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Health and Health Care in Colorado

September 2005

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Prepared by the Colorado Health Institute (CHI)

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Acknowledgments

This report combines findings of three previous reports conducted for HealthONE Alliance, two of which were done by the Colorado Health Institute (CHI) and the third by consultant Sarah Schulte. They include:

Toward an Understanding of the Health Threats and Health Care Needs of Colorado Communities was designed to help the Alliance better understand Colorado's health and health care needs at the community level. Through the administration of a community health survey, CHI provided a snapshot of community-identified health threats, community responses, and ways in which philanthropy can provide leadership in supporting local planning and service delivery efforts. The survey findings presented a story of community health needs as told by community leaders and health care providers in 23 communities around Colorado. Jeff Bontrager, research analyst, was the lead CHI staff for the survey and its subsequent analysis.

The second CHI document examined Colorado's changing demographics, the current supply of physicians and medical technologists, the supply pipeline, undergraduate and graduate training programs, and the role HealthONE Alliance's graduate medical education (GME) programs play in supplying health professionals to meet the state's current and future needs for these primary care health professionals. CHI staff interviewed GME program directors, as well as state and national health care workforce experts; examined demographic trends; analyzed state and regional health status statistics; and identified social and environmental factors that affect the supply and demand for these professionals. Amy Downs, CHI senior research analyst, was the primary author of the supply and demand analysis.

External Assessment of Health and Health Care in Colorado: Summary Report identified the health status and health threats to Coloradans at a state population level. The report also described the role and contributions of health care agencies and organizations in the state, including health foundations. Sarah Schulte of Schulte Consulting in Boulder analyzed published data and resource documents to describe Colorado's health and health care institutions, focusing on data for the years 2000 through 2003.

Pamela Hanes, PhD, CHI president and CEO; Sherry Freeland Walker, communications director; and Kindle Fahlenkamp-Morell, communications associate, were responsible for the organization, design and production of this report. We wish to acknowledge the analytical and mapping support of Jeff Bontrager, research analyst, and Todd Hockenberry, graduate intern, for their assistance in preparing the graphs, charts, tables and maps included in this report.

This report combines findings from three previous reports completed for HealthONE Alliance by the Colorado Health Institute (CHI) and consultant Sarah Schulte. Together, these reports provide a look at what the data say, what the experts say and what Coloradans say about health and health care in our state. The findings present a picture of a state whose population as a whole is healthier than U.S. averages on a number of important indicators, but which also contains significant disparities among certain population groups. These disparities range from disease prevalence to services provided to health insurance coverage, and present challenges for state and local policy decision-makers, health care providers and private philanthropy.

What the Data Say…

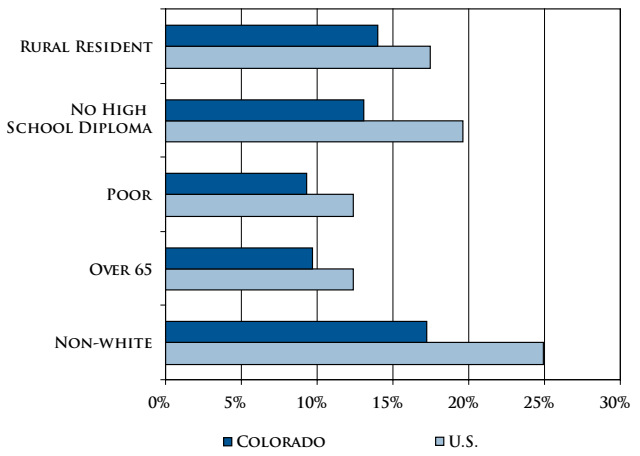
Colorado's population tends to be whiter, younger, higher-income, more highly educated and more urbanized than the rest of the country (Fig. 1) – characteristics that generally portend more positive health status for a population.

Because of these demographic factors, Colorado's health status indicators are generally better than the rest of the nation. In particular, Colorado has among the lowest death rates in the nation from heart disease, cancer and stroke (Fig. 2).

This positive profile, however, masks the fact that health disparities exist between population groups in the state, based largely on race, ethnicity and where in the state an individual lives.

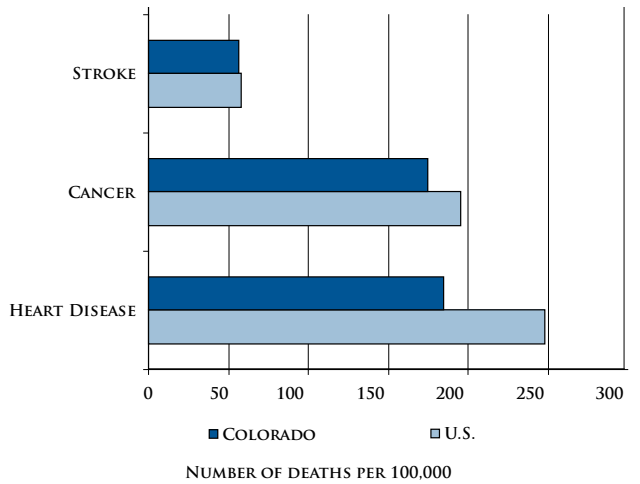
The population groups most at risk for poor health outcomes are growing, notably the elderly and individuals of Latino (Hispanic) descent (Fig. 3). The Colorado population age 65 years and older is expected to increase almost 50 percent by 2020, while Hispanics will make up 25 percent of the state's population by 2020.

Figure 1: Demographic characteristics, Colorado and U.S., 2000



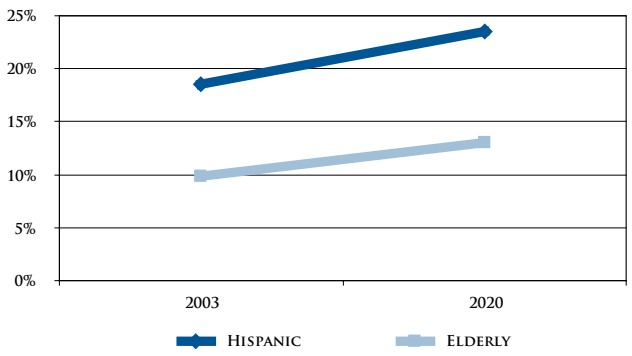
Source: U.U.S. Census, 2000.

Figure 2: Death rates from heart disease, cancer, and stroke, Colorado and U.S., 2002



Source: Colorado Department of Public Health and Environment, 2003; U.S. Centers for Disease Control and Prevention, 2004.

Figure 3: Projected change in percent of elderly and Hispanic population, Colorado, 2003-20



Source: Colorado Demography Office, 2004; U.S. Census Bureau reports, 2004 and 2005.

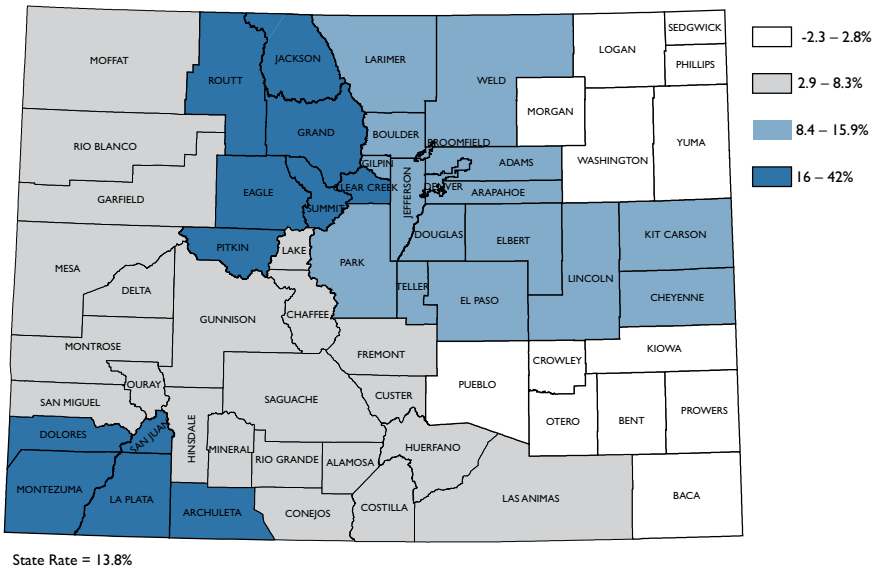
THE ELDERLY

The highest proportion of the 65+population lives in rural areas of Colorado. Geographic regions that currently have a relatively low percentage of individuals over the age of 65 are projected to experience significant growth in older populations over the next five years.

According to the Colorado Demography Office, approximately 9.8 percent of the population in Colorado in 2005 is over 65 years of age. Map 1 shows the anticipated growth of this population between 2005 and 2010 by the state's 14 planning and management regions (PMRs, designated in 1977 for planning purposes). Interestingly, those regions with the highest proportion of individuals over 65 years in 2005 are projected to have some of the lowest rates of growth through 2010. Conversely, the counties with the lowest rates in 2005 (Routt, Jackson, Grand, Eagle, Summit, Pitkin) are projected to be among those with the highest rates of growth between 2005 and 2010. Among other impacts, an increase in the number of community residents over age 65 suggests an increased demand for primary care providers as this age group is at higher risk of developing chronic health problems. Findings from the combined HealthONE reports include:

- Many of the PMRs projected to have higher rates of growth in the 65+ population are designated as health profession shortage areas, (see Map 5), indicating the number of primary care physicians relative to the size of population does not meet traditional benchmarks for adequate coverage.
- The PMRs with the highest percentage of individuals over the age of 65 have very few physicians with specialization in geriatrics.

Map1: Growth of the population 65 and over, by planning and management region, 2005-10



State Rate = 13.8%

Source: Colorado Demography Office. CHI analysis and mapping.

The Hispanic Population

Colorado's Hispanic (Latino) population is also growing rapidly (Map 2) and is projected to reach one-quarter of the state's population by 2020. Hispanics are more likely than other ethnic and racial groups to experience certain risk factors, including obesity and teen pregnancy, and are more likely to die from diabetes, motor vehicle crashes and cervical cancer.

A significant number of Hispanic households also are "linguistically isolated,"[1] particularly in metropolitan areas of the state. Additionally, a significant percentage of monolingual Spanish speakers reside in many of Colorado's rural communities. In light of these risk factors and higher prevalence of certain diseases, key informants interviewed by CHI suggested the following:

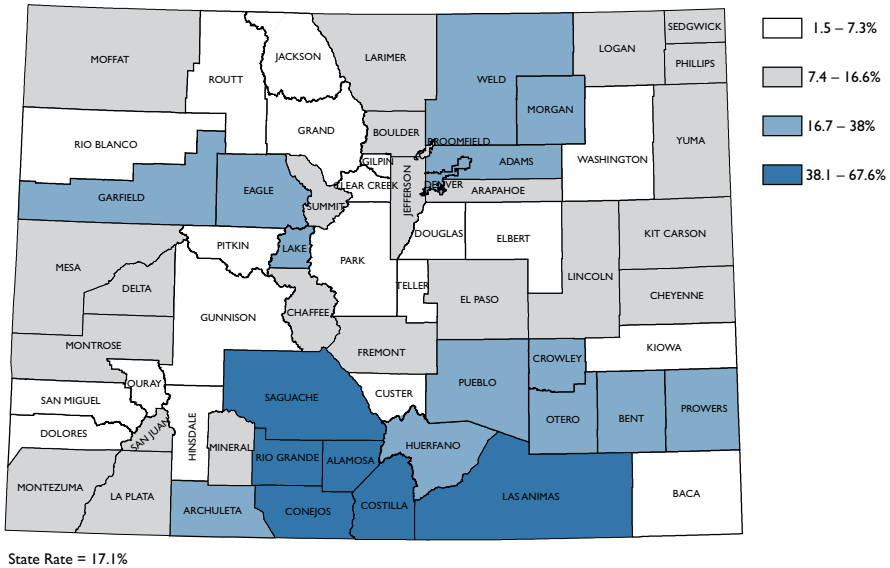
- An increased number of primary care providers with clinical and linguistic competencies are needed to manage chronic diseases in culturally appropriate ways.
- No data currently exist on the number of Hispanic primary care providers practicing in Colorado. Yet CHI research has identified a growing need for practitioners who not only speak Spanish but also have the ability to provide culturally appropriate care to this growing population of Coloradans.

Rural Residents

Analyses of the geographic distribution of chronic disease prevalence, risk factors and mortality rates indicate that rural areas of the state have poorer health status, suggesting need for a better distribution of public health interventions and primary health care providers. These disparities are especially evident in the eastern plains and southern regions of the state.

- The incidence of obesity, diabetes and hypertension is relatively high in the eastern part of the state, and many of the counties in this region lack a sufficient number of primary care providers, according to the Colorado Department of Public Health and Environment (CDPHE), (see Map 5).
- Rural residents in the southern part of the state experience high rates of death from respiratory disease and high rates of diabetes, both chronic health problems that respond well to primary care interventions and disease management programs. This region also lacks a sufficient number of primary care providers, according to CDPHE.

Map 2: Percent of Hispanic Population by County, 2000



State Rate = 17.1%

Source: U.S. Bureau of the Census, Census 2000. CHI analysis and mapping.

Imminent health threats

Despite the state's generally positive health status profile, Colorado policy decision-makers and funders face challenges in three areas: suicide, respiratory disease and disease-specific health disparities.

Suicide

Mental illness and its related conditions are a major cause of death and disability in Colorado. The suicide rate in the state is nearly 50 percent higher than the national average (Fig. 4), and suicide is a leading cause of death for Coloradans under the age of 45 years.

Respiratory disease

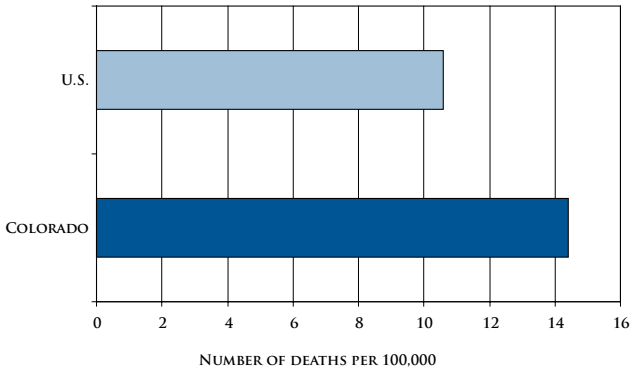
Rates of respiratory disease also are high in Colorado, despite the fact that the state has lower rates of smoking than the U.S. average. Colorado has higher rates than the nation as a whole for chronic obstructive pulmonary disease, adult asthma and flu requiring hospitalization for the elderly.

Table 1: Respiratory disease rates, Colorado and U.S., 2001-03

	Chronic obstructive pulmonary disease death rate, 2002	Adult asthma rate, 2003	Hospitalization for elderly patients with influenza, 2001
Colorado	54 per 100,000	8.3%	15.2 per 100,000 elderly
U.S.	44 per 100,000	7.7%	9.8 per 100,000 elderly

Source: Colorado Department of Public Health and Environment, 2003; U.S. Centers for Disease Control and Prevention, 2004; U.S. Agency for Healthcare Research and Quality, 2005.

Figure 4: Suicide rates, Colorado and U.S., 2003



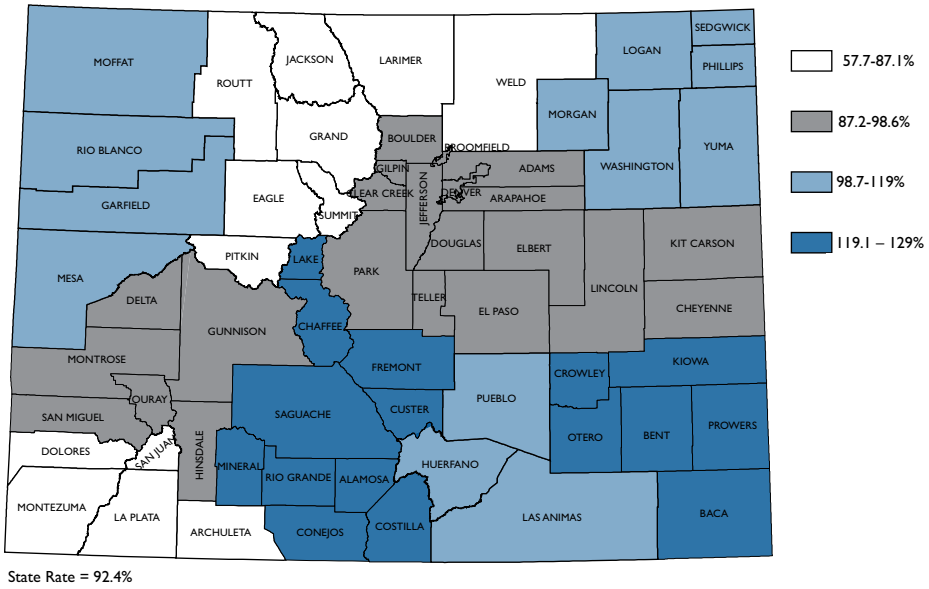
Sources: Colorado Department of Public Health and Environment, 2004; U.S. Centers for Disease Control and Prevention, 2005.

Suicide Facts

- In 2002, Colorado had the eighth highest suicide rate in the U.S.
- Suicide is the leading cause of injury death in Colorado. More people die by suicide than are killed in motor vehicle crashes. On average, 720 individuals die by suicide and 2,560 are hospitalized for attempted suicide each year.
- The age-adjusted suicide rate for males is almost four times higher than the rate for females.
- The majority of suicides in Colorado (68 percent) involve Caucasian males.
- Females age 15-24 years have the highest rate of attempted suicide.
- The majority of suicide deaths involve the use of a firearm (52 percent), while the majority of hospitalizations for suicide attempts involve a drug overdose (81 percent).

Source: Injury in Colorado, Colorado Department of Public Health and Environment, August 2005.

Map 3: Age-adjusted death rate per 100,000 population from respiratory disease by PMR, 2003

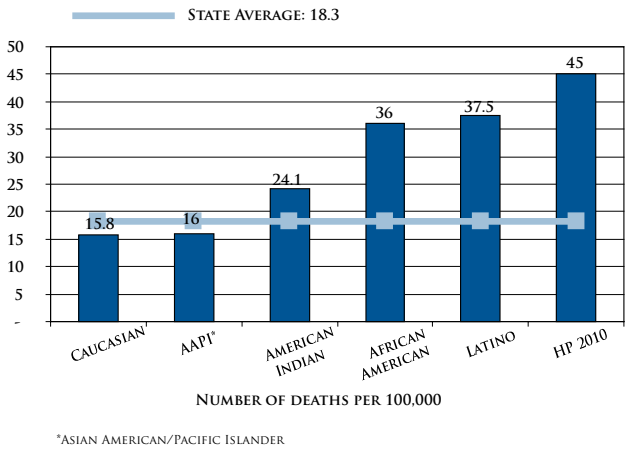


State Rate = 92.4%

Source: These data were supplied by the Health Statistics Section of the Colorado Department of Public Health and Environment, which specifically disclaims responsibility for any analysis, interpretations or conclusions it has not provided.

Health Disparities

Figure 5: Diabetes – Colorado age-adjusted death rates by race/ethnicity, five-year annual average



Source: Colorado Department of Health and Environment, Racial and Ethnic Health Disparities in Colorado 2005, p. 19.

Diabetes

Between Colorado's Hispanic and African American populations, many disease-specific health outcomes are poorer than those experienced by Caucasians. The statewide average diabetes death rate is 18.3 per 100,000 population; it is considerably higher, however, among minority groups. Latinos have the highest mortality rate from diabetes at 38 deaths per 100,000 population; African Americans have the second highest rate at 36 deaths per 100,000, followed by Native Americans at 24 deaths per 100,000 population. Although there is great disparity in diabetes rates among Colorado's population groups, the state's rates are still lower than the Healthy People 2010 objective for diabetes (Fig. 5).

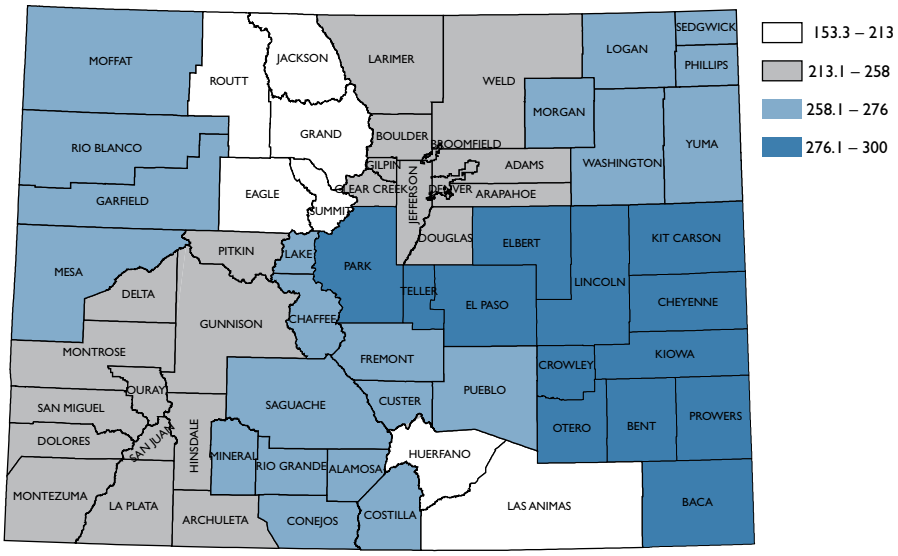
Cardiovascular disease

Cardiovascular disease is the leading cause of death in Colorado.[2] Map 4 summarizes the 2003 Colorado death rates from cardiovascular disease by PMR. In addition, Figures 6 and 7 summarize the five-year averaged mortality rates from heart disease and cerebrovascular

disease (stroke), a disease associated with cardiovascular disease (1998-2002).

African Americans have the highest mortality rate from cerebrovascular disease (Fig. 7) at 72 deaths per 100,000 population; followed by Caucasians with a rate of 57 per 100,000; Asian American/Pacific Islanders (AAPI) with a rate of 52 per 100,000; and Latinos with the lowest rate at 47 per 100,000 population. Rates for Colorado Caucasians and African Americans are higher than Healthy People 2010 objectives for both heart disease and stroke.

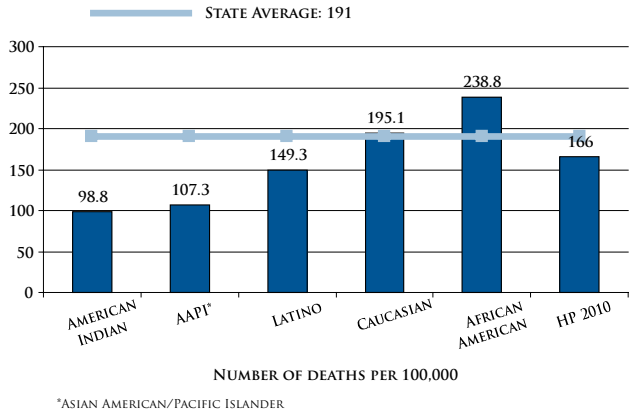
Map 4: Age-adjusted death rate (per 100,000 population) from cardiovascular disease, by PMR, 2003



State Rate = 257.4

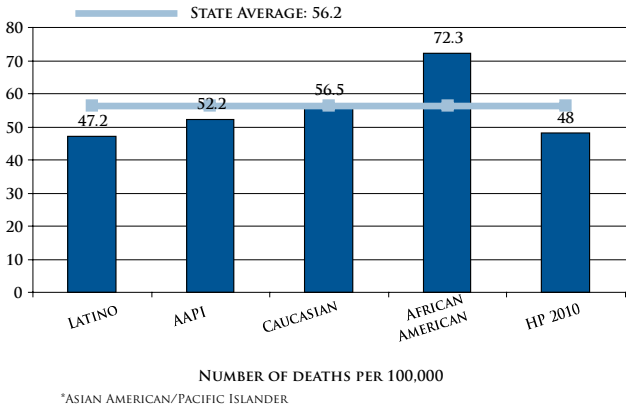
Source: These data were supplied by the Health Statistics Section of the Colorado Department of Public Health and Environment, which specifically disclaims responsibility for any analysis, interpretations or conclusions it has not provided.

Figure 6: Heart disease – Colorado age-adjusted death rates by race/ethnicity, five-year annual average, 1998-02



Source: Colorado Department of Public Health and Environment, *Racial and Ethnic Disparities in Colorado 2005,* p. 17.

Figure 7: Cerebrovascular disease – Colorado age-adjusted death rates by race/ethnicity, five-year annual average, 1998-02

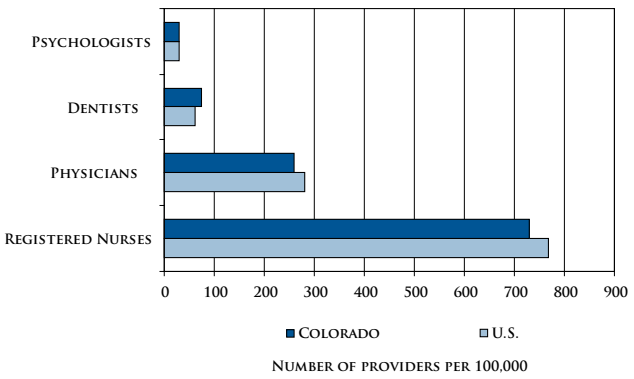


Source: Colorado Department of Public Health and Environment, *Racial and Ethnic Disparities in Colorado 2005*, p. 18.

Health Care System Characteristics

Health services in Colorado are provided by a blend of public and private health care providers and institutions. The public health system, comprising state and local health departments, works to improve health through population-based interventions such as health promotion and health education campaigns, preventive health services (e.g., immunizations), environmental protections and services intended to increase access to basic health care. Medical care services, provided by doctors, hospitals and other providers, are directed at improving the health of individuals. Long-term care includes an array of services provided to individuals with chronic health conditions and significant functional limitations who are unable to engage in activities of daily living without the assistance of others.

Figure 8: Number of providers per 100,000 population, Colorado and U.S., 2000



Source: U.S. Department of Health and Human Services, Health Resources and Services Administration, 2004.

Health care professionals

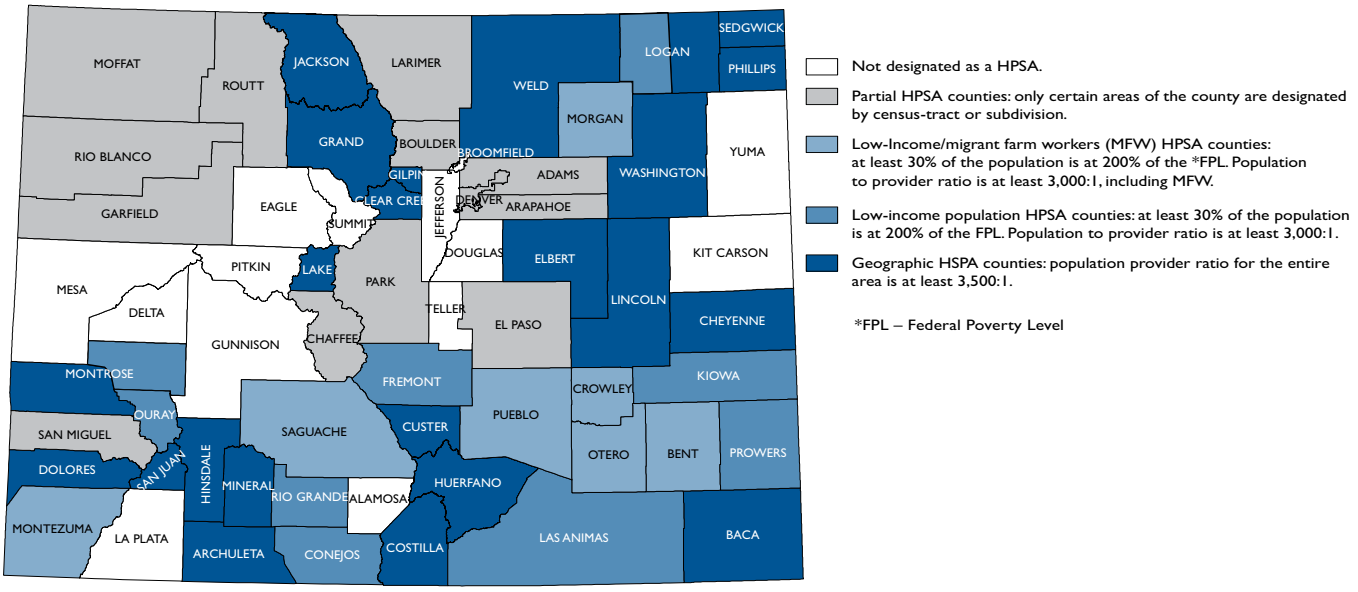
Colorado has rates per 100,000 population of nurses, physicians, dentists and psychologists that are comparable to the U.S. average (Fig. 8).

Certain geographic areas of the state however, have more difficulty recruiting and retaining health care providers than others. For example, over half of Colorado counties have a shortage of primary care physicians (Map 5). The state has 20 percent fewer geriatricians per 100,000 elders than the U.S. average. In addition, a relatively small proportion of Colorado physicians and dentists participate in the Colorado Medicaid program to a significant level, making it difficult for many Medicaid enrollees to find a health care provider willing to accept them as patients.

Based on the prevalence of chronic disease, behavioral risk factors, insurance status and health profession shortage areas, the most significant access challenges are found in Colorado's rural communities. A growing body of literature and research confirms the overall shortage of primary health care providers in rural areas is a significant health policy concern. A number of reasons have been put forth to explain why these shortages are most acutely felt in rural areas of the state.[3]

- The practice of primary care medicine in rural areas is more complex due to a general lack of specialists. For example, primary care physicians in rural areas often do not have the backup of local specialists in emergency situations, meaning they must rely on limited local resources until a patient can be transferred to a tertiary care center, often a considerable distance away.
- In many rural communities, in a family with two working spouses, the physician's spouse often has difficulty finding employment in his/her field.
- The social and professional isolation in rural communities has led many physicians to move to metropolitan areas.
- In 1999, women made up 46 percent of family practice graduating residents nationally, up from 19 percent in 1980. As women are less likely to pursue careers in rural areas, the supply of family physicians has been affected by this trend.[4]
- The perception that rural physicians work extremely long hours and are always on call has served as a disincentive to physicians choosing a rural practice site.

Map 5: Primary care health professional shortage areas (HPSAs)

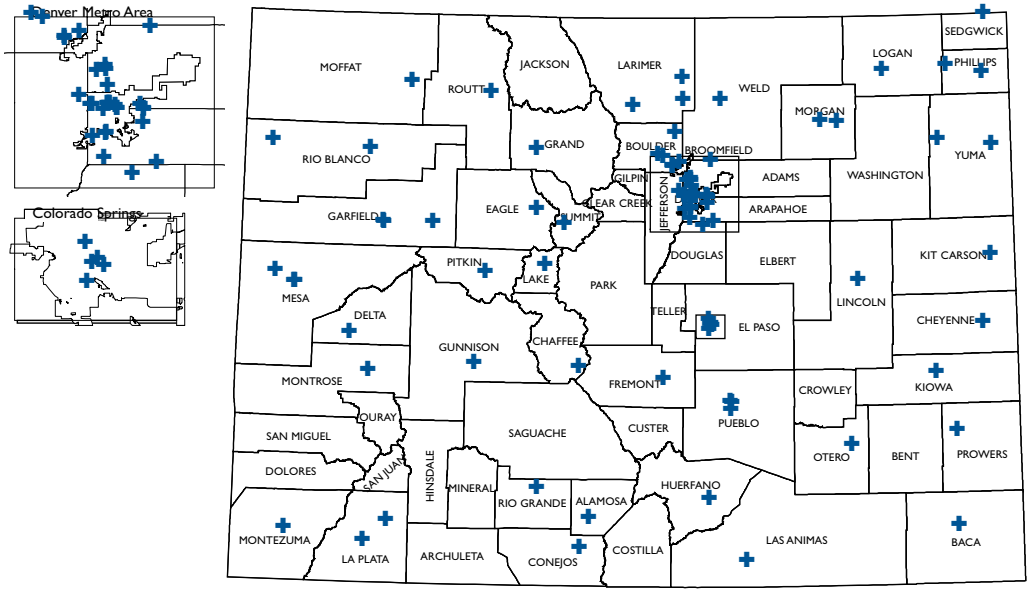


Source: These data were supplied by the Colorado Department of Public Health and Environment, which specifically disclaims responsibility for any analysis, interpretations or conclusions it has not provided.

Health care organizations

Colorado has 92 hospital facilities scattered across the state, including three federally supported facilities. Twenty of these hospitals are critical access facilities designed to improve health care in rural areas. The number of people who could potentially be served by each hospital varies considerably, ranging from a high of 122,000 in Larimer and Weld counties to a low of 9,200 in Logan, Morgan, Phillips, Sedgwick, Washington and Yuma counties – the northeast corner of the state.

Map 6: Colorado hospital locations



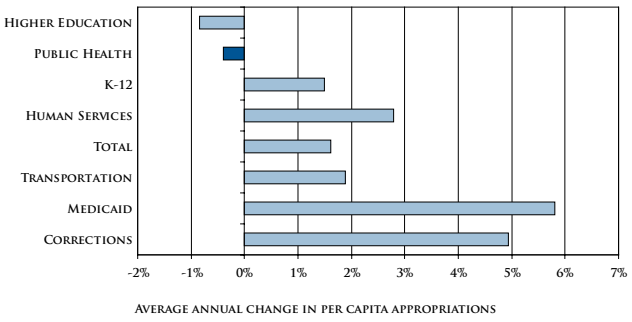
Sources: American Hospital Directory, Colorado Health and Hospital Association, Agape Center. Centrus was used to add the latitude/longitude, and population data were gathered from the Colorado Demography Office. CHI analysis and mapping.

Public health organizations

In 2003, Colorado was one of six states to assess the ability of the state and local public health systems to perform the 10 essential public health services (see box at right). The result of this assessment was that the Colorado Department of Public Health and Environment was competent in only two of the 10 essential public health services — diagnosing health problems and enforcing laws and regulations. Assessment of the 54 local public health agencies (Map 7) found that they were not competent in any of the 10 public health functions.

This less than stellar assessment of Colorado's public health system may be due, in part, to a reduced investment of state resources. Between 1992 and 2002, state per-capita funding for the public health system and higher education declined, while funding for other state programs increased (Fig. 9).

Figure 9: Average annual change in per-capita appropriations in Colorado, 1992-02



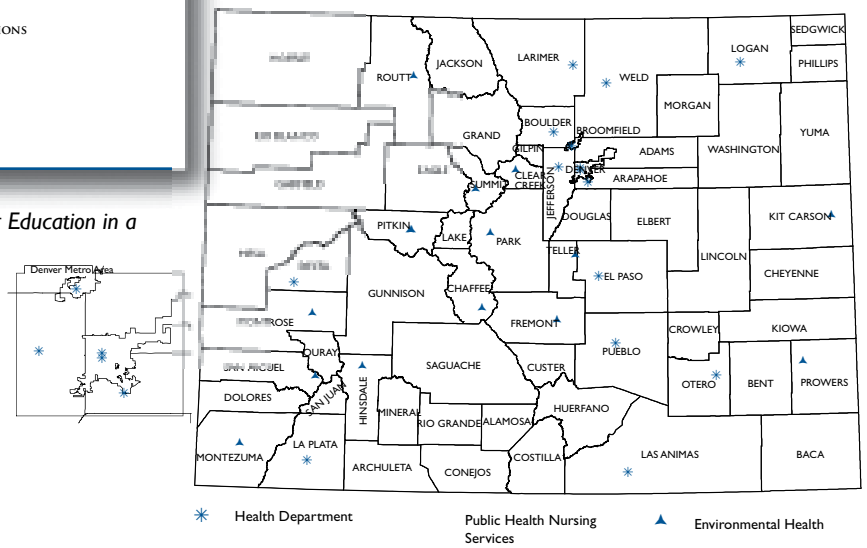
Source: Bell Policy Center, *Colorado Public Higher Education in a State of Crisis*, 2003.

The 10 essential public health services

- Monitor health status to identify and solve community health problems.
- Diagnose and investigate health problems and health hazards in the community.
- Inform, educate and empower people about health issues.
- Mobilize community partnerships and action to identify and solve health problems.
- Develop policies and plans that support individual and community health efforts.
- Enforce laws and regulations that protect health and ensure safety.
- Link people to needed personal health services and assure the provision of health care when otherwise unavailable.
- Assure a competent public health and personal health care workforce.
- Evaluate effectiveness, accessibility and quality of personal and population-based health services.
- Research for new insights and innovative solutions to health problems.

Excerpted from "The Essential Services of Public Health" by James A. Harrell, Office of Disease Prevention and Health Promotion, and Edward L. Baker, MD, MPH, Centers for Disease Control and Prevention and the Essential Services Work Group

Map 7: Local health departments in Colorado



Sources: American Hospital Directory, Colorado Health and Hospital Association, Agape Center. Centrus was used to add the latitude/longitude, and population data were gathered from the Colorado Demography Office. CHI analysis and mapping.

Health insurance coverage

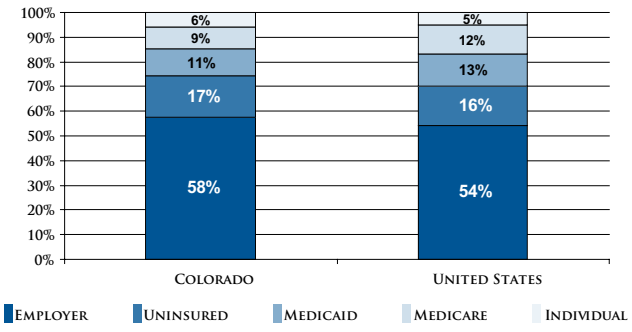
A higher percentage of Colorado's population is covered by employer-based health insurance than the national average (Fig. 10). Conversely, Colorado Medicaid is one of the leanest Medicaid programs in the country.

Meanwhile, approximately 17 percent of the population was uninsured in 2003, placing Colorado's uninsurance rate slightly above the national average. Over half of uninsured Coloradans are below 200% of the federal poverty level (Fig. 11). Most of the uninsured working-age adults in Colorado are employed (Fig. 12).

For those Coloradans who are insured by their employers, premiums are rising precipitously. Health insurance premium increases have been double-digit in Colorado for the past five years. A significant proportion of these increases get passed on to the employee. As of January 2005, the average premium in the Denver Metro Area was:

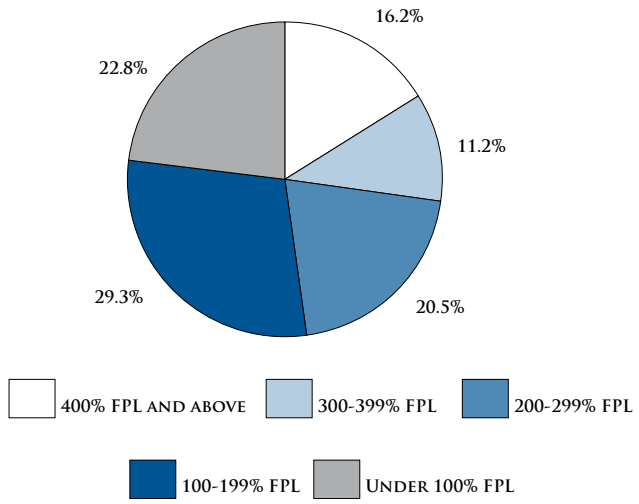
- Standard PPO plan, employee-only – $4,740 (age 36)
  - Employer (86%) $4,076
  - Employee (14%) $664
- Standard PPO plan for an employee and family of three – $14,208 (employee age 34)
  - Employer (60%): $8,525
  - Employee (40%) $5,683

Figure 10: Population distribution by insurance status, Colorado 2003-04 and U.S., 2004



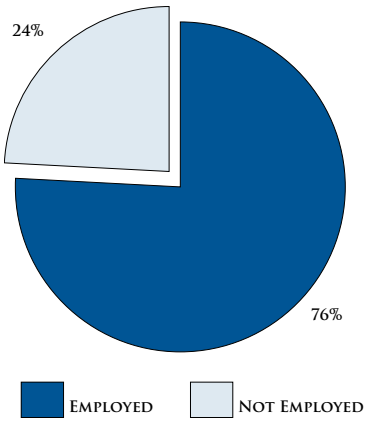
Source: Current Population Survey, 2003 and 2004 combined data.

Figure 11: Colorado uninsured (2002-04) by federal poverty levels (FPL)



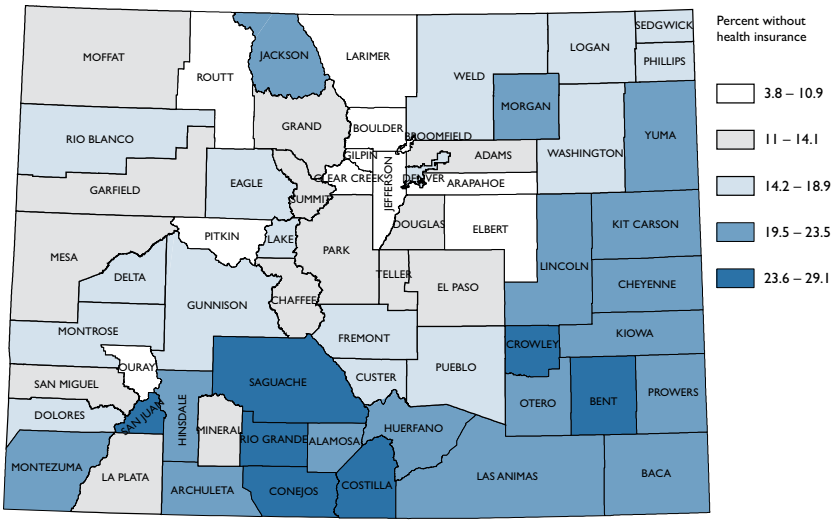
Source: Current Population Survey, 2002-04 combined data.

Figure 12: Uninsured working-age adults, Colorado, 2001-03



Source: Current Population Survey, 2002-03 combined data.

Map 8: Colorado uninsured by county, 2000



U.S. Percent = 14.2

People are considered uninsured if they are not covered by any type of health insurance for the entire year.

Source: Experimental estimates from the U.S. Census Bureau, Small Area Health Insurance Estimates (SAHIE) Program.

Long-term care

Long-term care covers an array of services provided over a sustained period of time to people with chronic health conditions and functional limitations. The need for long-term care is a function of age, self-care limitations and living alone. In addition, low income is a predictor of the need for publicly subsidized long-term care services. As Colorado's population continues to age, the state will face increasing demands for long-term care for the elderly.

Additionally, the prevalence of disability is unevenly distributed around the state, thus making the demand for long-term care services sensitive to the geographic distribution of the population.

Colorado had about 15,000 residents in nursing homes in 2003 (Table 2). According to the Kaiser Family Foundation this represents 3.4 percent of the 65+ population in Colorado.

Medicaid is the primary payer of institutional and community-based long-term care services in the state. Although Colorado is one of eight states that serves more long-term care clients in community settings than nursing homes, the Colorado Medicaid program still pays more for nursing home care than services provided in the community.

Table 2: Summary of number of distinct clients, full-time enrollee equivalents, and costs in nursing facilities (NF) versus the community-based elderly, blind, disabled (EBD) waiver. FY 1999-00 through FY 2003-04.

		Number of distinct clients	Number of full-time enrollee equivalents	Total Costs*	Costs per distinct client*	Cost per full-time enrollee equivalents*
FY '99-'00	EBD	13,006	9,435	$65,204	$5	$7
	NF	15,793	10,530	$347,522	$22	$33
FY '00-'01	EBD	14,082	10,454	$72,256	$5	$7
	NF	15,592	10,332	$360,822	$23	$35
FY '01-'02	EBD	15,157	11,271	$86,793	$6	$8
	NF	15,070	9,991	$372,603	$25	$37
FY '02-'03	EBD	15,634	12,057	$93,169	$6	$8
	NF	14,867	9,801	$384,278	$26	$39
FY '03-'04**	EBD	15,435	11,665	$92,569	$6	$8
	NF	14,341	9,652	$417,867	$29	$43

*Costs in thousands of dollars
**Preliminary

"Full time enrollee equivalent" refers to one enrollee equivalent in the program for 365 days. For example, two distinct clients, one of whom was in the program for 300 days and the other of whom was in the program for 65 days, would be counted as one full-time enrollee equivalent.

Source: HCBS-EBD 372 reports.

What the Experts Say…

Primary Care Health Professions Workforce

CHI's synthesis of key informant interviews, review of the literature and analysis of demographic trends suggests that attempting to define demand for primary health care simply in terms of physician-to-population ratios is artificially limiting. Instead, CHI suggests that strategic workforce planning should include particular attention to demographic trends, and how they may influence supply side (education and training) factors in workforce policy development. Based on expert interviews with health professions educators, the following considerations were noted:

- Primary health care professionals should receive specific training in disease management for prevalent chronic diseases such as diabetes and asthma. As the population ages, diabetes care and that of other chronic diseases will grow in significance and require primary care providers who have the skill and expertise to manage these diseases with the best evidence-based interventions available.
- To better serve the un- and underinsured, primary health care professionals need to be cognizant of the costs and benefits of treatment options, including the costs and efficacy of pharmaceuticals, both generics and their equivalents. For example, physicians need to be aware of whether their patients have the resources to actually purchase drugs that are prescribed, and, if not, what alternatives are available and efficacious.
- More Spanish-speaking primary care providers are needed who have specific cultural competencies to treat Latino patients.
- Because of the dearth of geriatricians in most areas of the state, family practice residency programs should include training in the care and treatment of an aging population with particular attention to the ongoing management of chronic conditions.

- Primary care professionals would benefit from focused curriculum content on health care delivery systems, particularly integrated care in rural areas that maximizes the interdisciplinary health care team approach involving the full range of physical, mental and dental health care providers.
- The training of primary care professionals should include mandatory rural rotations that expose residents and other trainees to rural lifestyle factors, including environmental and occupational issues such as pesticide use and health risks associated with farm machinery and equipment.
- Lack of mental health services in traditionally underserved areas suggests that primary care physicians should receive primary mental health care management as part of their residency training.

Medical and Clinical Laboratory Technologists

Another area of health workforce shortage in the state is in medical and clinical technologists. In the Colorado Occupational Employment Outlook, the Colorado Department of Labor and Employment estimates that between 2002 and 2012 the state will need to increase its number of medical and clinical laboratory technologists by 35 percent, in addition to filling turnover positions from retirement.[5] Colorado's three training programs, however, generate only a total of 32 graduates per year, about 25 percent of the projected need.[6]

CHI's research and interviews suggests that medical technology programs consider incorporating curriculum and training opportunities to address several emerging trends:

- As medical laboratory technology moves toward more highly sophisticated techniques and equipment, technologists need to enhance their skills to include the operation of this new equipment (i.e., robotic and automated equipment).
- As the aging of the population continues, technologists need to have the skills and competencies to communicate test results effectively to older patients.
- The medical laboratory technician as "educator" is an emerging patient education role for the profession. The number of laboratory tests and procedures is increasing at a significant rate, tests are more complex, and their results are more difficult to interpret and communicate. Medical laboratory technicians could be in a new role as liaison between the physician and the patient, one that requires teaching and educator functions that explain the complexity of laboratory results in a consumer-friendly format.
- As the Human Genome Project more fully emerges on the scene of mainstream medicine, there will be an even greater emphasis on the nuances of molecular biology, and it will be essential for medical and clinical laboratory technologists to be fully trained in this important translational work.

The Health Resources and Services Administration reports that Colorado's per-capita employment rate for medical and clinical laboratory technologists and lab technicians in 2000 was 74.2 per 100,000, compared with the U.S. rate of 103 per 100,000 population, making Colorado 46th in the country.[7] A number of reasons were given for the decline in the number of individuals pursuing careers in these fields:

- **Low wages** – In 2002, the median national wage for medical and clinical laboratory technologists was $42,910 annually.[8] Individuals with biological science backgrounds can earn significantly more in other health professions fields.
- **More professional opportunities for women** – The medical and clinical laboratory workforce traditionally has been female, but as more women with science backgrounds pursue higher-paying careers in medicine, fewer applicants are applying for laboratory technologist and technician programs.
- **Long and inconvenient work hours** – Hospitals employ technologists 24 hours per day, seven days per week. Most individuals don't want to work long hours, be on call, or work evenings and holidays.
- **Lack of marketing** – Many biological science graduates are not familiar with opportunities in clinical laboratory science.

Research associated with this study identified a number of options for increasing the supply of medical and clinical laboratory technologists in Colorado. These options include:

- The medical and clinical laboratory technology associations could generate more excitement about these careers among high school and college students.
- More outreach could occur in rural areas; in particular, consideration of a rural medical technology program should be a high priority.
- Medical and clinical laboratory programs can and should establish stronger collaborative ties with four-year colleges and universities.
- Universities and hospitals should consider prioritizing medical and clinical laboratory programs within their institutions.
- Grants should be made available to expand scholarship and loan repayment opportunities for medical and clinical laboratory students.

What Coloradans say…

In spring 2005, the Colorado Health Institute mailed a written survey to 640 community leaders in 23 communities around the state. The purpose of the survey was to assess the relative health threats to communities around the state and identify community-specific interventions being pursued.

As a group, respondents reported their top five health threats to be:

- Lack of affordable health insurance
- Low-paying jobs with no benefits
- Illicit drug use
- Alcohol abuse
- Lack of access to mental health services.

Rural-urban differences

Respondents living in rural communities consistently ranked the following five factors as the top health threats to their communities:

- Lack of affordable health insurance (92%)
- Illicit drug use (80%)
- Alcohol abuse (79%)
- Low-paying jobs with no benefits (78%)
- Lack of affordable housing (60%).

Urban respondents had an equally strong and consistent message about health threats that compromise the health of their communities:

- Lack of affordable health insurance (88%)
- Low-paying jobs with no benefits (73%)
- Alcohol abuse (64%)
- Illicit drug use (63%)
- Lack of doctors to see people with no health insurance (63%).

As Table 3 illustrates, there are significant differences between rural and urban communities in their descriptions of health threats. Substance abuse (alcohol and illicit drugs) appears to be a much more visibly felt health threat in rural communities across the state, possibly calling for interventions tailored to the unique geographic and cultural influences and challenges that define rural communities.

Respondents also had the option to write in and rate up to three additional health threats of their choosing. The most prevalent type of write-in response described a factor in the social or physical environment perceived to have a deleterious effect on the health of the community (49 responses). The two most common responses in this category were lack of transportation and environmental pollutants.

Other common write-in responses included issues related to the health care workforce (e.g., shortage of specialists), education, access to health care and illicit drug use, particularly methamphetamine usage.

Survey findings

Table 3: Health threats to communities (high threat = a response of 4 or 5 on a 5-point scale)

Health Threat	Total Respondents	High Threat TOTAL Respondents	Overall Rank	High Threat RURAL Respondents	Rural Rank	High Threat: URBAN Respondents	Urban Rank	Significant difference between urban/rural
Lack of affordable health insurance	372	90% (n = 336)	1	92% (n = 185)	1	88% (n = 151)	1	
Low paying jobs with no benefits	377	76% (n = 285)	2	78% (n = 159)	4	73% (n = 126)	2	
Illicit drug use	377	72% (n = 273)	3	80% (n = 164)	2	63% (n = 109)	4	++
Alcohol abuse	377	72% (n = 273)	4	79% (n = 162)	3	64% (n = 111)	3	++
Lack of access to mental health services	373	59% (n = 221)	5	58% (n = 116)	6	61% (n = 105)	6	
Lack of doctors who see people with no health insurance	369	59% (n = 216)	6	55% (n = 109)	7	63% (n = 107)	5	
Lack of affordable housing	373	57% (n = 213)	7	60% (n = 119)	5	54% (n = 94)	8	
Lack of access to health care services	372	53% (n = 199)	8	49% (n = 99)	8	58% (n = 100)	7	
Family violence	373	47% (n = 174)	9	48% (n = 97)	9	45% (n = 77)	14	
Lack of access to dentists	374	45% (n = 169)	10	40% (n = 80)	13	52% (n = 89)	9	+
Child abuse and neglect	372	45% (n = 168)	11	47% (n = 94)	10	43% (n = 74)	15	
Childhood poverty	376	43% (n = 162)	12	40% (n = 82)	12	46% (n = 80)	13	
Poor nutrition at home & in school	373	42% (n = 155)	13	33% (n = 67)	18	51% (n = 88)	10	++
Lack of leadership in addressing local health problems	375	42% (n = 159)	14	39% (n = 78)	14	47% (n = 81)	11	
Lack of access to family physicians	375	41% (n = 152)	15	35% (n = 71)	16	47% (n = 81)	12	+
Lack of after-school recreational activities for children and youth	374	40% (n = 148)	16	43% (n = 87)	11	35% (n = 61)	18	
Lack of community care for frail elders	368	36% (n = 134)	17	35% (n = 71)	15	38% (n = 63)	16	
High school drop-out rates	373	36% (n = 134)	18	35% (n = 70)	17	37% (n = 64)	17	
Lack of accurate information about community resources	373	29% (n = 107)	19	30% (n = 61)	19	27% (n = 46)	20	
Lack of prenatal care for pregnant women	372	26% (n = 95)	20	24% (n = 48)	20	28% (n = 47)	19	
Neighborhood crime	371	14% (n = 53)	21	11% (n = 22)	21	18% (n = 31)	21	+

Source: HealthONE Alliance Community Survey, 2005

+ = indicates statistical significance at p<.05 level. There is a 95% likelihood that the difference between urban and rural is not due to chance.

++ = indicates statistical significance at p<.01 level. There is 99% likelihood that the difference between urban and rural is not due to chance.

Endnotes

[1.] A "linguistically isolated" household is one in which all members age 14 years and over speak a non-English language and report that they speak English less than "very well."

[2.] Colorado Health Information Dataset. Available at http://www.cdphe.state.co.us/cohid/deathgeo.html (accessed April 25, 2005).

[3.] These factors were related to CHI staff in the course of key informant interviews.

[4.] American Academy of Family Physicians. "General Information about Family Practice Residency Programs." Reprint no. 150. Kansas City: The Academy; 1999. (As noted in Colwill, Jack, and James Cultice. "Increasing Numbers of Family Physicians – Implications for Rural America," as printed in the Council on Graduate Medical Education's Update on the Physician Workforce, August 2000.) http://www.cogme.gov/00_8726.pdf

[5.] Colorado Department of Labor and Employment, *Colorado Occupational Employment Outlook*. Available at http://www.coworkforce.com/lmi/oeo/oeo.asp.

[6.] CHI key informant interview with national accrediting agency for clinical laboratory science, May 18, 2005.

[7.] U.S. Health Resources and Services Administration. *HRSA State Workforce Profiles: Colorado, 2002*.

[8.] U.S. Department of Labor, Bureau of Labor Statistics, Occupational Outlook Handbook. Available at http://www.bls.gov/oco/home.htm (accessed May 5, 2005).

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