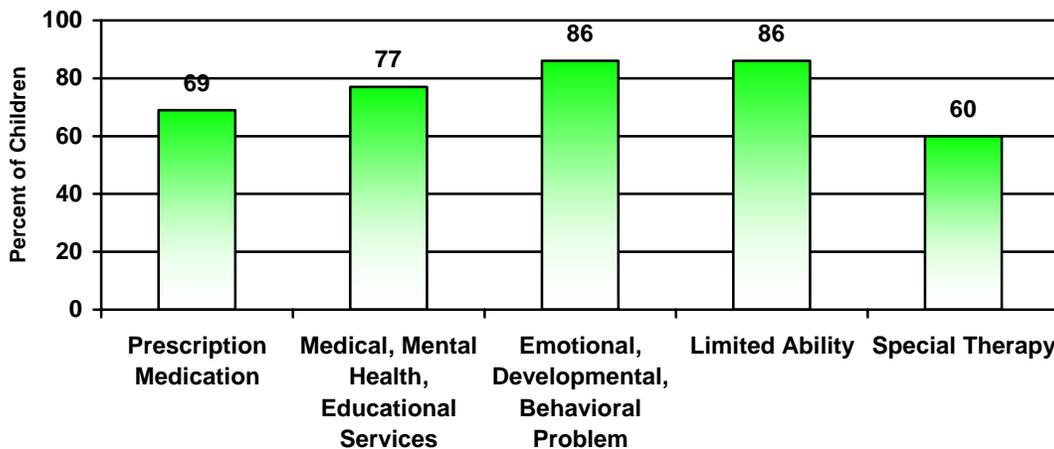
- needing prescription medication for any medical, behavioral or health problem that is expected to last for at least 12 months;
- needing or using more medical care, mental health care or educational services than is usual for most children or youth of the same age for a medical, behavioral or other health condition that is expected to last at least 12 months;

- being limited or prevented in their ability to do the things that most children or youth of the same age do, due to a medical, behavioral or other health condition that is expected to last for at least 12 months;
- needing or receiving special therapy such as physical, occupational, or speech therapy for a medical, behavioral or other health condition that is expected to last at least 12 months; and
- having any kind of emotional, developmental, or behavioral problem for which they need treatment or counseling that is expected to last more than 12 months.

Care and Services

In 2001, 69 percent of Colorado children identified as having special health care needs required prescription medication in the previous 12 months for a medical, developmental or emotional condition expected to last at least one year. Seventy-seven percent of children with special health care needs required medical care, mental health care or educational services in an amount that was greater than children of the same age. Eighty-six percent of children in Colorado who were identified as having special health care needs had an emotional, developmental or behavioral problem for which they needed to seek treatment. The same percentage of such children required care because of a limited or decreased ability to perform activities at a level equal to other children their age. Sixty percent of such children needed special therapy in the past 12 months for a medical, developmental or emotional condition that was expected to last at least 12 months. (1)

Figure 33. Care and Services Required by Children with Special Health Care Needs, Colorado, 2001



Unmet Need

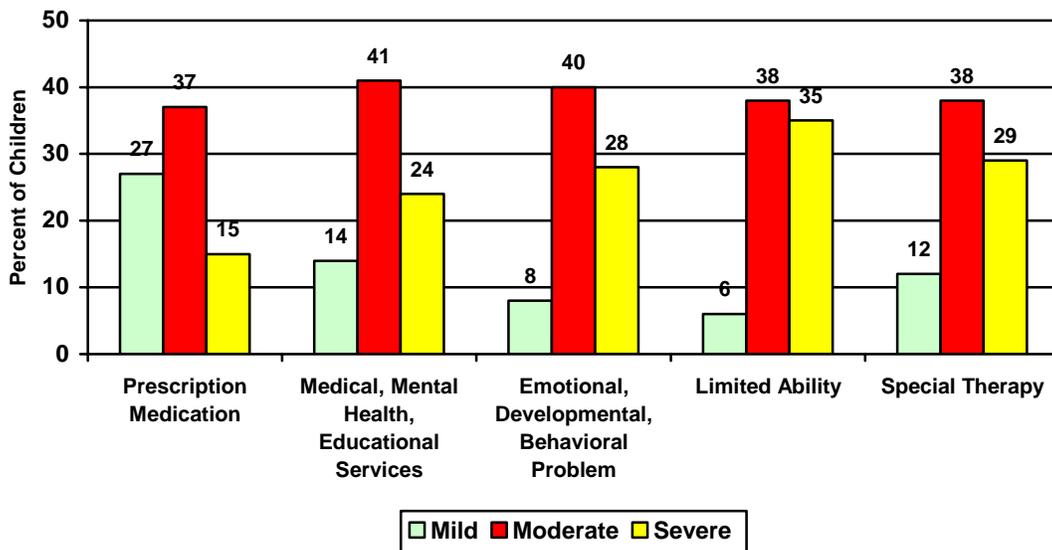
Not all children with special health care needs have their needs met with the current system of services. When children with special health care needs are stratified by severity of the condition, the greatest proportion of unmet need is among those with moderately severe conditions (Figure 34). (1)

Children with special health care needs are identified as such because they require prescription medication, need medical, mental health or education services more than other children, have an emotional, developmental or behavioral problem, need special therapy, or have limited ability to do things that other children their age can do.

Regardless of why a child meets criteria for having a special health care need, the greatest proportion of children with an unmet medical need are children who rank their health condition as moderate: 37 percent have an unmet need for prescription medication and 41 percent have an unmet need for medical, mental health, or educational services. Within the category of children who have a special health care need due to needing prescription medication, the second greatest proportion of children with unmet medical needs are children who rank their health condition as mild (27 percent) followed by severe (15 percent), which is unique to this category.

In all other categories, the second greatest proportion of children with an unmet medical need is in children who rank their health condition as severe.

Figure 34. Unmet Need Among Children with Special Health Care Needs by Severity of Condition, Colorado, 2001



Insurance Coverage

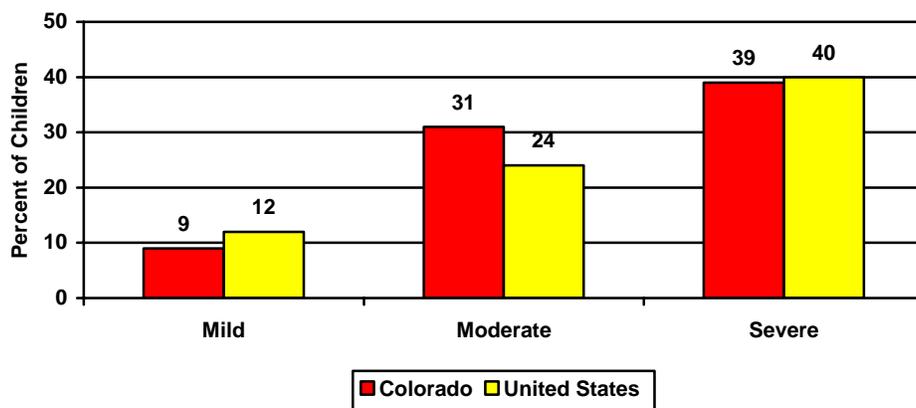
In 2001, 4 percent of children with special health care needs in Colorado did not have any type of insurance at the time of the interview. Nine percent had a gap in their coverage in the 12 months prior to the interview. Of those children with special health care needs who had some type of insurance at the time of the interview, 25 percent were underinsured. Children were considered underinsured if at least one of the following conditions was met:

- insured, but delayed or did not receive needed care because of cost; or
- family paid over \$500 in out-of-pocket costs for medical, health related care in the past year and had financial problems caused by the child’s health condition; or

- family paid over \$500 in out-of-pocket costs for medical, health related care in the past year and needed additional income to cover the child’s medical expenses.

The proportion of underinsured children with special health care needs in Colorado ranges from 9 percent among children with mild special health care conditions to 40 percent of children with severe special health care conditions. (1) Figure 35 shows these numbers along with national estimates. Colorado’s figures are similar to the U.S. figures, except for children with moderate conditions who are more likely to be uninsured.

Figure 35. Children with Special Health Care Needs who are Underinsured by Severity of Condition, Colorado and the United States, 2001



Impact on Families

Having a child with special health care needs has a significant impact on a family. In 2001, 20 percent of families reported having financial problems due to their child’s condition. Seventeen percent of Colorado families needed additional income due to their child’s condition and 6 percent of families had a change in employment status. Three percent of families spent more than 11 hours a week coordinating their child’s care (1).

Families report that they keep their income artificially low so as to be able to retain Medicaid through the Supplemental Security Income Program entitlement. Private health care coverage may be beyond their means--and it often does not provide the specialty benefits and providers that children with special health care needs require

National Outcome Measures

The Maternal and Child Health Bureau, in an effort to address the needs of children and youth with special health care needs, has identified six national outcome measures that will, if implemented, increase the health status of children with special health care needs. Table 8 includes the national outcome measures and the indicators or performance measures used to measure each one. The data reveal that Colorado was above the national average on families participating in decision-making (57 percent vs. 56 percent) and on organized community-based systems (77 percent vs. 74 percent), but lower than the national average on the availability of medical homes (52 percent vs. 53 percent),

Table 8. National Outcomes and Performance Measures for Children and Youth with Special Health Care Needs, 2001

	Percent Success*	
	Colorado	National
Outcome 1. Families of CSHCN will partner in decision making at all levels, and be satisfied with the services they receive.	57	56
a. Doctors usually or always made the family feel like a partner.	87	84
b. Family was very satisfied with services received.	60	60
Outcome 2. All CSHCN will receive coordinated ongoing comprehensive care within a medical home.	52	53
a. The child has a usual source of care.	91	91
i. The child has a usual source of sick care.	91	91
ii. The child has a usual source of preventative care.	99	99
b. The child has a personal doctor or nurse.	88	89
c. The child has no problem obtaining referrals when needed.	75	78
d. Effective care coordination is received when needed.	31	40
i. The child has professional care coordination when needed.	75	82
ii. Doctors communicate well with each other.	47	54
iii. Doctors communicate well with other programs.	26	37
e. The child receives family-centered care.	70	67
i. Doctors usually or always spend enough time.	86	84
ii. Doctors usually or always listen carefully.	90	88
iii. Doctors are usually or always sensitive to values and customs.	87	87
iv. Doctors usually or always provide needed information.	81	81
v. Doctors usually or always make the family feel like a partner.	88	86
Outcome 3. Families of CSHCN will have adequate private and/or public insurance to pay for the services they need.	58	60
a. The child has public or private insurance at time of interview.	96	95
b. The child has no gaps in coverage during the year prior to the interview.	91	88
c. Insurance usually or always meets the child's needs.	85	86
d. Costs not covered by insurance are usually or always reasonable.	70	72
e. Insurance usually or always permits child to see needed providers.	89	88
Outcome 4. All children will be screened early and continuously for SHCN.	NA**	NA**
a. % of infants whose mother began prenatal screening in the 1st trimester for: smoking, subst. abuse; test for birth defects; HIV; abuse; anemia; hepatitis; Rh factor; and diabetes.	NA**	NA**
b. % of at risk infants and children being tracked for SHCN and developmental delays.	NA**	NA**
c. % of children receiving age appropriate well child checks including: vision; hearing; developmental; behavioral; mental health oral health; metabolic; EPSDT (if appropriate).	NA**	NA**
d. % of children receiving needed follow up due to failed screening or risk factors: vision; hearing; developmental; behavioral; mental health; oral health; and metabolic.	NA**	NA**
Outcome 5. Community-based service systems will be organized so families can use them easily.	77	74
a. Services are usually or always organized for easy use.	77	74
Outcome 6. Youth with special health care needs will receive the services necessary to make transitions to adult life, including adult health care, work and independence.	3	6
a. The child receives guidance and support in the transition to adulthood.	15	15
i. Doctors have talked about changing needs.	47	50
ii. The child has a plan for addressing changing needs.	65	59
iii. Doctors discussed shift to adult provider.	39	42
b. The child has received vocational or career training.	22	26

*Centers for Disease Control and Prevention, National Center for Health Statistics, State and Local Area Integrated Telephone Survey, National Survey of Children with Special Health Care Needs, 2001

** Data not available through the national survey.

adequate insurance (58 percent vs. 60 percent), and youth transition to adult services (3 percent vs. 6 percent). (1) Early and continuous screening was not addressed in the survey. These differences may not be significant. Goals for each of the outcome measures are not currently set for 2010.

Healthy People 2010 Goals

The current Healthy People 2010 goals include several goals specific to certain disabilities or diagnoses. Data are available for mental retardation, cerebral palsy, and autism.

Mental Retardation

Mental Retardation is a disability characterized by significant limitations both in intellectual functioning and in adaptive behavior as expressed in conceptual, social, and practical adaptive skills. The disability originates before the age of 18. The best estimate for the rate of mental retardation in Colorado is through the Colorado Responds to Children with Special Needs program. In 2002 the 5-year rate for mental retardation in Colorado was found to be 1.5 per 10,000 live births which is above the Healthy People 2010 goal of 1.24 per 10,000 live births. (5)

Cerebral Palsy

Cerebral Palsy is a functional disorder caused by damage to the brain during pregnancy, delivery, or shortly after birth. It is characterized by movement disorders, like spasticity (tight limb muscles), purposeless movements, rigidity (severe form of spasticity), a lack of balance, or a combination of these disorders. Individuals with cerebral palsy may also experience seizures, abnormal speech, hearing and visual impairments and mental retardation. In 2002 Colorado's 5-year cerebral palsy rate was 5.6 per 10,000 live births, higher than the Healthy People 2010 goal of 3.2 per 10,000 live births. (5)

Autism

Autism Spectrum Disorders are defined as a constellation of behaviors indicating social, communicative, and behavioral impairment or abnormalities. The essential features of ASD are impaired reciprocal social interactions, delayed or unusual communication styles, and restricted or repetitive behavior patterns. Currently a surveillance project is being developed by the Colorado Department of Public Health and Environment, to address the prevalence and demographic characteristics of those with Autism Spectrum Disorders in Colorado. Data are expected in 2006.

Summary

In the Health Status of the Maternal and Child Health Population report written in the year 2000, virtually no data were available for children with special health care needs. With the advent of the national State and Local Area Telephone Survey in 2001, state-specific data for Colorado were collected for the first time. One in five Colorado households with children has a child with special health care needs. These children are more likely to be male, White non-Hispanic, age 4 to 13, and to come from households with incomes greater than 300% of poverty. They have many medical and associated needs, which may not be met, especially among children whose conditions are moderately severe.

While most children have some kind of health insurance, one in four is considered to be underinsured. One in five families report financial problems stemming from their child's condition.

In recent years six specific measures have been chosen to frame the issues of importance in improving the health of children with special health care needs. Colorado's experience is similar to the national averages on most measures, which include families partnering in decision-making, the availability of coordinated and community-based care, adequate insurance, screening for conditions, and transition of youth to adult services. For most measures about half to three-fourths of families report success, but more ambitious goals for 2010 remain to be set. Two measures—for mental retardation and cerebral palsy—have been specified, and Colorado's current rates do not yet meet the objectives.

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Oral Health

Oral health is a critical issue at every age, but addressing oral health problems is especially important in the maternal and child health population. It is not widely understood that dental decay is one of the most common chronic infectious diseases among U.S. children.

This preventable health problem begins early. If it remains untreated, tooth decay can result in pain, dysfunction, underweight, and poor appearance—problems that can greatly reduce a child’s capacity to succeed in the educational environment. Dental caries (tooth decay) is the single most common chronic childhood disease—five times more common than asthma and seven times more common than hay fever. (1) In addition, periodontal disease has been associated with adverse pregnancy outcomes such as preterm and low birth weight infants and preeclampsia. (2, 3) It is important to document the extent of dental problems in the maternal and child health population as well as to describe access to oral health care providers.

Prevalence of Oral Health Problems Among Children

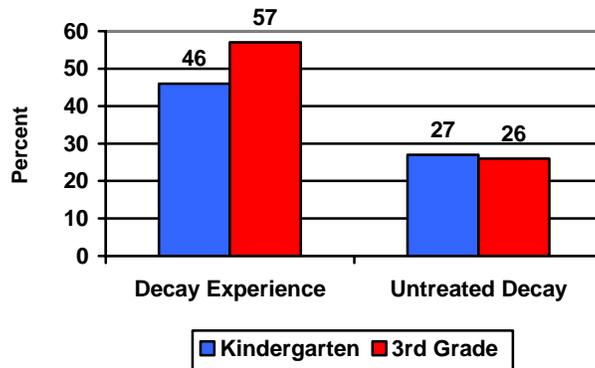
The following Healthy People 2010 objectives focus on decreasing the proportion of children and adults experiencing dental caries:

- Reduce the proportion of children and adolescents who have dental caries in their permanent or primary teeth to 11 percent for children age 2 to 4, to 42 percent for children age 6 to 8, and to 51 percent for adolescents
- Reduce the proportion of children, adolescents and adults with untreated dental decay to 9 percent of young children, 21 percent of school-age children, and 15 percent of adolescents and adults
- Increase the proportion of children who have received dental sealants on their molar teeth to 50 percent. (4)

During the 2003-2004 school year, the Colorado Department of Public Health and Environment conducted a statewide oral health survey of kindergarten and third grade children enrolled in Colorado’s public elementary schools. A similar survey was done in 2001-2002 with third grade children only. The results from both surveys indicate that dental decay is a significant public health problem for Colorado’s children.

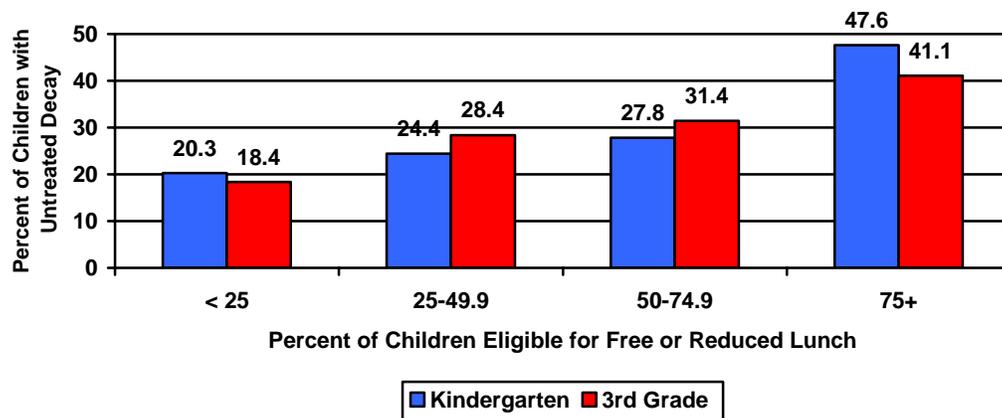
In 2004, 46 percent of kindergarten and 57 percent of third grade children had cavities and/or fillings (decay experience); 27 percent of kindergarten and 26 percent of third grade children had untreated dental decay (cavities). (Figure 36). In 2002, 60 percent of third graders had decay experience and 26 percent had untreated decay. While dental sealants are a proven method for preventing decay, most of Colorado’s children do not have access to this preventive service. Only 35 percent of the third grade children had dental sealants, although this was higher than the 29 percent seen in the earlier survey. Colorado is not yet reaching the national objective of 50%.

Figure 36. Percent of School Children with Decay Experience and Untreated Dental Decay by Grade, Colorado, 2004



Children from low-income schools have poorer oral health. Compared to children from higher income schools (where fewer than 25 percent are eligible for free or reduced price meals), children in low-income schools (where at least 75 percent are eligible for free or reduced price meals) have a significantly higher prevalence of both decay experience and untreated decay. In low-income schools, close to 48 percent of kindergarten children and 41 percent of third graders had untreated dental caries compared to 20 percent of kindergartners and 18 percent of third graders in higher income schools. (Figure 37) Children from low-income schools, moreover, have a significantly lower prevalence of dental sealants. Only 22 percent of children in low-income schools had dental sealants compared to close to 41 percent of children in higher income schools (not shown).

Figure 37. Percent of Colorado Children with Untreated Dental Decay by Free and Reduced Lunch Status of the School, 2004



Hispanic children, compared to White, non-Hispanic children, had a significantly higher proportion of existing dental caries and untreated decay as shown below in Table 9.

Table 9. Percent of Colorado Children with Caries Experience and Untreated Decay by Grade and Race/Ethnicity, 2004

		Race/Ethnicity	
		White Non-Hispanic	Hispanic
Kindergarten Students			
	Caries Experience	35.8	62.9
	Untreated Decay	21.5	38.7
Third Grade Students			
	Caries Experience	53.3	67.3
	Untreated Decay	22.2	37.4

A smaller proportion of Hispanic third graders in the 2002-2003 survey had dental sealants compared to White non-Hispanics (25.7 percent vs. 38.1 percent). In the 2001-2002 survey, only 17.7 percent of Hispanic third graders had sealants; half the level of White non-Hispanic children (35.4 percent). It appears that some progress has been made recently in increasing the percent of Hispanic children with sealants.

Appendix 1 provides an estimate of these oral health measures for third graders for each county. Fifteen counties had 60 percent or more children with a history of dental caries; 21 counties had 30 percent or more children with untreated caries. No county met the national objective of having 50 percent of children with dental sealants. While two major urban counties had high levels of oral health problems among their third grade children, the areas of the state that have the highest levels of such problems are in the rural south central and southeastern plains areas.

Access to Fluoridated Water

For the last 55 years, water fluoridation has been a proven public health measure shown to be safe, economical, and effective in protecting the population from tooth decay. Currently, about 75 percent of Colorado residents on public water systems drink water that is optimal in fluoride, which is the Healthy People 2010 objective for the nation. However, there are several metropolitan areas where fluoride is deficient at least part of the year. There are a total of 51 community water systems for populations of 1,000 or more that are deficient in fluoride. These fluoride-deficient water systems serve approximately 571,000 people in the state. (5)

Access to and Use of the Oral Health Care System

In order to achieve the Healthy People 2010 objectives, women and children need access to oral health care providers. The percentage of the population that has seen a provider is one such measure. The objective for the nation is to increase to 56 percent the proportion of children and adults who use the oral health care system each year. Based on the 1999 and 2002 Colorado Behavioral Risk Factor Surveillance System (BRFSS), over 70 percent of women of reproductive age (18 to 44) had accessed the oral health system in the past 12 months, meeting the national objective.

Based on results of the Colorado PRAMS, in 2002 47.5 percent of new mothers said that they had had a dental care visit less than a year ago, i.e., within 11 months or less. This percentage has stayed consistent since these data have been collected in 2000. Mothers responding to the PRAMS survey who are receiving Medicaid have consistently reported lower rates of dental care visits than mothers not on Medicaid. In 2002, close to 30 percent of Medicaid mothers reported having a dental health visit within the past year, compared to 55 percent of mothers not on Medicaid. In a study using 2000 Colorado PRAMS data, the Oral Health Program at the Colorado Department of Public Health and Environment found the following groups of women had the highest rates of seeking dental care: 30 and older, non-smokers, non-Hispanic, college educated, married, and with household incomes of \$40,000 or more. Not seeking dental care was associated with unintended pregnancy, receiving prenatal care after the first trimester, and preterm birth. Since many of these factors are highly correlated, it is important to know the most salient risk factors for not seeking dental care in order to focus interventions on the appropriate populations of women. Appendix 2 provides the estimates from the original analysis. There are many reasons for not seeking dental care including cost, a lack of providers, fear of dental treatment and other barriers such as lack of transportation and care for children.

In 2000 the Colorado Commission on Children's Dental Health determined that there is a dental workforce shortage in Colorado. (6) One way to increase the number of providers is through a program which designates counties as dental health professional shortage areas. The benefits of a dental health shortage area designation include National Health Service Corps options with qualifying scores and establishment of federally funded dental safety net clinics. In Colorado, 12 counties have applied for and received designations as dental health professional shortage areas. Eight other counties have designated shortage areas within the county that do not include the whole county. Not all Colorado counties have applied for such designation so it is possible that more counties are eligible.

Summary

Dental decay is one of the most common chronic infectious diseases among U.S. children, although it is a preventable disease. Nearly half of kindergartners and over half of third graders in Colorado have experienced tooth decay, and one-quarter have untreated decay. About one-third of third graders have dental sealants, which are a proven method of preventing tooth decay. The Healthy People 2010 goal is for at least half of third graders to have sealants.

Hispanic children, compared to White, non-Hispanic children, had a significantly higher proportion of existing dental caries and untreated decay. Fewer than one in six Hispanic third graders had sealants, half the level of White non-Hispanic children.

Access to fluoridated water is critical to the protection of tooth decay. About 75 percent of Coloradans on public water systems have access to fluoridated water, but well over half a million state residents do not drink fluoridated water.

In order to achieve Healthy People 2010 objectives, women and children need access to oral health care providers. Data available for women suggest that 70 percent have such access, although the proportion drops to just under half among all pregnant women.

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Access to Health Care

In addition to the oral health care issues covered in the preceding section, access to all health care services is critical for the maternal and child health population. Healthy People 2010 outlines a number of objectives necessary to ensure access to quality health care services for the whole population. These objectives include:

- Increase the proportion of persons with health insurance to 100 percent
- Increase the proportion of persons with a specific source of ongoing care to 96 percent among children and adolescents and to 96 percent for adults
- Increase the proportion of persons with a usual primary care provider to 85 percent. (1)

Health Insurance Coverage

Health insurance is necessary to keep children and their families healthy. An American College of Physicians study revealed that uninsured children were six times more likely to go without needed medical, dental, or other health care than their insured counterparts. (2) According to the U.S. Census Bureau, an estimated 15.6 of the population nationally was without health insurance coverage in 2003, up from 15.2 percent in 2002. The proportion of children who were without health insurance did not change, remaining at 11.4 percent of all children, or 8.4 million, in 2003. Children in poverty, with a rate of 19.2 percent, were more likely to be uninsured than all children. (3)

Colorado ranked 37th in the proportion of residents with health insurance coverage among all states in 2003. (4) A total of 17.2 percent of all Colorado residents and 13.7 percent of Colorado’s children were without health insurance in that year. Colorado’s ranking for children with health insurance coverage was 43rd among all states. (5) Among the estimated 408,000 children in Colorado living at or below 200 percent of the federal poverty level, 105,000 were estimated to be without health insurance, more than 25 percent.(6)

Table 10 provides the breakdown of health insurance coverage for children under 18. This table indicates that a larger proportion of children in Colorado compared to the nation have health insurance through the military and a smaller proportion of children receive Medicaid.

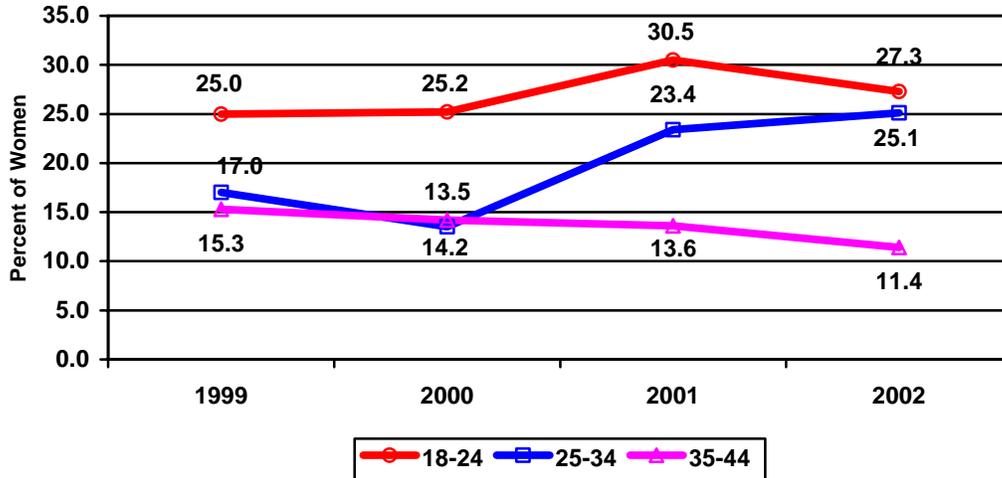
Table 10. A Comparison of Health Insurance Coverage by Type for Children Under 18, United States and Colorado, 2003

Health Insurance Coverage	Percent of Children	
	United States	Colorado
Private	65.9	69.1
Medicaid	26.4	16.8
Military	2.7	5.5
No Coverage - Uninsured	11.4	13.7

Coverage for Women

Based on Colorado Behavioral Risk Factor Surveillance System data, an estimated 180,755 women 18 to 44 were without health insurance at some time in 2002. Figure 38 shows that the proportion of women of childbearing age without health insurance is greater for younger women than older women and that the percentage for younger women increased in 2001 and 2002 compared to the two previous years.

Figure 38. Percentage of Colorado Women of Childbearing Age without Health Insurance by Age and Year, Colorado, 1999-2002



Coverage for Children and Pregnant Women

During the first six years of life, children are eligible for Medicaid in families at or below 133% of the federal poverty limit and at 100% of the federal poverty limit for children 6-19, if the family's assets are less than \$2,500, including the value of a car. (7) The "assets test" does not apply to infants under the age of 1. A total of 262,321 children age 0 to 20 received some service covered by Medicaid in fiscal year 2003.

According to Colorado PRAMS data, the proportion of women and infants using Medicaid to help cover costs of medical care increased in 2002. Medicaid was the insurer for prenatal visits for 32 percent of women who had a live birth in 2002; up from 28 percent in 2001. The proportion of women whose labor and delivery costs were covered by Medicaid increased from 32 percent in 2001 to 36 percent in 2002. From 1997 to 2001 these proportions had remained steady. According to their mothers' responses on PRAMS, close to 37 percent of newborns were covered by Medicaid, up from 32 percent in 2001.

The Colorado Child Health Plan Plus (CHP+) is a low-cost health insurance program for uninsured Colorado children ages 18 and under who do not qualify for Medicaid but who cannot afford private insurance. State budget challenges forced the program to freeze enrollment at 53,000 children in November 2003. Enrollment was resumed on July 1, 2004, and some pregnant women who meet the income guidelines are also included. (7)

The Colorado Community Health Network, CCHN, is the state primary care association representing 15 community, migrant, school-based, public housing, and homeless centers operating 108 health care delivery sites. Colorado's community health centers (CHCs) provide over 1.5 million visits to over 372,000 low-income patients each year, many of them women and children. Community health centers are the medical home for an estimated 28 percent of Colorado's low-income, uninsured population, 34 percent of Child Health Plan Plus enrollees, and 28 percent of Medicaid enrollees. (9) However, CHCs are not available in all communities that have populations in need, and they lack sufficient resources to meet the level of need found in the counties where they are located.

Source of Medical Care and Primary Care Provider

Access to care includes having a specific source of ongoing care, i.e., a particular doctor's office, clinic, health center, or other place to go to for health care. A usual source of primary care helps people clarify the nature of their health problems and can direct them to appropriate health services, including specialty care. Based on 2000 to 2003 BRFSS data, between 74 and 79 percent of women ages 18 to 44 had one person whom they thought of as their personal doctor or health care provider.

In a study of the number of full time equivalent (FTE) primary care physicians in the state, the Colorado Capacity Assessment Project found that statewide there were 0.63 primary care FTE for every 1,000 insured patients, 0.68 for every 1,000 Medicaid patients, and 0.12 for every 1,000 uninsured patients. (10) When this survey was done in the summer of 2001, 84 percent of primary care physicians were accepting new insured patients and only 7 percent were accepting new Medicaid patients. These statistics give some indication of the difficulty Medicaid patients may have in finding primary care. While there is no formal standard for the ideal number of primary care physicians per 1,000 population, it is clear that the numbers of physicians available are very low.

School-based health centers (SBHC) are another source of medical care and primary care for children and adolescents. Such centers serve as a primary health care facility located within or on school grounds. They are staffed by a multi-disciplinary team of pediatric or adolescent health specialists, including the school nurse, nurse practitioners, physician assistants, doctors, and behavioral health professionals. Most SBHC centers are located in areas with a high number of uninsured children and in communities with poor access to health care for this age group. In Colorado there are thirty-two schools have an SBHC on site and one mobile clinic travels to ten school sites. An additional 30 schools are linked to SBHCs, providing health care access to approximately 52,318 school children. This level means that 1 out of every 13 children in public school in the state has access to a school-based health center.

In all, 26,642 children received a total of 68,152 health visits in the 2002-2003 school year, including 8,136 physical health exams. In addition, students attending schools served by SBHCs also received 14,428 behavioral health visits through the clinics. In contrast, in 1997, 12,604 students used SBHCs for a total of 52,804 visits. (11)

Enhanced Services for Pregnant Women

While a source of on-going care and primary care is critical to the receipt of quality health services, other programs providing comprehensive services are also needed, especially for high-risk populations. Two such programs in Colorado are the Prenatal Plus Program and the Colorado Nurse Home Visitor Program. Prenatal Plus is a Medicaid-funded program which provides case management, nutrition, and psychosocial services to Medicaid-eligible pregnant women in Colorado who are assessed to be at high risk for delivering low birth weight infants. Services are provided by a team composed of a care coordinator, a registered dietitian, and a mental health professional.

A total of 3,569 women received Prenatal Plus services in 2002, the highest number ever served. (12) This total represents a 19 percent increase in client volume from 2001. The low birth weight rate for women delivering in the program was 9.7 percent. Without the services available through Prenatal Plus, a low birth weight rate of 13.7 percent would have been expected for these women. While women who received the recommended 10 or more visits were more likely to resolve their risks, only 41 percent received such care. Reimbursement rates for model care have been well below the actual cost of the services to providers, and may discourage agencies from providing model care. (12) While the program has shown positive results, fewer than one in four eligible high-risk pregnant women received Prenatal Plus services in 2001. A study done by the University of Colorado Health Sciences found that for every dollar spent on Prenatal Plus services, \$2.48 is saved in Medicaid costs annually. (13)

The Colorado Nurse Home Visitor Program makes home visitation services by nurses available to all first-time pregnant women whose incomes are under 200 percent of the federal poverty level and who choose to participate. Visitation is available up to the child's second birthday. Research substantiates that short-term and long-term improvements in the health and the life courses of the participating mothers and their children have resulted when specially trained nurses provide home visitation services for low-income, first-time mothers from early in pregnancy through the child's second birthday. The Nurse Home Visitor Program addresses the mother's personal health, care giving for newborns, children's health care, child development and home safety as well as access to educational, social and employment resources needed to achieve personal goals and the well being of the family. The nurses provide weekly to bi-weekly home visits, averaging nine visits per family during pregnancy, twelve visits per family for those with infants, and three visits per family for those with toddlers.

Currently 49 of the state's 64 counties have Nurse Home Visitor programs. Over 2,500 participants were enrolled in the program from its inception in fiscal year 2000-2001 through June 30, 2003, 90 percent by the 28th week of gestation. Evaluation of the program found several positive outcomes for the program's participants and their babies. These included a significant decrease in smoking during pregnancy, lower prematurity rates, higher breastfeeding rates, high immunization rates, an increase in the number of women completing their high school diploma or GEDs, and an increase in the number of women participating in the workforce. Areas identified for improvement include reducing the percent of low birth weight infants among clients and decreasing client attrition. (14)

Access to Mental Health Services

Mental health problems in children and adolescents affect all aspects of their lives. As defined by the Surgeon General, child mental health is “the achievement of expected developmental, cognitive, social, and emotional milestones by secure attachments, satisfying social relationships, and effective coping skills.” (15) Close to 21 percent of all children 9-17 in the U.S. are estimated to have a diagnosable mental or addictive disorder associated with at least some minimum impairment in their lives; yet only about 5 percent will exhibit extreme functional impairment. (15)

In a report to the state legislature, the Colorado Office of Mental Health Services estimated that 8.9 percent of children under 21 and with family incomes below 300 percent of poverty had a serious emotional disturbance, that is, a diagnosable mental disorder that severely disrupts social, academic, and emotional functioning. (16) A total of 56 percent of the population eligible to receive public mental health services did so. Such services were defined as the child having contact with any of the following Department of Human Services public sectors: Mental Health Services, Child Welfare, Youth Corrections, Special Education, and Alcohol and Drug Abuse. Thus, while the unmet need available to children in this special population (families with low household incomes who are eligible for services through Colorado’s Mental Health Services Division) has been documented, little is known about how these children may be served through other systems, e.g., school-based health centers, and how the services provided in other programs overlap, are complimentary, or distinct from those found in other health programs. In addition, little is known about the appropriateness and the quality of services received. Little is known about those children who may have a diagnosable disorder but are not considered to have the serious emotional disturbance mentioned above.

As reported above, in Colorado, there were over 14,400 behavioral health visits to school based health centers in the 2002-2003 school year. (17) School-based health centers are clearly an important feature in access to mental health services to children in Colorado.

Summary

Access to all health care services is critical for the maternal and child health population, and health insurance is necessary to obtain access. Uninsured children are six times more likely to go without needed medical, dental, or other health care than their insured counterparts.

Colorado ranked 37th in the proportion of residents with health insurance coverage, among all states in 2003. A total of 16.2 percent of all Colorado residents and 13.7 percent of Colorado’s children were without health insurance in that year; Colorado’s ranking for children with health insurance coverage was 43rd among all states. Furthermore, about one-quarter of women under the age of 35 are without insurance.

About one-third of women giving birth each year receive coverage for prenatal care through Medicaid. This proportion has increased in recent years. The Prenatal Plus Program provides services through nurses, nutritionists, social workers and community

health workers that are in addition to prenatal care that dramatically improve outcomes for high-risk women on Medicaid. The Nurse Home Visitor Program also provides intensive health education, counseling and case management for low income, at-risk, first-time pregnant women through skilled nurse home visitors throughout the state.

About 1 in 6 children in the state is covered by Medicaid. In addition, the Colorado Child Health Plan Plus program covers about one in every 15 children in the state. State budget challenges have limited the number of children who are covered through CHP+. School-based health centers are a newer type of delivery system for care, and serve many children who otherwise do not have access to care, but there are a limited number of centers.

Community health centers are an important source of care for low-income residents, both Medicaid-eligible, CHP+-eligible, and those who are uninsured or underinsured. However, CHCs are not available in all communities that have populations in need and do not have sufficient capacity to meet the level of need in many communities where they do exist.

Many children or adolescents need some form of mental health care or counseling, but the majority do not receive help. Not only is access to care not assured, services are not available in many areas of the state.

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Appendix 1

Colorado Oral Health Survey 2003-2004 Oral Health of 3rd Grade Children County Level Estimates

County Name	Percent with Untreated Decay	Percent with Caries History	Percent with Sealants
Adams	26.1	56.9	34.2
Alamosa	31.4	60.4	25.5
Arapahoe	24.3	55.7	36.1
Archuleta	28.4	55.8	36.7
Baca	31.2	60.3	25.8
Bent	30.5	59.0	28.8
Boulder	22.2	54.3	37.9
Chaffee	28.4	55.8	36.7
Cheyenne	29.8	58.0	31.4
Clear Creek	24.9	54.5	38.2
Conejos	36.8	67.6	23.7
Costilla	41.1	73.4	22.2
Crowley	31.4	60.4	25.5
Custer	28.4	55.8	36.7
Delta	29.3	58.4	29.8
Denver	35.6	66.7	26.6
Dolores	28.4	55.8	36.7
Douglas	18.4	52.1	40.8
Eagle	23.7	54.1	38.6
Elbert	19.3	52.4	40.4
El Paso	24.6	55.6	36.0
Fremont	28.4	56.5	34.7
Garfield	25.1	54.6	38.1
Gilpin	20.2	52.8	40.1
Grand	22.3	53.6	39.2
Gunnison	18.4	52.1	40.8
Hinsdale	28.4	55.8	36.7
Huerfano	30.7	59.3	28.2
Jackson	28.4	55.8	36.7
Jefferson	21.4	53.6	38.6
Kiowa	26.5	55.1	37.5
Kit Carson	30.3	58.7	29.7
Lake	31.4	60.4	25.5
La Plata	23.9	54.6	37.3
Larimer	23.9	54.6	37.6
Las Animas	29.6	59.2	29.6
Lincoln	28.7	56.2	35.7
Logan	27.8	57.1	32.5
Mesa	28.8	57.8	33.6
Mineral	28.4	55.8	36.7
Moffat	28.4	55.8	36.7
Montezuma	31.1	59.9	26.6

County Name	Percent with Untreated Decay	Percent with Caries History	Percent with Sealants
Montrose	30.2	58.5	30.4
Morgan	32.8	62.2	26.4
Otero	33.6	63.2	27.3
Ouray	18.4	52.1	40.8
Park	21.6	53.3	39.5
Phillips	25.9	54.9	37.7
Pitkin	18.4	52.1	40.8
Prowers	32.8	62.3	25.6
Pueblo	30.8	60.5	31.0
Rio Blanco	25.0	54.5	38.1
Rio Grande	31.0	59.8	27.0
Routt	21.6	53.3	39.5
Saguache	39.0	70.6	23.5
San Juan	31.4	60.4	25.5
San Miguel	21.4	53.2	39.6
Sedgwick	31.4	60.0	33.3
Summit	20.2	52.8	40.1
Teller	20.2	52.8	40.1
Washington	28.4	55.8	36.7
Weld	29.3	59.5	32.5
Yuma	31.3	60.3	25.9

Note:

The information in this table is based on the oral health of children examined in Colorado and the proportion of children in each county enrolled in schools with varying levels of eligibility for the free and/or reduced price meal program (<25%, 25-49%, 50-74%, and ≥75%). These are estimates of oral health status based solely on the income distribution of a county and do not consider other important factors such as insurance coverage, access to care or community water fluoridation. Income, however, is a significant predictor of oral health status.

Appendix 2
Characteristics associated with not seeking dental care among all Colorado mothers in 2000

Characteristic	N	Sought care (%)	N	Did not seek (%)	PR (95% CI)
Mother's Age (Years)					
15-19	66	25.7	182	74.3	1.58[†] (1.38, 1.81)
20-24	135	29.2	350	70.8	1.50[†] (1.33, 1.70)
25-29	208	38.3	357	61.7	1.31[†] (1.15, 1.49)
30 and older	408	52.9	389	47.1	Ref.
Mothers age 15-19, 20-24, or 25-29 were less likely to seek dental care than mothers 30 and older.					
Education					
Less than high school	84	21.4	265	78.6	1.63[†] (1.47, 1.81)
High school	192	33.4	426	66.6	1.38[†] (1.24, 1.54)
More than high school	534	51.8	567	48.2	Ref.
Mothers with less than high school or high school education were less likely to seek dental care than mothers with greater than high school education.					
Race					
White	776	40.8	1177	59.2	Ref.
Black	23	31.7	53	68.3	n/a
Other	18	26.3	47	73.7	n/a
Ethnicity					
Hispanic	118	21.2	378	78.8	1.49[†] (1.37, 1.62)
Non-Hispanic	698	47.1	900	52.9	Ref.
Hispanic mothers were less likely to seek dental care than non-Hispanic mothers.					
Marital status					
Not Married	142	28.6	356	71.4	1.27[†] (1.16, 1.40)
Married	675	43.9	922	56.1	Ref.
Mothers who were unmarried were less likely to seek dental care than married mothers.					
Annual Household Income (\$)					
Less than 15,999	112	21.7	392	78.3	1.90[†]

16,000-24,999	73	23.3	177	76.7	(1.69, 2.13) 1.86[†] (1.63, 2.12)
25,000- 39,999	120	35.9	202	64.1	1.55[†] (1.35, 1.79)
40,000 or more	469	58.7	405	41.3	Ref.
Mothers earning less than \$15,999 per year, between \$16,000-24,999 per year, or between \$25,000-39,999 per year were less likely to seek dental care than mothers earning more than \$40,000.					
Parity					
Nulliparous	387	39.9	593	60.1	Ref.
Multiparous	427	40.0	673	60.0	1.00 (0.91, 1.09)
Mothers who had previously given birth to more than once were equally as likely to seek dental care as mothers who never had given birth.					
Pregnancy Intention					
Intended	547	44.9	705	55.1	Ref.
Unintended	256	33.1	541	66.9	1.21[†] (1.11, 1.33)
Mothers having unintended pregnancies were less likely to seek dental care than mothers with intended pregnancies.					
Trimester of Prenatal Care Entry					
First	736	44.0	1024	56.0	Ref.
Later	81	18.4	253	81.6	1.46[†] (1.35, 1.58)
Mothers beginning prenatal care after the first trimester were less likely to seek dental care than mothers beginning prenatal care in the first trimester.					
Prenatal insurance					
Private/HMO	616	51.4	664	48.6	Ref.
Medicaid	129	21.7	448	78.3	1.61[†] (1.47, 1.77)
Other	57	21.8	139	78.2	1.61[†] (1.44, 1.80)
Mothers who used Medicaid or other source of prenatal insurance were less likely to seek dental care than mothers using private/HMO insurance.					
Source of Prenatal Care					
Private physician/HMO	631	47.8	788	52.2	Ref.
	61	20.5	220	79.5	1.52[†]

Health department/community health center	66	29.8	141	70.2	(1.38, 1.68)
Hospital clinic	45	33.3	83	66.7	1.35[†] (1.18, 1.54)
Other					1.28[†] (1.08, 1.52)
Mothers who visited a health department/community health center, hospital clinic, or other source for prenatal care were less likely to seek dental care than mothers who went to a private physician/HMO.					
Smoked last three months of pregnancy?					
Yes	82	30.2	174	69.8	1.19[†] (1.06, 1.34)
No	729	41.4	1079	58.6	Ref.
Mothers who smoked during the last three months of pregnancy were less likely to seek dental care than mothers who did not smoke.					
Infant's Birthweight (grams)					
Less than 2,500	255	36.3	446	63.7	1.06 (0.98, 1.16)
2,500 or greater	561	40.2	827	59.8	Ref.
Mothers who gave birth to babies less than 2,500 grams were equally as likely to seek dental care as mothers giving birth to babies 2,500 grams or greater.					
Gestational Age (weeks)					
Less than 38	254	33.9	457	66.1	1.12[†] (1.02, 1.24)
38 or greater	563	41.1	821	58.9	Ref.
Mothers who gave birth to babies less than 38 weeks in gestation were less likely to seek dental care than mothers giving birth to babies greater than 38 weeks in gestation.					
Diabetes					
Yes	48	28.8	97	71.2	1.21[†] (1.05, 1.39)
No	766	41.1	1163	58.9	Ref.
Mothers with diabetes were less likely to seek dental care than mothers without diabetes.					

[†] = significant at p = .05