



Colorado Department  
of Public Health  
and Environment

# BRIEF

## HEALTH STATISTICS SECTION

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### Health Risk Behaviors and Mortality Rates in the San Luis Valley: Results from the Behavioral Risk Factor Surveillance System and Vital Statistics Data, 1997

The Colorado Behavioral Risk Factor Surveillance System (BRFSS) is an ongoing statewide telephone survey designed to monitor the prevalence of health behaviors and preventive health practices associated with the leading causes of premature death, disability, and disease. While the BRFSS provides reliable statewide estimates of various health behaviors, the sample reflects the state population and 80 percent of respondents reside in the urbanized Front Range areas of Colorado. Therefore, from June to September in 1997, a special point-in-time survey was conducted to understand the health risks and access to health care for adults ages 18 to 64 in the San Luis Valley (Alamosa, Conejos, Costilla, Mineral, Rio Grande, and Saguache counties). This survey used the same methodology and many of the same questions as the 1997 statewide BRFSS. In this report, prevalence estimates for health behaviors and preventive health practices of adults age 18 to 64 in the San Luis Valley are compared to estimates derived for all other counties in the state. In addition to the BRFSS data, vital statistics cause-of-death data are presented for the San Luis Valley and the rest of the state.

#### Methodology

The chi-square statistic was used to determine whether differences between the San Luis Valley and the remainder of the state were statistically significant. The Cochran-Mantel Haenszel chi-square statistic was used to determine whether differences between the two regions were statistically significant, controlling for the uneven distributions of poverty level and ethnicity between the two regions.

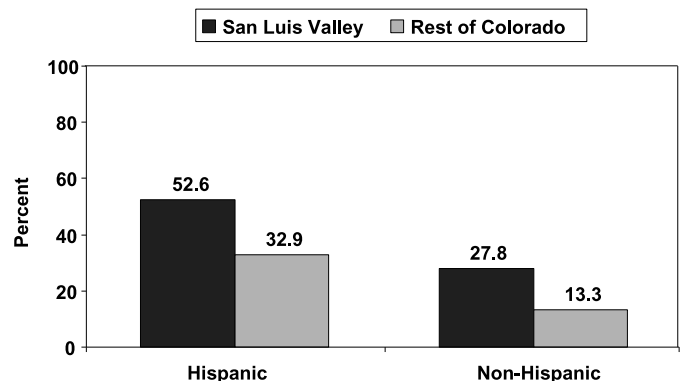
People with low incomes have mortality rates that are twice the rates of people with incomes above the poverty level<sup>1</sup>. For this report, federal poverty guidelines were used to calculate poverty level based on the number of people in the household and the reported household income from all sources. Respondents were assigned as having household incomes below or above 185 percent of the federal poverty level. Because income was asked in categories, some respondents could not be placed with certainty in either category. These respondents were designated as “at or near 185 percent of poverty.”

#### Sample Characteristics

The reported ethnicity, education, and poverty level distributions of respondents differed across the two areas (see

Table 1, next page). Compared to the rest of the state, the San Luis Valley had a higher proportion of Hispanics and a higher proportion of respondents (Hispanic and non-Hispanic) with incomes below 185 percent of poverty (see Figure 1). In both areas, Hispanics were more likely than non-Hispanics to have incomes below 185 percent of poverty; these differences were statistically significant.

**Figure 1. Proportion\* of respondents below 185% of federal poverty level by ethnicity and area of the state: Colorado BRFSS, 1997**



Note: Differences by both ethnicity and area of the state are statistically significant.  
\*Weighted percentage based on the probability of selection.

**Table 1. Respondent characteristics of the San Luis Valley and the remainder of the state: Colorado BRFSS, 1997**

Characteristic	San Luis Valley (%*) N=1012	Remainder of State (%*) N=1463
<b>Age</b>		
18-24	17.6	14.2
25-34	21.2	24.7
35-44	26.8	28.8
45-54	20.8	20.2
55-64	13.6	12.0
<b>Gender</b>		
Male	49.7	50.3
Female	50.3	49.7
<b>Ethnicity**</b>		
Hispanic	42.6	13.9
Non-Hispanic	57.4	86.1
<b>Education**</b>		
Less than high school	12.0	9.0
High school graduate	36.9	25.8
Some college	51.2	65.2
<b>Poverty Level**</b>		
Below 185% of poverty	38.6	15.9
At or near 185% of poverty	15.4	12.2
Above 185% of poverty	46.0	71.9

\*weighted percentage based on probability of selection

\*\*difference between the two areas is significant at  $p < .05$

### Health Status

Adults in the San Luis Valley were significantly more likely to report that their health was “fair” or “poor” (14.8 percent) compared to adults in the rest of the state (8.1 percent). Similar to previous research findings,<sup>2</sup> Hispanics in both areas were more likely than non-Hispanics to report “fair” or “poor” health status. The difference in reported health status between the two areas remained statistically significant even after controlling for the higher proportion of Hispanics in the San Luis Valley, but no difference was observed after controlling for poverty level. In both areas, older respondents and those with incomes below 185 percent of poverty were more likely to report “fair” or “poor” health status.

### Health Insurance

Significant differences in health care coverage by age, poverty level, and ethnicity existed between the San Luis Valley and the rest of the state. The proportion of uninsured adults in the San Luis Valley was almost twice the proportion in the remainder of the state; this difference

remained significant even after separate controls for the higher proportion of Hispanics and the higher rate of poverty in the San Luis Valley. In both regions, younger residents and those living below 185 percent of poverty were more likely to lack health insurance. Regional differences played a more important role than poverty level, as the proportion of uninsured adults in the San Luis Valley with incomes above 185 percent of poverty was almost twice that of respondents in the same income group in the rest of the state.

### Cardiovascular Disease Risk Factors

BRFSS data can be used to estimate the prevalence of several cardiovascular disease risk factors including overweight, current cigarette use, hypertension, high blood cholesterol, and diabetes.

Overweight is defined as a Body Mass Index (BMI=weight in kilograms/height in meters<sup>2</sup>) of 27.3 or higher for females and 27.8 or higher for males. Compared to the rest of the state, residents of the San Luis Valley were significantly more likely to be overweight. This difference remained statistically significant even after controlling for the higher rate of poverty in the San Luis Valley, but was no longer statistically significant after controlling for the larger proportion of Hispanics in the region.

Current smokers were identified as those respondents who had smoked at least 100 cigarettes in their lives and who currently smoked. The smoking rate was similar for all residents 18-64 in the San Luis Valley compared to the rest of the state. However, the smoking rate was lower for Valley residents above 185 percent of poverty and non-Hispanic residents compared to their counterparts in the rest of the state.

Respondents with hypertension were identified as those who had been told they had high blood pressure. The percentage of respondents with high blood pressure was similar in both areas. In both the San Luis Valley and the remainder of the state, the prevalence of hypertension increased with age and with income level.

The proportion of respondents who had been told their blood cholesterol was high was significantly lower in the San Luis Valley. However this difference disappeared after controlling for the disparity in blood cholesterol

**Table 2. Health behaviors by area of the state, age, poverty level, and ethnicity: Colorado BRFSS, 1997**

Health Behavior	Age						Poverty Level			Ethnicity	
	Total	18-24	25-34	35-44	45-54	55-64	Below 185%	Near 185%	Above 185%	Hispanic	Non-Hispanic
<b>Self-reported health status of "Fair" or "Poor"</b>											
San Luis Valley	<b>14.8</b>	9.2	9.9	11.7	<b>21.1</b>	<b>26.0</b>	23.1	10.1	8.4	20.7	9.8
Remainder of state	<b>8.1</b>	4.3	4.4	7.4	<b>12.6</b>	<b>14.6</b>	17.8	8.6	6.2	14.0	7.1
<b>No health insurance</b>											
San Luis Valley	<b>26.5</b>	30.4	<b>32.2</b>	<b>27.5</b>	<b>18.6</b>	<b>23.0</b>	40.7	23.2	<b>13.5</b>	34.7	<b>20.2</b>
Remainder of state	<b>14.2</b>	26.6	<b>15.9</b>	<b>14.6</b>	<b>7.0</b>	<b>7.3</b>	35.4	21.6	<b>7.7</b>	29.6	<b>11.8</b>
<b>Overweight</b>											
San Luis Valley	<b>29.0</b>	17.1	<b>34.8</b>	26.6	29.7	<b>38.7</b>	32.7	23.6	29.9	32.3	26.3
Remainder of state	<b>24.7</b>	14.1	<b>19.1</b>	28.4	31.9	<b>27.5</b>	25.9	24.5	24.7	31.2	23.7
<b>Current smoker</b>											
San Luis Valley	22.4	21.3	23.0	23.4	25.5	16.4	31.3	22.2	<b>13.3</b>	28.2	<b>18.0</b>
Remainder of state	24.6	31.1	25.0	25.4	21.0	20.1	37.7	31.7	<b>20.2</b>	24.8	<b>24.6</b>
<b>Ever been told blood pressure is high</b>											
San Luis Valley	16.5	7.4	9.1	10.9	26.5	35.7	15.1	15.1	19.2	17.2	16.1
Remainder of state	16.4	5.7	11.3	12.9	22.3	38.2	11.5	19.9	17.8	14.0	16.9
<b>Ever been told blood cholesterol is high</b>											
San Luis Valley	<b>13.2</b>	1.9	<b>4.5</b>	11.9	21.5	30.5	9.8	9.4	18.1	12.0	<b>14.0</b>
Remainder of state	<b>17.6</b>	2.6	<b>10.6</b>	16.2	27.2	35.1	10.9	12.2	20.5	12.2	<b>18.4</b>
<b>Ever been told they have diabetes</b>											
San Luis Valley	3.6	**	0.5	2.1	6.5	<b>11.9</b>	3.5	3.6	3.7	4.8	2.7
Remainder of state	2.9	0.5	1.6	2.9	4.8	<b>4.9</b>	4.3	2.5	2.7	4.7	2.6
<b>Blood pressure checked within past 2 years</b>											
San Luis Valley	89.8	94.9	88.2	<b>85.8</b>	91.4	91.7	88.4	88.5	92.0	89.8	<b>89.8</b>
Remainder of state	92.5	91.5	91.2	<b>93.0</b>	93.7	93.3	91.1	86.8	94.0	87.6	<b>93.3</b>
<b>Blood cholesterol checked within past 5 years</b>											
San Luis Valley	<b>56.3</b>	32.4	<b>43.6</b>	<b>55.0</b>	76.0	<b>79.2</b>	40.5	62.3	71.4	49.0	<b>61.9</b>
Remainder of state	<b>66.5</b>	43.9	<b>56.8</b>	<b>67.8</b>	78.4	<b>88.1</b>	45.7	59.4	73.7	54.5	<b>68.4</b>
<b>Do not always use safety belt</b>											
San Luis Valley	<b>48.1</b>	58.2	<b>53.9</b>	<b>34.7</b>	<b>50.8</b>	<b>48.4</b>	49.8	<b>56.3</b>	<b>43.3</b>	<b>50.6</b>	<b>46.0</b>
Remainder of state	<b>28.5</b>	43.9	<b>26.6</b>	<b>25.6</b>	<b>25.9</b>	<b>25.7</b>	40.1	<b>31.7</b>	<b>25.3</b>	<b>36.6</b>	<b>27.2</b>
<b>Tested smoke detector in past 6 months</b>											
San Luis Valley	<b>54.3</b>	60.4	54.2	54.6	<b>51.0</b>	51.4	51.4	55.7	57.6	54.5	<b>54.0</b>
Remainder of state	<b>61.5</b>	55.0	63.1	61.0	<b>64.3</b>	62.4	59.3	65.2	61.4	61.5	<b>61.6</b>
<b>Seen a dentist in last year</b>											
San Luis Valley	<b>57.5</b>	60.4	47.8	<b>60.1</b>	<b>64.7</b>	<b>51.9</b>	41.8	59.2	69.1	56.3	<b>58.8</b>
Remainder of state	<b>67.2</b>	58.5	57.6	<b>71.9</b>	<b>77.0</b>	<b>69.3</b>	50.4	63.3	72.3	59.0	<b>68.5</b>

Bold=difference between San Luis Valley and remainder of the state is significant at  $p < .05$  before adjusting for poverty level or ethnicity.

\*\*Figure not reliable by BRFSS standards ( $n < 50$ ).

screening between the two areas (see Routine Health Checks, on page 4). Moreover, after separate adjustments for the higher rate of poverty and higher proportion of Hispanics in the San Luis Valley, the difference in the prevalence of high blood cholesterol was no longer statistically significant.

The percentage of respondents with diabetes was similar in both areas. However, the proportion of adults ages 55-64 with diabetes was over two times higher in the San Luis Valley than the rest of the state. In the San Luis Valley and the rest of the state, younger adults and non-Hispanic adults were less likely to report having been told they had diabetes.

## Routine Health Checks

Most residents in both areas reported having their blood pressure checked within the past two years. There were no reported differences between regions in the prevalence of Hispanics having their blood pressure checked; however, non-Hispanics in the San Luis Valley were significantly less likely to have their blood pressure checked than their counterparts in the rest of the state.

Respondents in the San Luis Valley were significantly less likely to have had their blood cholesterol checked in the past five years compared to respondents in the rest of the state. This difference remained significant for most age groups and for non-Hispanics.

Respondents in both areas with incomes below 185 percent of poverty were significantly less likely than those with higher incomes to have had their cholesterol checked. In addition, Hispanics in both areas were less likely than non-Hispanics to report having their blood cholesterol checked.

## Safety

Respondents in the San Luis Valley were significantly less likely to report always wearing safety belts when driving or riding in a car. Both males and females in the San Luis Valley were significantly less likely than their counterparts in the rest of the state to always wear their safety belts. In both regions, males were significantly less likely than females to always wear safety belts (43.7 percent vs. 59.9 percent in the San Luis Valley and 67.8 percent vs. 75.2 percent in the rest of the state), and respondents 18-24 years

old were the least likely to always wear safety belts.

The prevalence of having a smoke detector that had been tested in the past six months was significantly lower in the San Luis Valley compared to the rest of the state.

## Dental Care

Compared to residents in the San Luis Valley, residents in the rest of the state were significantly more likely to have seen a dentist in the last year. The overall difference between the two areas remained statistically significant even after controlling for the higher proportion of Hispanics living in the San Luis Valley and the higher rate of poverty among residents of the area. In both areas, those with incomes below 185 percent of poverty were significantly less likely to have seen a dentist in the last year compared to those with higher incomes.

## Women's Cancer Screening

Significant differences in breast cancer screening existed between residents in the San Luis Valley and the rest of the state by age, poverty level and ethnicity (See Table 3). The proportion of women ages 50-64 who had both a mammogram and clinical breast exam in the past two years was significantly lower in the San Luis Valley (62.2 percent) compared to the remainder of the state (75.8 percent).

The proportion of women who had a Pap test in the past three years was similar in both regions. Also in both regions, respondents with lower incomes were less likely to have had a Pap test in the past three years.

**Table 3. Women's cancer screening by area of the state, age, poverty level, and ethnicity: Colorado BRFSS, 1997**

Health Behavior	Total	Age				Poverty Level			Ethnicity	
		18-24	25-34	35-49	50-64	Below 185%	Near 185%	Above 185%	Hispanic	Non-Hispanic
<b>Mammogram and Clinical Breast Exam in past 2 years</b>										
San Luis Valley	—	—	—	—	<b>62.2</b>	**	**	<b>72.5</b>	64.5	<b>61.7</b>
Remainder of state	—	—	—	—	<b>75.8</b>	**	**	<b>85.3</b>	**	<b>78.2</b>
<b>Pap Test in past 3 years</b>										
San Luis Valley	88.3	85.1	93.0	89.4	82.4	86.3	83.3	94.6	90.2	86.7
Remainder of state	89.5	82.7	93.9	89.4	88.4	86.9	84.6	93.4	82.7	90.6

Bold=difference between San Luis Valley and remainder of state is significant at P < .05 before adjusting for poverty level or ethnicity.

\*\*Figure not reliable by BRFSS standards (n<50).

## Mortality data

The annual average number of deaths and age-adjusted mortality rates for the leading causes of death from 1994-1998 are provided for the San Luis Valley and the rest of the state in Table 4. Age-adjusted rates are standardized to the age distribution of a particular population so that the rates can be compared over time or among different geographical areas. Annual averages provide a more reliable estimate of mortality data when analyzing less populated areas of the state. From 1994-1998, cardiovascular disease was the leading cause of death in both areas. Only the lung cancer mortality rate was statistically significantly lower in the San Luis Valley compared to the rest of the state. Mortality rates for cardiovascular disease, unintentional

injuries, motor vehicle injuries, pneumonia/influenza, diabetes, chronic liver disease/cirrhosis, and homicide were all statistically significantly higher in the San Luis Valley compared to the rest of the state. In most cases, behavioral risks described in the BRFSS are not reflected in the current mortality data (1994-1998) because those behaviors can take many years to effect mortality rates. However, some behaviors, such as a significantly lower rate of seat belt use in the San Luis Valley, can have immediate impact on mortality rates. The significantly higher proportion of adults not using seat belts in the San Luis Valley appears to be reflected in the significantly higher motor vehicle mortality rate for the area.

**Table 4. Age-adjusted death rates and 95 percent confidence intervals, San Luis Valley and the remainder of the state, 1994-1998 annual averages**

Underlying Cause of Death	San Luis Valley, 1994-1998 Annual Average			Remainder of State, 1994-1998 Annual Average		
	Number	Age-Adjusted Rate	95% Confidence Interval	Number	Age-Adjusted Rate	95% Confidence Interval
All Causes*	385	516.8	(490.8-542.7)	25,013	434.3	(431.7-436.9)
Cardiovascular Disease*	140	159.3	(145.9-172.8)	8,840	133.6	(132.2-135.0)
Malignant Neoplasms	66	95.1	(83.9-106.3)	5,527	106.7	(105.4-108.0)
Lung Cancer*	11	17.6	(12.7-22.5)	1,328	26.7	(26.1-27.4)
Female Breast Cancer	4	16.1	(9.0-23.3)	450	16.7	(16.0-17.4)
Chronic Obstructive Pulmonary Disease	23	26.4	(21.0-31.7)	1,626	27.5	(26.9-28.2)
Unintentional Injuries*	28	56.1	(46.3-65.9)	1,407	31.8	(31.0-32.6)
Motor Vehicle*	17	37.5	(29.3-45.6)	634	16.4	(15.9-17.0)
All Others	11	18.6	(13.2-24.0)	773	15.4	(14.9-15.9)
Pneumonia and Influenza*	18	17.5	(13.2-21.8)	921	12.2	(11.8-12.6)
Suicide	9	19.1	(13.2-25.0)	625	15.2	(14.7-15.8)
Diabetes Mellitus*	11	14.4	(10.3-18.6)	516	9.4	(9.0-9.8)
Chronic Liver Disease and Cirrhosis*	7	14.3	(9.4-19.2)	330	7.4	(7.0-7.8)
Nephritis, Nephrosis, Nephrotic Syndrome	6	6.0	(3.4-8.6)	248	3.8	(3.5-4.0)
Homicide and Legal Intervention*	5	10.9	(6.5-15.3)	196	5.3	(5.0-5.7)

Rates are deaths per 100,000 population and include deaths to residents of all ages.

The 1940 standard population was used in developing age-adjusted death rates.

\*Difference between San Luis Valley and remainder of state is significant at  $p < .05$ .

## Summary

Health disparities between those with low incomes and those with higher incomes are almost universal for all dimensions of health. Just as poor health is more likely among persons of low income, so are some of the major risk factors for poor health.<sup>3</sup> For example, higher than average rates of obesity and hypertension, which are major risk factors for heart disease and stroke, have been linked directly with low income status.<sup>4</sup> These results show that residents in the San Luis Valley, where there is a higher rate of poverty and a higher proportion of Hispanics compared to the rest of the state, are significantly more likely to report “fair” or “poor” health status, lack health insur-

ance, and be overweight. In addition, they are significantly less likely to always use safety belts, have and test smoke detectors, routinely have their blood pressure and cholesterol checked, and to have seen a dentist in the last year. These indicators of poorer health status also appear to be reflected in significantly higher mortality rates in the San Luis Valley for many of the ten leading causes of death. In order to eliminate disparities and improve the health, health behaviors, and overall quality of life for residents in the San Luis Valley, this region should be made a priority in Colorado for the development of appropriate prevention and intervention strategies.

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## References

<sup>1</sup>Amler, R.W. & Dull, H.B. 1987. *Closing the Gap: The Burden of Unnecessary Illness*. New York: Oxford University Press.

<sup>2</sup>Shetterly, S.M., Baxter, J., Mason, L.D., & Hamman, R.F. 1996. “Self-rated Health Among Hispanic vs. Non-Hispanic White Adults: The San Luis Valley Health and Aging Study.” *American Journal of Public Health* 86 (12): 1798-1801.

<sup>3</sup>U.S. Department of Health and Human Services. 1990. *Healthy People 2000: National Health Promotion and Disease Prevention Objectives*. Washington, D.C.: U.S. Government Printing Office.

<sup>4</sup>Public Health Service. 1988. *The Surgeon General's Report on Nutrition and Health*. Washington, D.C.: U.S. Dept. of Health and Human Services.

<sup>5</sup>U.S. Department of Health and Human Services. 1998. “Health in America Tied to Income and Education.” News Release. Public use documentation. <http://www.cdc.gov/nchswww/releases/98news/98news/huspr98.htm> July 30, 1998.