rural policy research institute

RUPRI Center for Rural Health Policy Analysis

Status and Future of Health Care Delivery in Rural Wyoming

June 2007

The mission of the RUPRI Center is to provide timely analysis to federal and state health policy makers, based on the best available research. The research of the RUPRI Center focuses on rural health care financing/system reform, rural systems building, and meeting the health care needs of special rural populations. Specific objectives include conducting original research and independent policy analysis that provides policy makers and others with a more complete understanding of the implications of health policy initiatives, and disseminating policy analysis that assures policy makers will consider the needs of rural health care delivery systems in the design and implementation of health policy.

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Executive Summary

The RUPRI Center for Rural Health Policy Analysis at the University of Nebraska Medical Center conducted this analysis of the delivery of health care services in rural Wyoming under contract to the Wyoming Healthcare Commission. We collected data between July 2006 and March 2007 from a variety of sources.

Key Findings

- The demographic shift of the aging population will increase an already growing demand for health care professionals. Recruitment and retention should be priorities at all levels, from local to state, including public and private entities.
- In order to decrease the number of health care professionals who leave Wyoming, the state should support and encourage increased participation in programs with proven success.
- Stakeholders in Wyoming health care delivery recommended a step-wise strategy of integrating services in local communities and then building regional systems.
- Stakeholders believe there is no pattern of sustained leadership in health care in Wyoming, but there are potential sources of leadership that can be explored.
- Community members expressed concern about continuous population growth combined with the number of providers reaching retirement, and stressed the importance of recruitment and retention efforts.
- Respondents identified services for the elderly as a current or future need, particularly assisted living.
- Considering the combined effect of the direct and indirect impact on Wyoming's economy, health care accounts for 10.3% of the state's total employment, 10.5% of the state's total income, and 8.2% of the state's total output.
- The estimated total lost revenue for Wyoming hospitals due to inpatient out-migration to Colorado, Utah, and Nebraska was $101.3 million in 2003. As a result, an estimated $32.5 million less was spent in other economic sectors of Wyoming communities in the same year.
- Other states have formal or informal networks of providers to coordinate care. Examples of strong comprehensive networks across providers are the Alaska Federal Health Care Access Network and the Nebraska Rural Comprehensive Care Network.
- State health agencies use advisory groups to provide technical assistance and formulate recommendations. The Health Policy Commission in New Mexico, for example, is an independent commission monitoring the health status and health care services in the state.

Recommendations

Recommendation to Meet the Need for Health Professionals

1. Establish a coordinated, multifaceted approach to health care provider recruitment and retention.

Recommendations to Improve Health Care in Communities

2. Assess access to core health care services (public health, EMS, primary care), and then engage the Wyoming Health Planning Commission (see Recommendation 9) to design cost-effective strategies to deliver core services to all Wyoming residents.

3. Develop a coalition of state leaders, health care insurers, and major Wyoming employers to implement joint strategies that improve population health and worker productivity.

4. Charge a work group to assess community health, facilitate public health and local provider integration, implement community health improvement strategies, and remeasure to assess intervention effectiveness.

5. Target Wyoming's "vulnerable" communities for detailed community assessment and needs analysis to protect people in greatest need and improve community vitality. Then, request that the Wyoming legislature direct appropriate resources to those communities.

Recommendations to Monitor and Analyze Trends In Health Care Delivery

6. Implement a plan to assess health information and communication needs and then prioritize resources for health information and communication needs. Provide funding to develop Wyoming's health information infrastructure.

7. Convene a health care provider group under the direction of the Wyoming Health Planning Commission (see Recommendation 9) to assess patient migration patterns (both within state and out of state) and then implement a plan to improve access to Wyoming health care providers.

8. Design a process to analyze boom and bust economic impacts and then design strategies to mitigate the negative effects of bust economies and extend the positive effects of boom economies.

9. Establish and fund a Wyoming Health Planning Commission.

Recommendations to Achieve Systemic Change in Health Care Delivery and Finance

10. Charge a work group to begin comparative analyses of treatment protocols and medication use.

11. Establish projects to test potential improvements to the health care system designed to increase health care value (improved quality, improved service, and/or decreased cost).

12. Continue and expand Wyoming Office of Rural Health efforts in the Medicare Rural Hospital Flexibility grant program to develop critical access hospital networks and foster collaborative linkages between Wyoming's primary, secondary, and tertiary hospitals.

13. Consider health care service development as one facet of a multisector approach to economic development.

Recommendations for Specific Actions

14. Specifically address rural mental health and substance abuse issues. Monitor the effectiveness of current system investments.

15. Specifically address the health care (physical and mental) and housing (independent living, assisted living, nursing home, etc.) needs of the Wyoming elderly.

16. Continue development of a statewide emergency medical services and patient transportation plan.

17. Within demonstration project(s), investigate development, implementation, and outcome evaluation of a healthcare funding strategy that places at least partial resource allocation authority within a representative community foundation (e.g., a Health Outcomes Trust or Primary Care Trust).

Part One: Overview of Wyoming's Health Care Delivery System

Introduction: Conceptual Framework

The Rural Policy Research Institute (RUPRI) Center for Rural Health Policy Analysis produced this report under contract to the Wyoming Healthcare Commission (WHCC). The report describes the current condition of the rural health care delivery system in Wyoming and recommends changes to build a health care delivery system that best meets the needs of residents of the state. We use a patient-centered, community-based paradigm to guide this study for two reasons. First, the delivery system should maximize the likelihood of desired outcomes for each individual. The Institute of Medicine (IOM) identified a patient-centered focus as one of six aims for a twenty-first century health care system, with the others being that care is timely, safe, efficient, effective, and equitable.[1] The IOM Committee on the Future of Rural Health Care incorporated an additional population-based aim, that health care delivery systems be designed to sustain optimum health of communities.[2] Second, we used a community-based paradigm, or what we term a place-based health policy, to focus on the community in much the same way as the IOM did, by describing the current health care delivery system in rural Wyoming and what would be needed to move systems of care (for each community) to a level that optimizes both population and individual health.

In addition to a patient-centered, community-based paradigm, we use a continuum of care framework to guide this study.[3] The continuum describes the breadth of health care services in seven stages: personal behavior, emergency and primary care, routine specialty care, inpatient care, rehabilitative services, long-term care, and palliative care. The continuum helps to clarify the services to which every rural resident should have access, whether provided locally or at a distance. Local primary care providers should know about the care received by their patients regardless of location, a goal that is best achieved when systems of care are integrated, at least for individuals and at best for populations.

The combination of taking a patient-centered approach to analyzing the health care delivery system and placing importance on community health requires consideration of more than the component parts of medical care. Services that enhance individual potential and characteristics of a healthy community are important ingredients to a design that achieves the goals of a healthy population. For example, transportation services are important to individuals, and social and institutional capital are important to communities, as *enabling resources.* A strategy to improve health care is best implemented locally, where there is the greatest awareness of resources and how to use them effectively. Integration with services in the region will be part of that local strategy, as will a means of incorporating services from more distant locations (e.g., complex diagnoses, transplants requiring experienced, highly specialized teams). The success of the strategy will be evaluated locally, using measures of population health.[4]

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[1] Committee on Quality of Health Care in America, Institute of Medicine. (2001). *Crossing the quality chasm: A new health system for the 21st century.* Washington, DC: National Academies Press.

[2] Committee on the Future of Rural Health Care, Institute of Medicine. (2005). *Quality through collaboration: The future of rural health care.* Washington, DC: National Academies Press.

[3] Mueller KJ & MacKinney AC. (2006). Care across the continuum: Access to health care services in rural America. *Journal of Rural Health, 22*(1), 43-49

[4] Size T, MacKinney AC, & Kindig D. (2006). Population health improvement and rural hospital balanced scorecards. *Journal of Rural Health, 22*(2), 93-96.

Introduction: Conceptual Framework

In recent years, researchers, activists, and policy makers who examine and advise on the programs and policies that direct rural health care access and quality in America have been moved to reexamine and reinvent the definition of rural place and how rural areas are serviced by government policy.[5] Former Health and Human Services Secretary Tommy Thompson joined with this movement in his address to the Summit on Rural America on July 26, 2002, stating:

> After talking with people all across America, I realized we had to have a special focus on rural towns and communities. We had to change the way we thought about rural communities. We could no longer just think of them as 'small cities.' Rural communities have unique challenges that bring with them unique opportunities.[6(p. 1)]

Soon after the summit, rural scholars and activists refined this call to place-based policy and research by issuing the Nebraska City Declaration. This treatise states:

> Few of the problems that face rural communities respect jurisdictional boundaries. Few rural communities have sufficient resources and population to attract competitively priced infrastructure, facilities, and services. Therefore, individual communities must join with others in creating regional approaches to development. Likewise, it only makes sense for governments to allow and encourage such regional cooperation.[7(pp. 2-3)]

A place-based definition of rural incorporates the local culture, relying on residents and service providers to define the boundaries of what they believe to be their community (there may be some variation, in that service areas can be larger than the community with which the provider identifies personally). For this study, community becomes a place that encompasses more than just a town, village, or suburb; it includes the tangible service area around the legally recognized boundaries of the town (census designated place).

Health policy offers a framework for considering community health, which requires appropriate policies in all sectors that affect the health and well-being of residents in the community. Examples of the extent to which policies in one sector affect outcomes in other sectors include the following:

- Economic status of households and therefore economic development of communities is related to the ability to purchase health care services.
- Income, specifically poverty, is independently related to poor health status.
- Housing availability and quality influences health, particularly of children.

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[5] Woods, M. (2003). Deconstructing rural protest: The emergence of a new social movement. *Journal of Rural Studies, 19*(3), 309-325.

[6] Thompson, T. G. (2002). Expanding HHS' Efforts Throughout Rural America. Speech before the Summit On Rural America. Denver, Colorado. July 26, 2002. Available on-line at: http://www.hhs.gov/news/speech/2002/020726.html.

[7] Rural Policy Research Institute. (2002). 2002 Rural Matters Symposium. The Nebraska City Declaration. October 18, 2002. Available on-line at: http://www.rupri.org/ruralmatters/index.html

- Transportation influences access to services.

The RUPRI Center gathered information necessary to assess delivery of services in rural Wyoming, using the IOM aims as criteria for success and the continuum of care as a means of categorizing services. The following chapters present our assessment of the health care delivery system in rural Wyoming:

Chapter 1: Wyoming population and the health care delivery system, including information on age, race, ethnicity, distribution of health care providers, and health care shortage areas

Chapter 2: Workforce recruitment and retention, including findings from interviews with academic officers at the University of Wyoming

Chapter 3: Delivery system redesign, including challenges to system change, a strategy for service integration, and the status of leadership in Wyoming

Chapter 4: Community case studies, including results from our site visits to two rural communities

Chapter 5: Economic impact of the health care system, including the impact of the health care sector on jobs, income, and overall spending at the state and county level

Chapter 6: Hospital inpatient out-migration, including the financial impact of out-migration as estimated in total lost charges and revenues for Wyoming hospitals and estimated less spending for Wyoming communities

Chapter 7: Other systems as models for change, including information on where Wyoming ranks in comparison to six other states and descriptions of programs or organizations successfully operating in these states

Throughout this study, the project management team has met with the WHCC to agree on a final protocol for the project. Modifications were made as appropriate to ensure that the project would meet the needs of the WHCC. The RUPRI Center collaborated with the WHCC and other stakeholders through discussions and critiques of interim products. By following this protocol it is our firm belief that the final product has sufficient validity in a Wyoming context to lead to action, action which requires acceptance by important stakeholders.

Chapter 1. Wyoming Population and the Health Care Delivery System

Key Findings

- Population trends reveal that the number of Wyoming residents of working age (between 15 and 54 years of age) steadily increased between 1990 and 2000 by approximately 12.3%, but is projected to decrease by 8.6% from 2000 to 2020, with county level populations projected to decline between 4.5% and 35.3% during the same period.
- In 2005, almost 40% of Wyoming's total population was elderly (65 years of age and older) and children (19 years of age and younger).
- Since 1980, Wyoming has experienced a dramatic increase in its racial minority and Hispanic ethnicity (any race) populations. The most notable increases were in Teton County between 1990 and 2000 where the number of racial minorities of non-Hispanic ethnicity increased from 150 persons to 398 persons and the number of racial minorities of Hispanic ethnicity increased from 33 persons to 772 persons.
- Teton County also saw an increase in the number of persons of white Hispanic ethnicity, from 125 persons to 413 persons between 1990 and 2000, and the number of persons is estimated to have increased to 1,906 in 2005.
- Between 1980 and 1990, Wyoming experienced a 44.6% increase in the number of individuals living below the federal poverty level, representing approximately 11.9% of the total population for which poverty status had been determined in 1990. Between 1990 and 2000, the trend continued but with less intensity.
- Four counties in the north central region and 4 counties on the eastern border of Wyoming have no local emergency medical services.
- Large areas of Wyoming are federally designated as health professional shortage areas for primary care, dental health, and/or mental health.

Analyzing the Characteristics of Wyoming's Population

Methods

We built our data collection and analysis of population on 1980, 1990, and 2000 census data, and population estimate and projection data based on U.S. Census Bureau estimates and projections further developed by the Wyoming Department of Administration and Information, Economic Analysis Division. We used U.S. Census Bureau data from a series of geographies from smallest available to largest (block-groups, census tracts, counties, and states). Data were compiled into tables (see Appendix A) and analyzed at the state and county level to show population, social, and economic characteristic trends over time. Data were also used to illustrate population density for selected geographies and population groups.

Findings

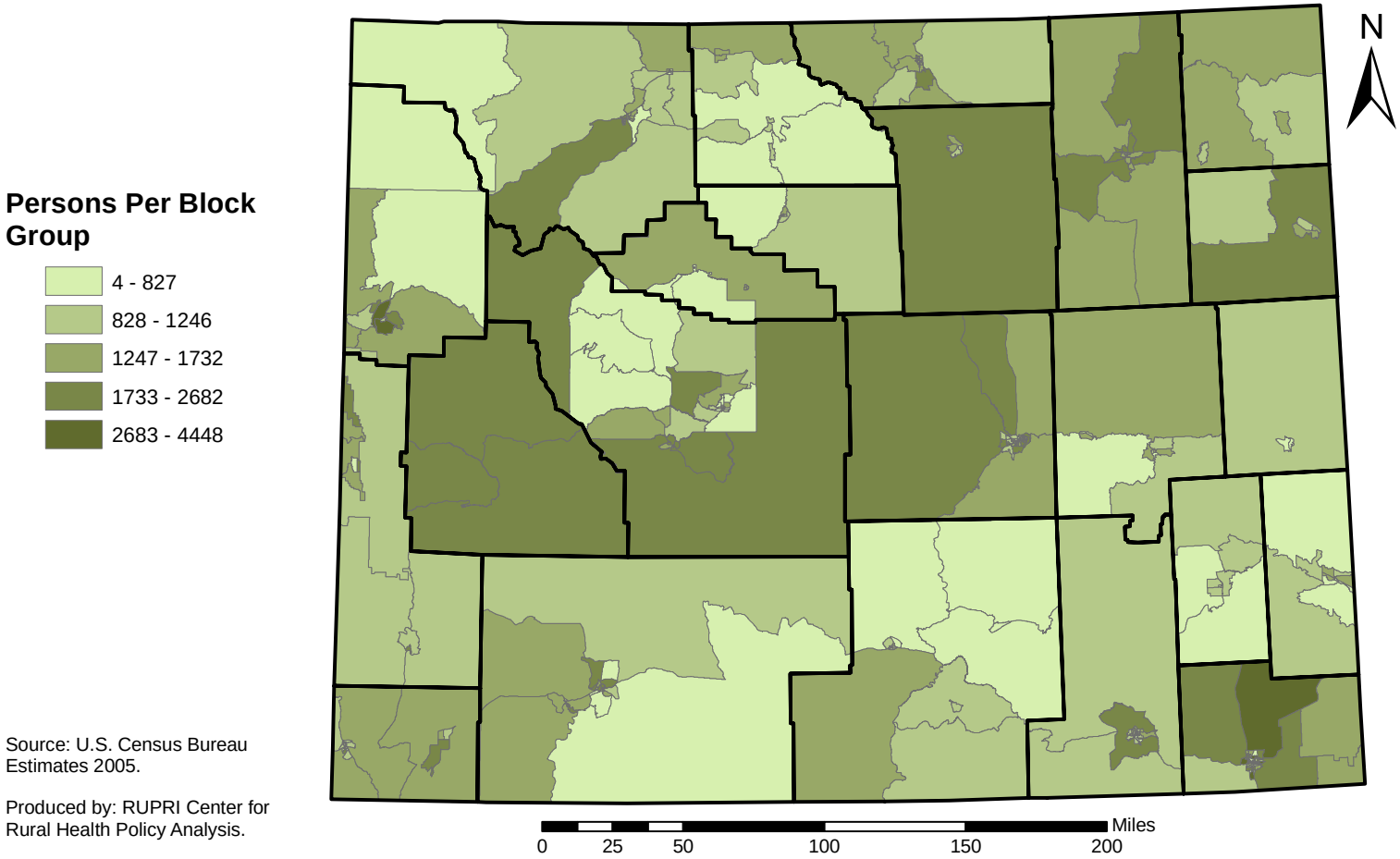
Population Characteristics

Population characteristic findings show total area populations (all ages) for Wyoming and selected counties. Three age categories were developed demonstrating population trends for the following groups: working age (15 to 54 years), elderly (65 years and older) and youth (19 years and younger). Map figures illustrate Wyoming's total population per block group (Figure 1.1) and the population density of elderly and youth populations by county (Figures 1.4 and 1.5) in 2005. Additional figures show population trends from 1980 to 2020 for all population age categories. Population data can be found in Appendix A, Tables A.1 – A.8.

Total Population

- Between 1980 and 1990, Wyoming experienced a decline in overall population of about 3.4% but the population began to climb again in 1990 with population projections estimating a total growth of approximately 13.6% by 2020 (Figure 1.2).
- Between 1980 and 2020, the population of Uinta County is projected to grow by 49.8%, from a total population of 13,021 people in 1980 to 19,509 people by 2020 (Figure 1.2).
- The total population of Campbell County is expected to grow from 24,367 in 1980 to 44,595 by 2020, representing a total population change of approximately 83.0% (Figure 1.2).
- Teton County has had the fastest growing total population in Wyoming since 1980 (9,355 total population), and is projected to almost triple by 2020 (26,671 total population), representing a total population growth of approximately 185.1% (Figure 1.2).
- Carbon County experienced an initial population decline between 1980 (21,896 total population) and 1990 (16,659 total population) of approximately 23.9%, with projections indicating further decline through 2020 of approximately 36.2% but at much lower rates than that experienced between 1980 and 1990 (Figure 1.2).
- Platte County faces a trend similar to Carbon County's, with an initial population decline of 32.0% between 1980 (11,975 total population) and 1990 (8,145 total population) and a projected decline of 26.8% overall between 1980 and 2020 (Figure 1.2).

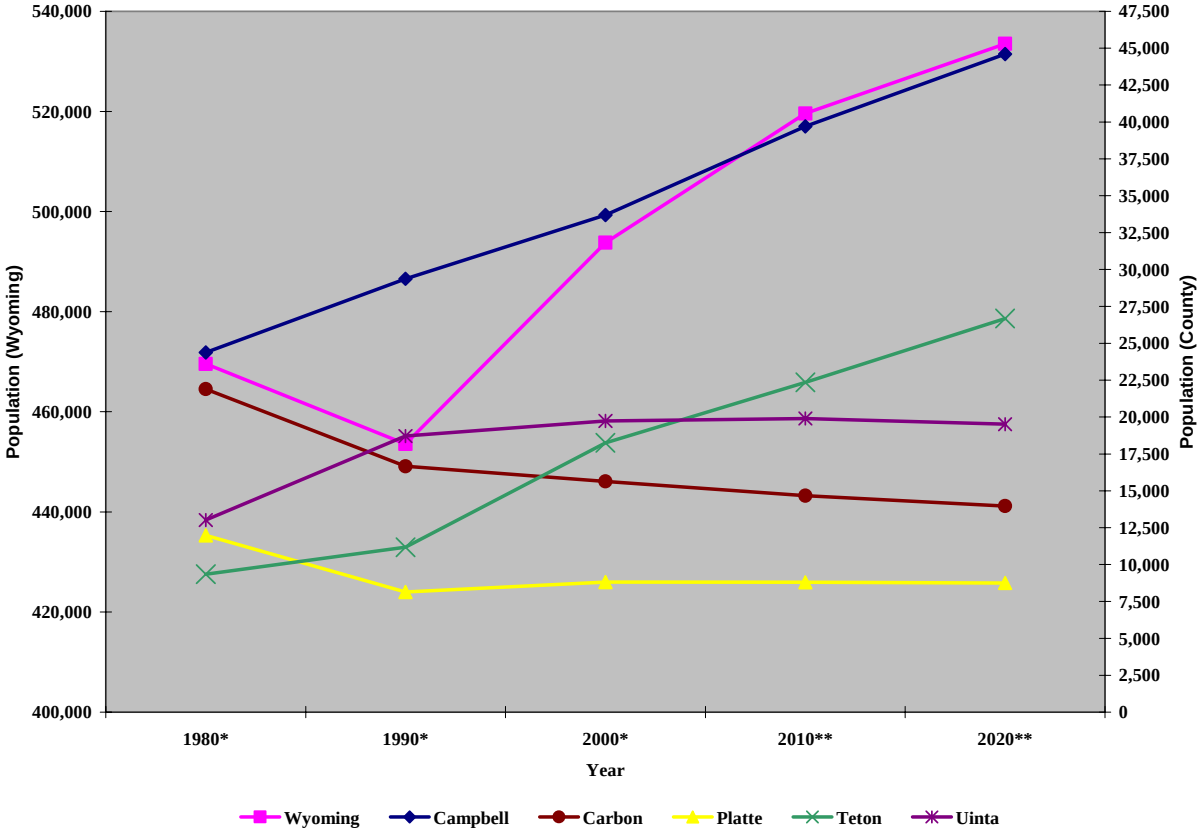
Figure 1.1. Wyoming Population Per Block Group, 2005



Source: U.S. Census Bureau Estimates 2005.

Produced by: RUPRI Center for Rural Health Policy Analysis.

Figure 1.2. Population Census and Projections by Selected Counties, Wyoming 1980 to 2020



Sources: U.S. Department of Commerce, Bureau of the Census (http://www.census.gov/). 1980, 1990, and 2000 Decennial Census Data; Population Estimates and Forecasts for Wyoming, counties, cities, and towns for 2000-2020, from Wyoming Department of Administration and Information, Economic Analysis Division http://eadiv.state.wy.us/demog_data/demographic.html.

*Calculations based on actual population data.
**Calculations based on projected population data.

Working Age (between 15 and 54 years[8]) Population

Figure 1.3 illustrates the decline and growth of the working population in Wyoming and select counties since 1980. Projections indicate that this population will significantly decline by 2020 across the board for both the state and counties with few exceptions (e.g. Campbell, Johnson, Sublette and Teton Counties shown in table A.3 in Appendix A).

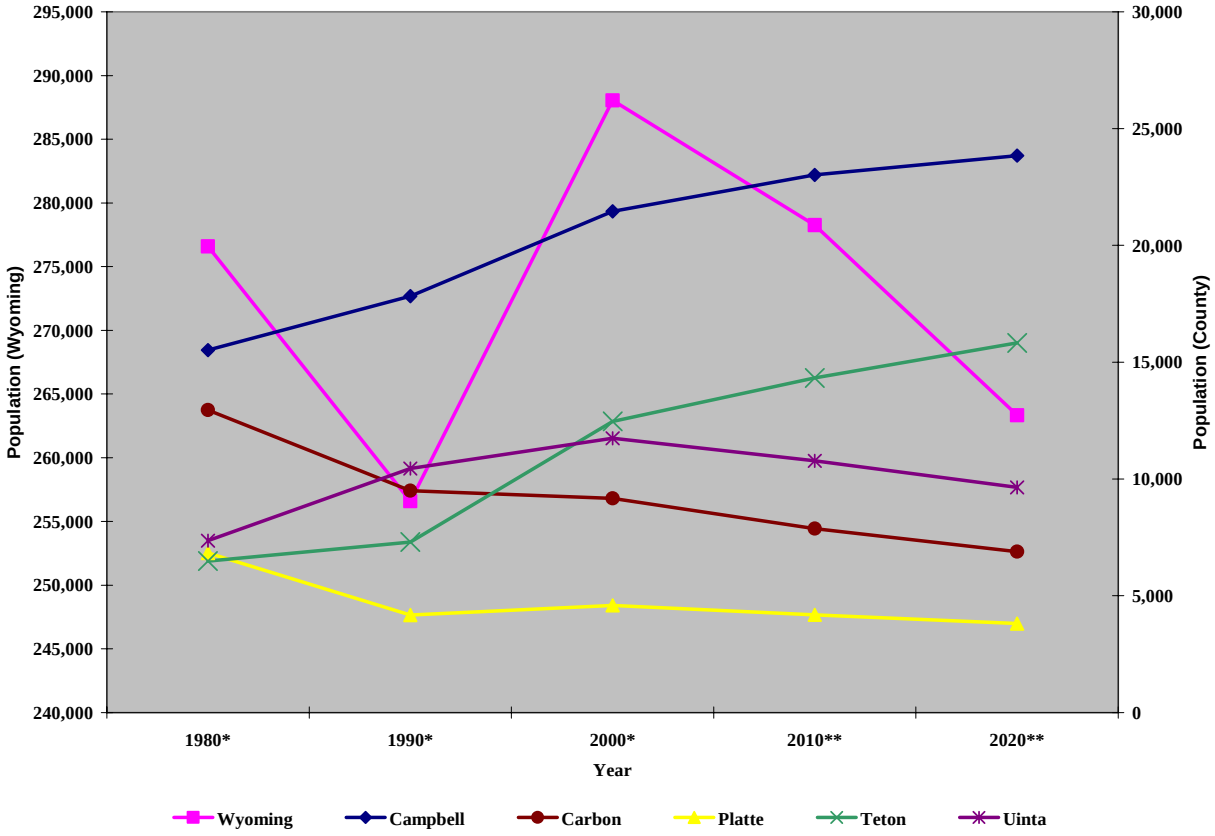
- For Wyoming residents of working age (between 15 and 54 years), the population grew by approximately 12.3% from 1990 (256,589 total working age population) to 2000 (288,056 total working age population), but is projected to decline by approximately 8.6% by 2020 (263,330 total working age population).
- At the county level, Carbon County also experienced dramatic decline in its working age population between 1980 (12,951 total working age population and 2000 (9,167 total working age population) of 29.2%. Carbon County's working population is projected to

[8] Due to data limitations, working age is defined as all persons between 15 and 54 years of age.

decline by an additional 24.8% by 2020 (6,890 total working age population), for an overall decline of approximately 46.8% from 1980 to 2020.

- Similar to Carbon County, Platte County's working age population declined between 1980 (6,837 total working age population) and 1990 (4,175 total working age population) by 38.9%, recovering by 9.8% by 2000 (4,586 total working age population). The working age population is expected to decline, however, by an additional 16.8% by 2020 (3,815 total working age population), for a total decline of 44.2% between 1980 and 2020.
- In contrast to Carbon and Platte Counties, Campbell County experienced a significant population growth between 1980 (15,513 total working age population) and 2000 (21,454 total working age population) of 38.3%. The growth is projected to continue at lower rates through 2020 (23,838 total working age population), for a total growth of 53.7% between 1980 and 2020.
- Uinta County also experienced substantial growth of the working age population between 1980 (7,361 total working age population) and 2000 (11,741 total working age population) of 59.5%, but this population is expected to decline by 17.9% by 2020 (9,638 total working age population).
- With the fastest growing total population in the state, Teton County's working age population also grew substantially. Between 1990 (7,305 total working age population) and 2000 (12,470 total working age population), the total working age population increased by 70.7%, and it is expected to grow by an additional 26.9% by 2020 (15,829 total working age population), for a total growth of 144.2% from 1980 to 2020.

Figure 1.3 Working Age (15-54 years) Population Census and Projections by Selected Counties, Wyoming 1980 to 2020



Sources: U.S. Department of Commerce, Bureau of the Census (http://www.census.gov/). 1980, 1990, and 2000 Decennial Census Data; Population Estimates and Forecasts for Wyoming, counties, cities, and towns for 2000-2020, taken from Wyoming Department of Administration and Information, Economic Analysis Division http://eadiv.state.wy.us/demog_data/demographic.html

*Calculations based on actual population data.
**Calculations based on projected population data.

Elderly and Youth Populations

- In 2005, almost 40% of Wyoming's total population was elderly (65 years of age and older) and children (19 years of age and younger) (Figures 1.4 and 1.5).
- Overall trends from 1980 to 2020 at the state and county levels indicate dramatic growth of the elderly population (aged 65 years and older) and decline of the youth population (aged 19 years and younger) (Figure 1.6).
- Projections for Wyoming residents 19 years of age and younger indicate an overall population decline from 1980 (163,845 total population 19 years and younger) to 2020 (144,156 total population 19 years and younger), representing a 12.0% total projected decline (Figure 1.6).
- Wyoming's elderly population (aged 65 years and older) experienced a 55.4% growth from 1980 (37,175 total elderly population) to 2000 (57,786 total elderly population), and

is projected to grow by an additional 67.8% by 2020 (96,962 total elderly population) for a total growth of 160.8% between 1980 and 2020 (Figure 1.6).

- At the county level, Campbell and Teton counties are similar to state level trends, with significant levels of growth in their elderly populations and projections indicating that the trend will continue at least through 2020.
- Between 1980 and 2000 Campbell County's elderly population increased from 693 residents aged 65 years and older to 1,789 residents aged 65 years and older, representing a 158.2% increase over 20 years. Population projections indicate that by 2020 Campbell County's elderly population will increase to 5,743 residents aged 65 years and older, signifying a growth of approximately 221.0% between 2000 and 2020.
- Similarly, Teton County's elderly population grew by an estimated 165.0% between 1980 (486 residents aged 65 years and older) and 2000 (1,288 residents aged 65 years and older). Projections show that by 2020 Teton County's elderly population will reach 2,785 residents aged 65 years and older, representing an increase of approximately 175.0% between 2000 and 2020.

Figure 1.4. Percent of Wyoming Population Aged 19 Years and Younger Per County, 2005

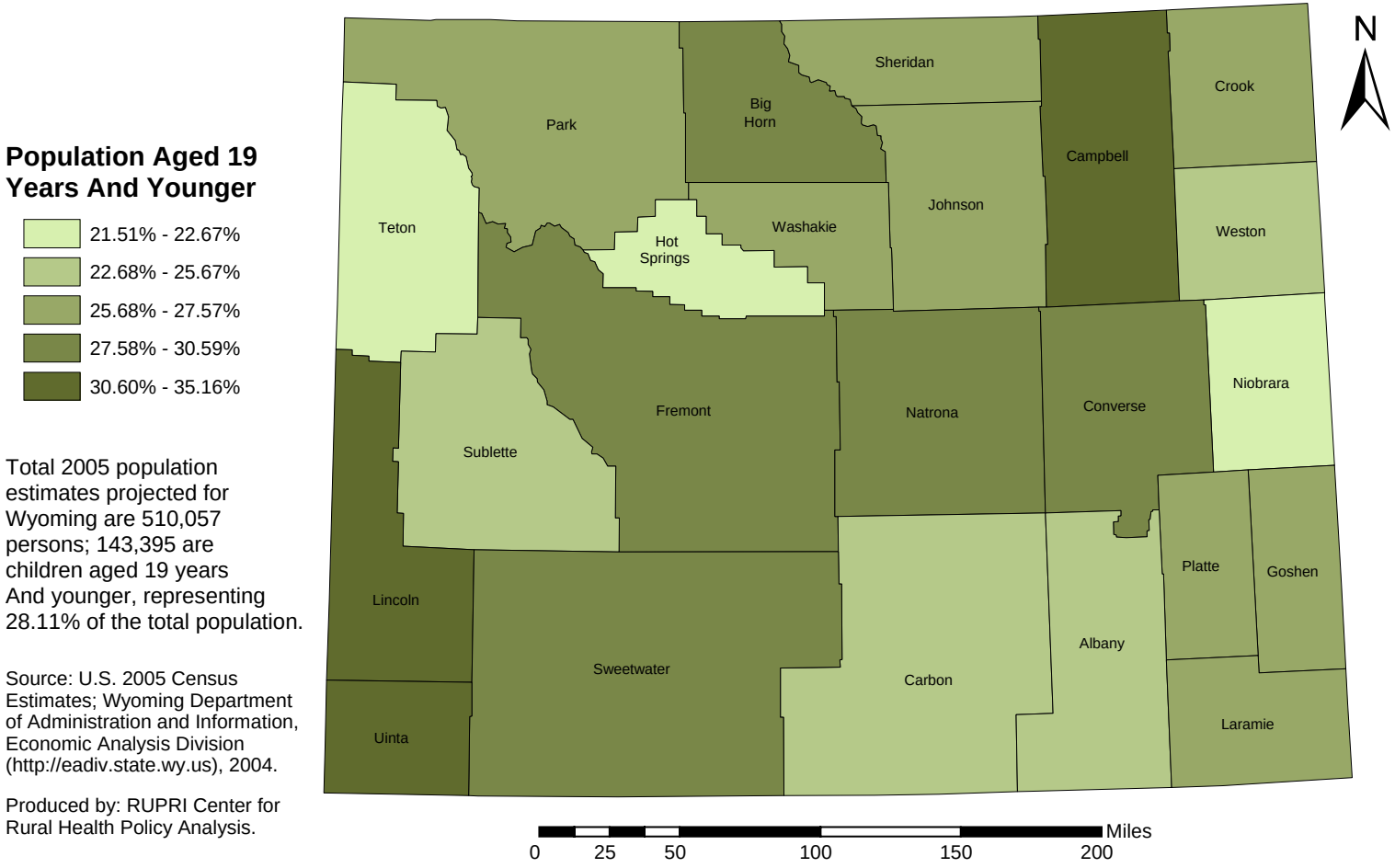


Figure 1.5. Percent of Wyoming Population Aged 65 Years and Older Per County, 2005

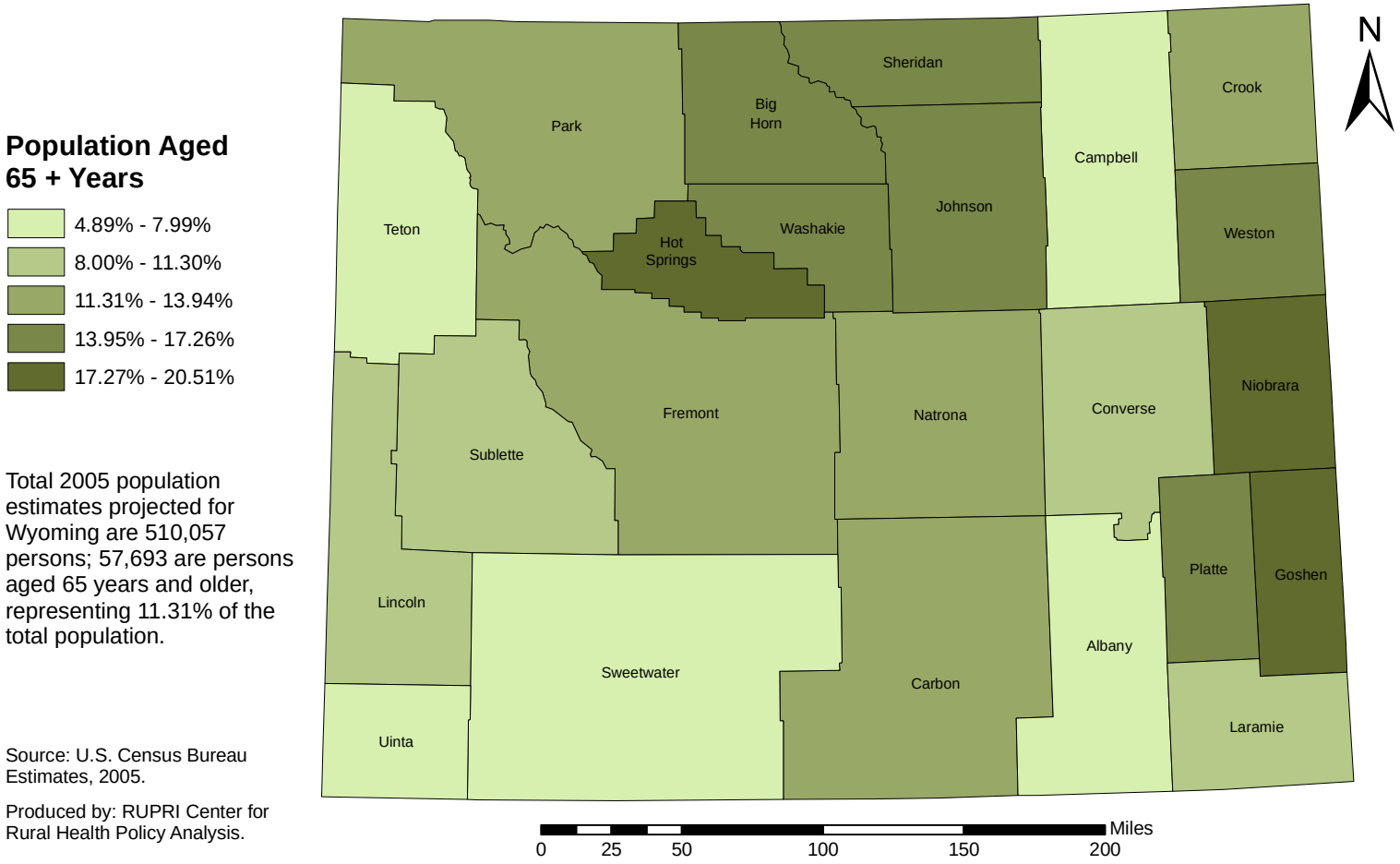
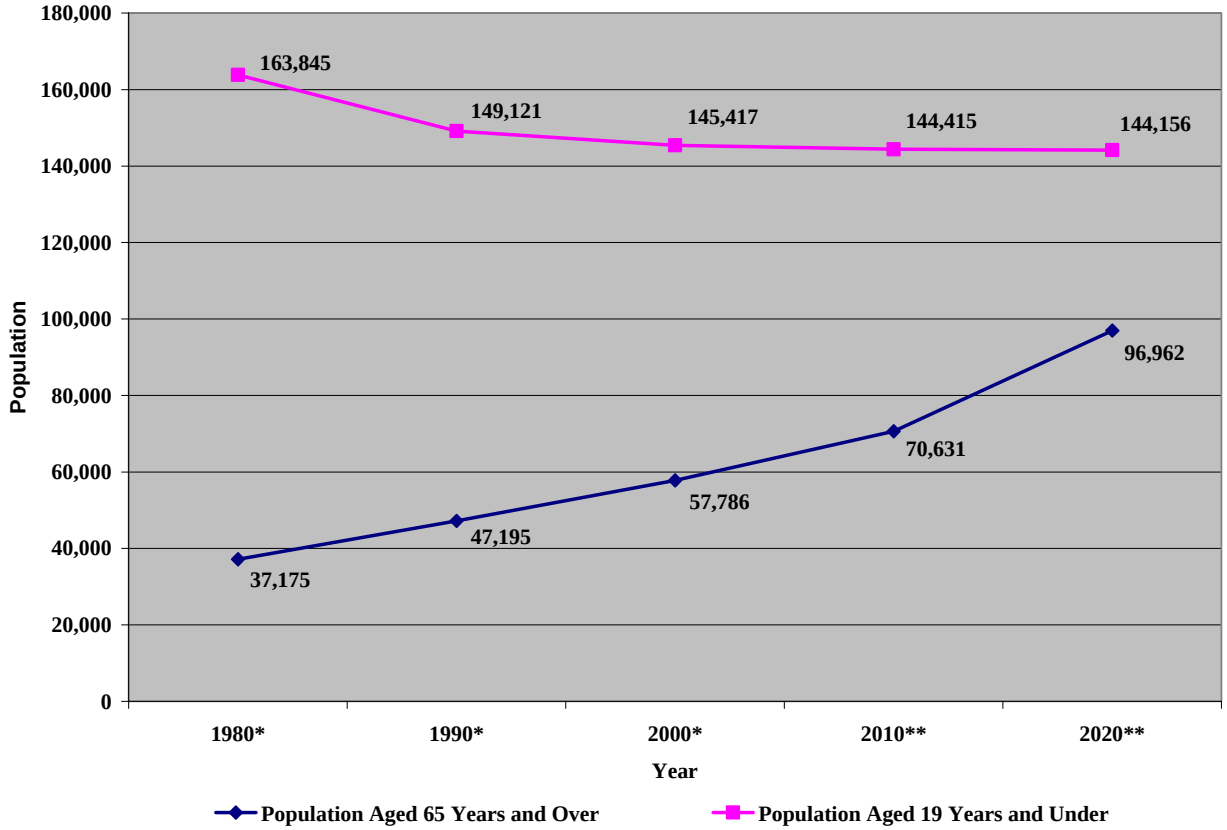


Figure 1.6. Elderly (aged 65 years and older) and Youth (aged 19 years and younger) Population Census and Projections by Selected Counties, Wyoming 1980 to 2020



Sources: U.S. Department of Commerce, Bureau of the Census (http://www.census.gov/). 1980, 1990, and 2000 Decennial Census Data; Population Estimates and Forecasts for Wyoming, counties, cities, and towns for 2000-2020, from Wyoming Department of Administration and Information, Economic Analysis Division http://eadiv.state.wy.us/demog_data/demographic.html.

*Calculations based on actual population data.
**Calculations based on projected population data.

Social Characteristics

Social characteristic data were placed into two different categories: educational attainment and racial minority and Hispanic ethnicity (all races) populations. The findings for these data are illustrated throughout the figures below and describe educational attainment trends from 1980 to 2000 and racial minority and Hispanic ethnicity (all races) population trends from 1980 to 2005 for Wyoming and selected counties. Additional map figures show the population density of racial minorities and Hispanic ethnicity (any race) populations per county in 2000. Social Characteristic data can be found in Appendix A, Tables A.9 – A.13.

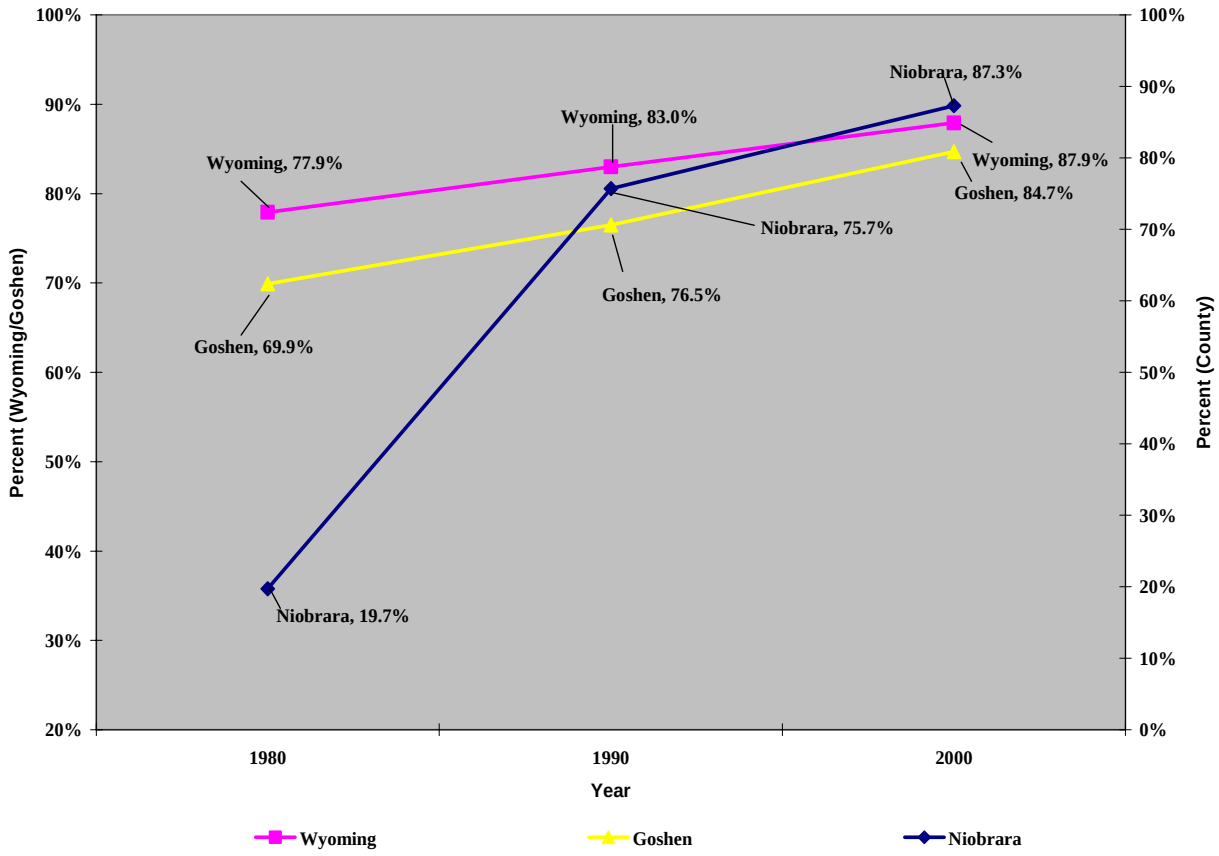
Educational Attainment

- Overall, the educational attainment of Wyoming residents 25 years and older has steadily increased since 1980 with just 77.9% holding a high school degree or higher (198,761 out

of 255,149 residents) at that time. By 2000, 87.9% (277,468 out of 315,663 residents) of residents 25 years and older held a high school degree or higher.

- While most counties saw growth in the educational attainment of residents 25 years and older, the most notable changes occurred within Niobrara County and Goshen County. In 1980, only 19.7% (363 out of 1,843 residents) of Niobrara residents aged 25 years and older had a high school degree or higher. By 2000, 87.3% (1,511 out of 1,731 residents) of the county's total population aged 25 years and older held high school degrees or higher (Figure 1.7).
- Although not as dramatic a shift as Niobrara County, the percent of the total population aged 25 years and older in Goshen County that held a high school degree or higher increased from 69.9% (4,999 out of 7,151 residents) in 1980 to 84.7% (1,511 out of 1.731 residents) by 2000 (Figure 1.7).

Figure 1.7. Education Attainment, Residents Aged 25 Years and Older, Population Census by Select Counties, Wyoming 1980 to 2000



Source: U.S. Department of Commerce, Bureau of the Census (http://www.census.gov/). *1980, 1990, and 2000 Decennial Census Data* taken from Wyoming Department of Administration and Information, Economic Analysis Division http://eadiv.state.wy.us/demog_data/demographic.html.

Racial Minority and Hispanic Ethnicity (any race) Populations

As other states have shown, Wyoming's racial minority and Hispanic ethnicity populations have grown dramatically since the last census. Beginning in 1980, the U.S. Census Bureau began to ask distinct questions about race and ethnic origins. Since then, there have been significant changes to these questions that affect comparability across years.[9]

- In 2000, racial minorities represented 6.1% of Wyoming's total population while persons of Hispanic ethnicity represented 6.4% of the total population (Figures 1.8 and 1.9).
- Racial minorities have been steadily growing since 1980 throughout Wyoming. Between 1980 and 2005 racial minorities of non-Hispanic ethnicity increased by approximately 77.7% (13,123 to 23,314 racial minorities of non-Hispanic ethnicity) and racial minorities of Hispanic ethnicity by 58.8% (9,946 to 15,798 racial minorities of Hispanic ethnicity) (Figure 1.10).
- Similarly, residents of Hispanic ethnicity increased across Wyoming by 39.9% from 1980 (24,499 total Hispanic population) to 2005 (34,264 total Hispanic ethnicity population) and are projected to reach 40,221 persons by 2009 (Figure 1.10).
- Wyoming's white Hispanic ethnicity population grew dramatically between 1980 and 2005 from 14,453 persons to 31,833 persons representing a total increase of approximately 118.7% (Figure 1.10).
- While similar trends have been occurring throughout Wyoming, the most significant increases have been identified in Teton County. Between 1990 and 2000 racial minorities of non-Hispanic ethnicity increased from 150 persons to 398 persons, and racial minorities of Hispanic ethnicity increased from 33 persons to 772 persons (Figure 1.10.
- Similarly, Teton County's racial minority Hispanic ethnicity population increased from 33 persons to 772 persons between 1990 and 2000, but is estimated to have decreased back to 56 persons in 2005. During the same period, the white Hispanic ethnicity

[9]"Comparability. There are two important changes to the Hispanic origin question for Census 2000. First, the sequence of the race and Hispanic origin questions for Census 2000 differs from that in 1990; in 1990, the race question preceded the Hispanic origin question. Testing prior to Census 2000 indicated that response to the Hispanic origin question could be improved by placing it before the race question without affecting the response to the race question. Second, there is an instruction preceding the Hispanic origin question indicating that respondents should answer both the Hispanic origin and the race questions. This instruction was added to give emphasis to the distinct concepts of the Hispanic origin and race questions, and to emphasize the need for both pieces of information.

Furthermore, there has been a change in the processing of the Hispanic origin and race responses. In the 1990 census, respondents provided Hispanic origin responses in the race question and race responses in the Hispanic origin question. In 1990, the Hispanic origin question and the race question had separate edits; therefore, although information may have been present on the questionnaire, it was not fully utilized due to the discrete nature of the edits. However, for Census 2000 there is a joint race and Hispanic origin edit which can utilize Hispanic origin and race information that was reported in the inappropriate question."

Source: U.S. Census Bureau, accessed on June 26, 2007.
http://factfinder.census.gov/servlet/MetadataBrowserServlet?type=subject&id=NQSPANSF1&dsspName=DEC_2000_SF1&back=update&_lang=en

population grew from 125 persons to 413 persons, increasing dramatically to approximately 1,906 persons in 2005 (Figure 1.10).

Figure 1.8. Wyoming Percent of Total Racial Minority* Population, any Ethnicity Per County, 2000

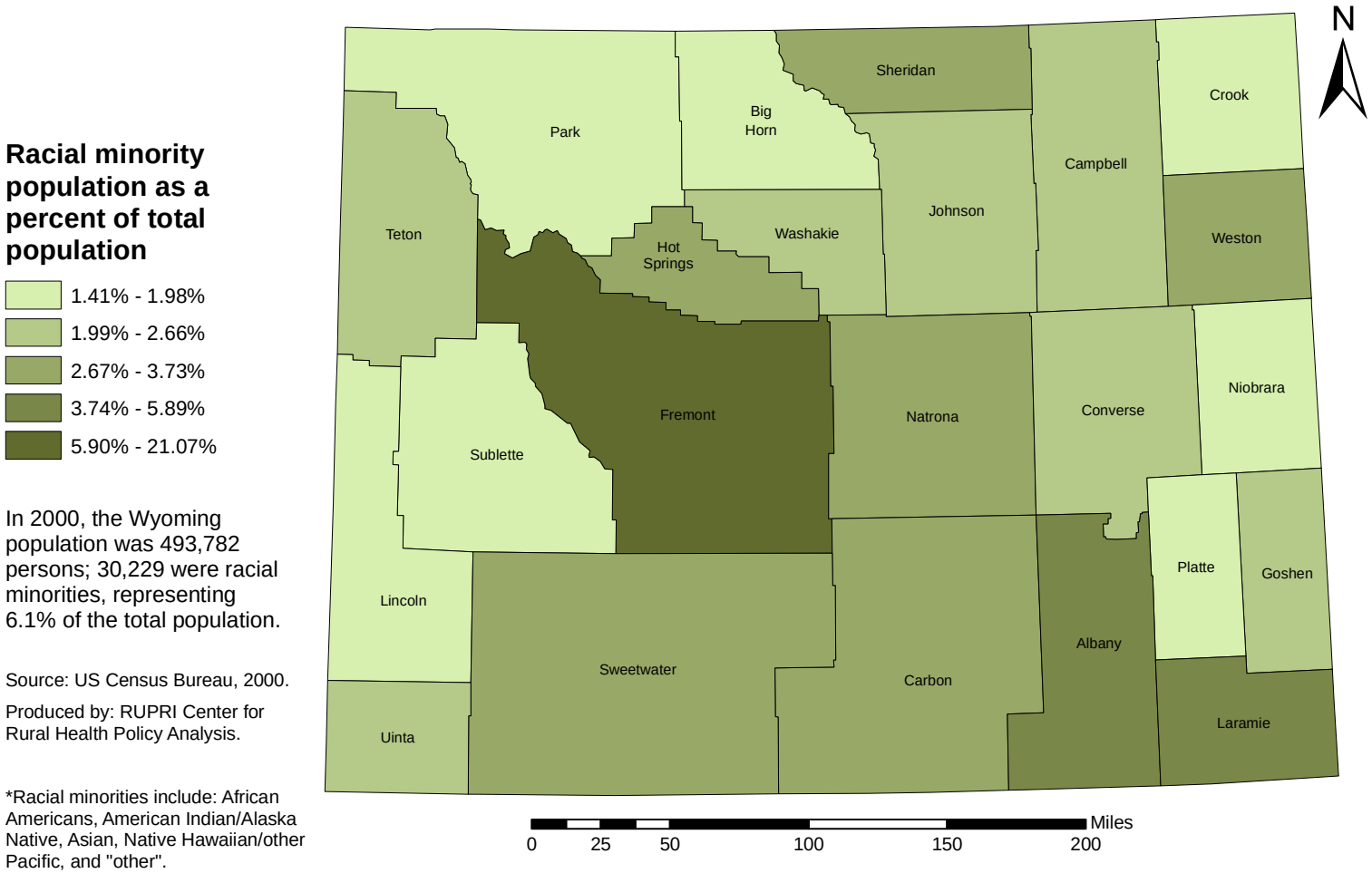


Figure 1.9. Wyoming Percent of Total Population of Hispanic Ethnicity, any Race Per County, 2000

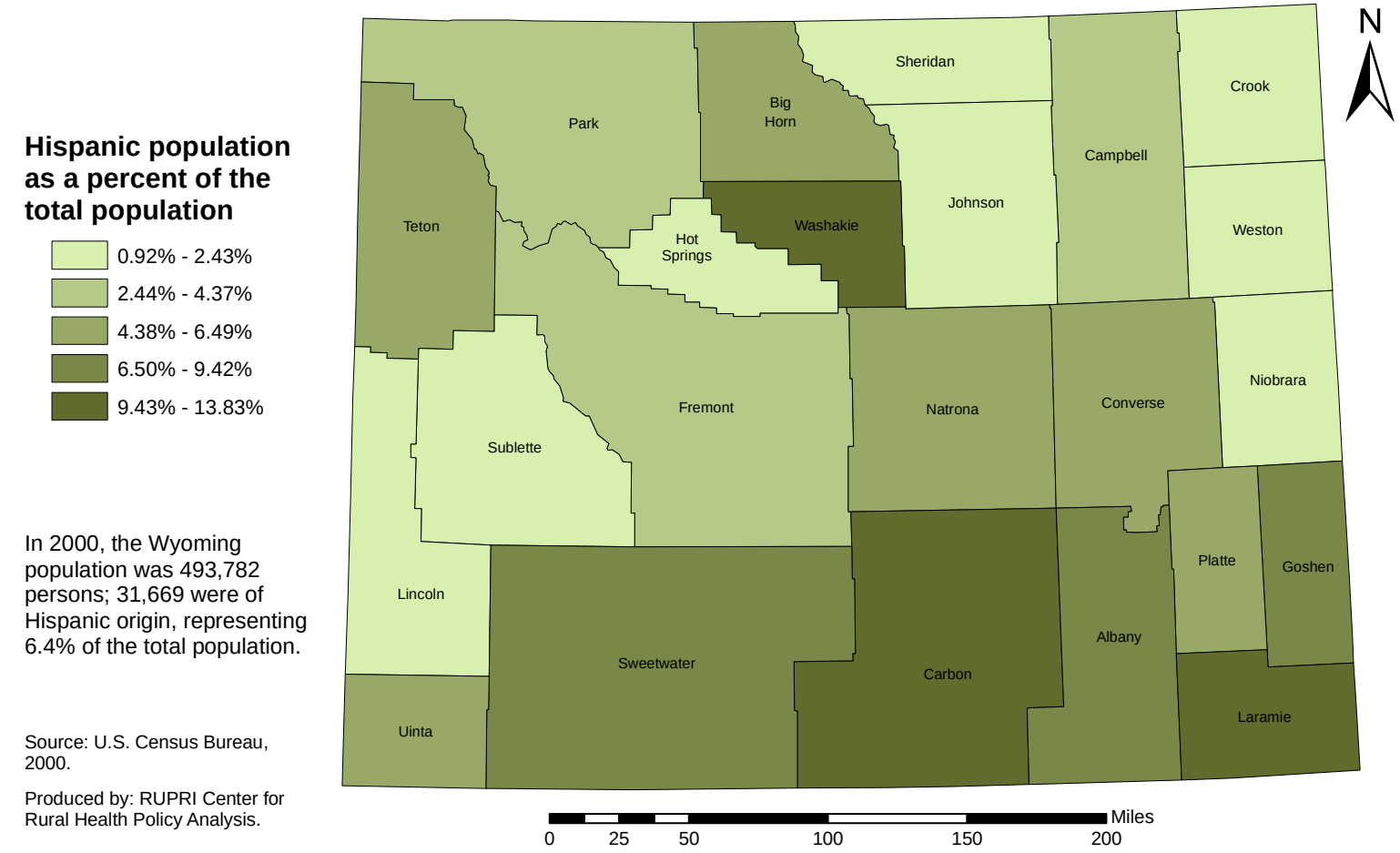
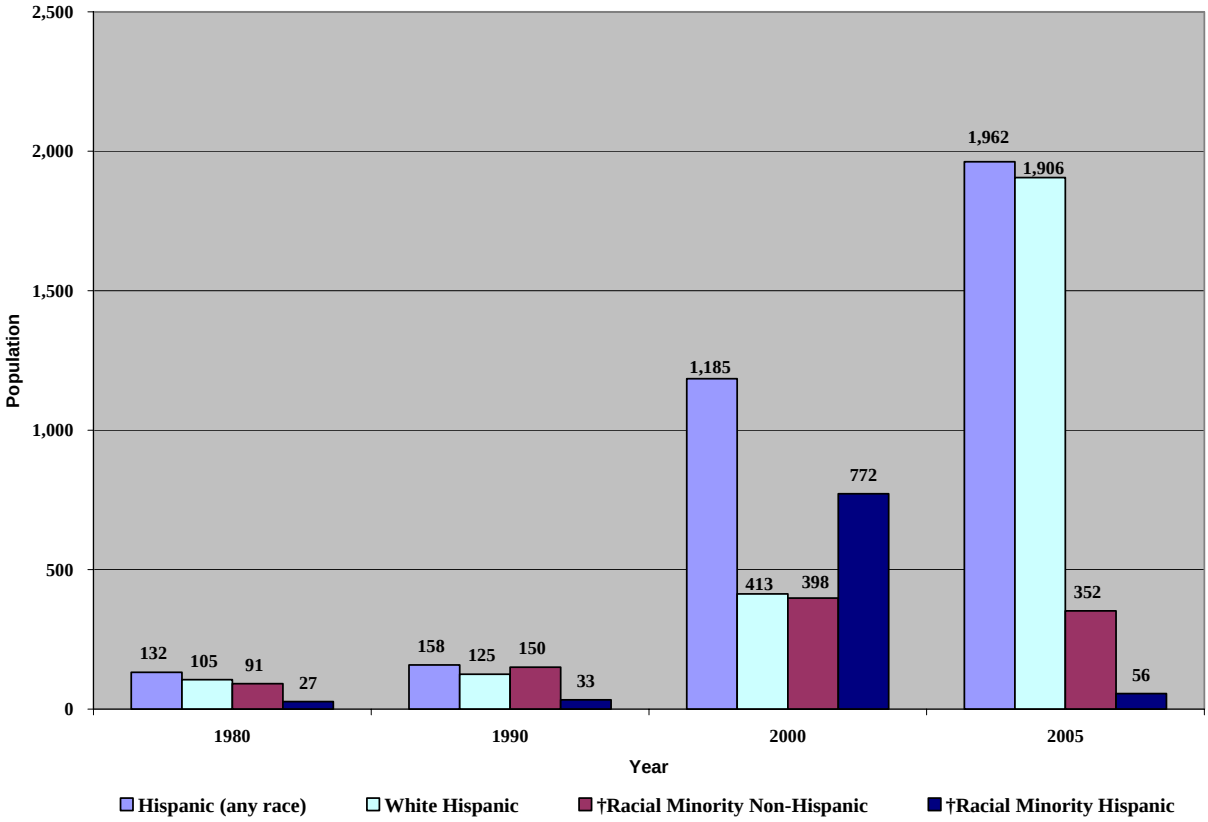


Figure 1.10. Racial Minority and Hispanic Ethnicity (any race) Population Census, Teton County 1980 to 2009



Sources: U.S. Department of Commerce, Bureau of the Census (http://www.census.gov/). 1980, 1990, 2000 Decennial Census Data and 2005 Population Estimates. 1980 data from GeoLytics, Inc., Census CD 1980 Short and Long Form; and Estimates, Projections, Consumer Expenditures and Profiles 2003/2008 (www.GeoLytics.com). 2005 data from Wyoming Economic Analysis Division (http://eadiv.state.wy.us)

*Calculations based on actual population data.
**Calculations based on population estimates and projections.
†Racial minorities include: Black, Native American (American Indian, Eskimo, Aleut), Japanese, Asian (Chinese, Filipino, Korean, Asian Indian), Native Hawaiian or Other Pacific Islander (Guam, Somoan), Some Other Race, and Two or More Races.

Note: Hispanic ethnicity includes Mexican, Puerto Rican, Cuban and Hispanic Other.
Note: "All Races" denotes all Hispanic and non-Hispanic whites and racial minorities (any race).
Note: "White; Hispanic" denotes whites alone of Hispanic origin.
Note: "White; Non-Hispanic" denotes whites alone, not of Hispanic origin.
Note: "Racial Minority; Hispanic" denotes racial minorities (any race) alone of Hispanic origin.
Note: "Racial Minority; Non-Hispanic" denotes racial minorities (any race) alone, not of Hispanic origin.

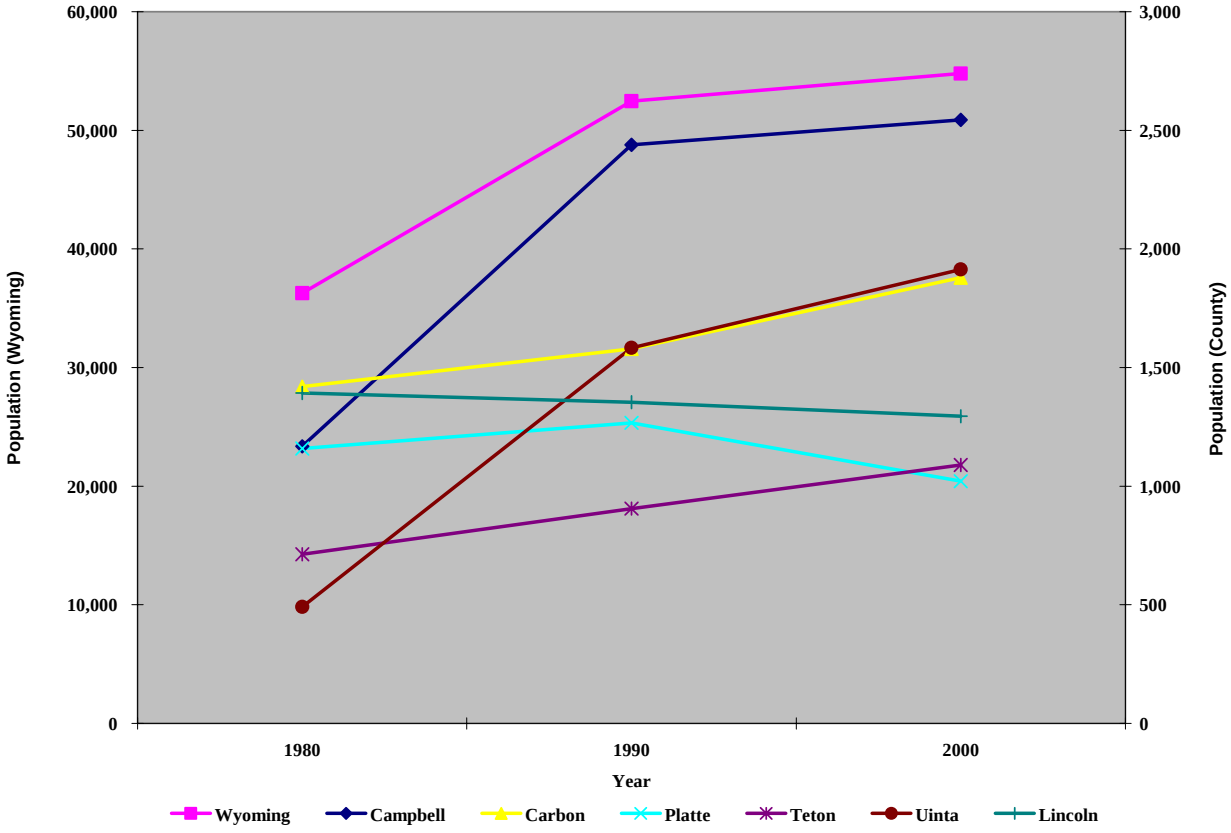
Economic Characteristics

Poverty and unemployment data were compiled to show trends from 1980 to 2000 to describe economic characteristics for Wyoming and selected counties. The findings are illustrated in detail in Figures 1.11 and 1.12 below. Economic characteristic data can be found in Appendix A, Tables A.14 – A.15.

Poverty

- Since 1980 the number of Wyoming residents who live below the Federal poverty level (FPL) has steadily increased. Between 1980 (36,268 persons below FPL) and 1990 (52,453 persons below FPL) the number of people who live below the FPL increased by approximately 44.6%, approximately 11.9% of the total population for which poverty status had been determined. This trend continued through 2000 but with much less intensity.
- With the exception of Lincoln and Platte Counties at the county level, most counties also experienced growth in the number of residents living below the FPL with the most significant increase evident in Uinta County between 1980 (491 persons below FPL) and 1990 (1,913 persons below FPL) where the FPL increased by 222.4%.

Figure 1.11. Residents below the Federal Poverty Level, Population Census by County, Wyoming 1980 to 2000

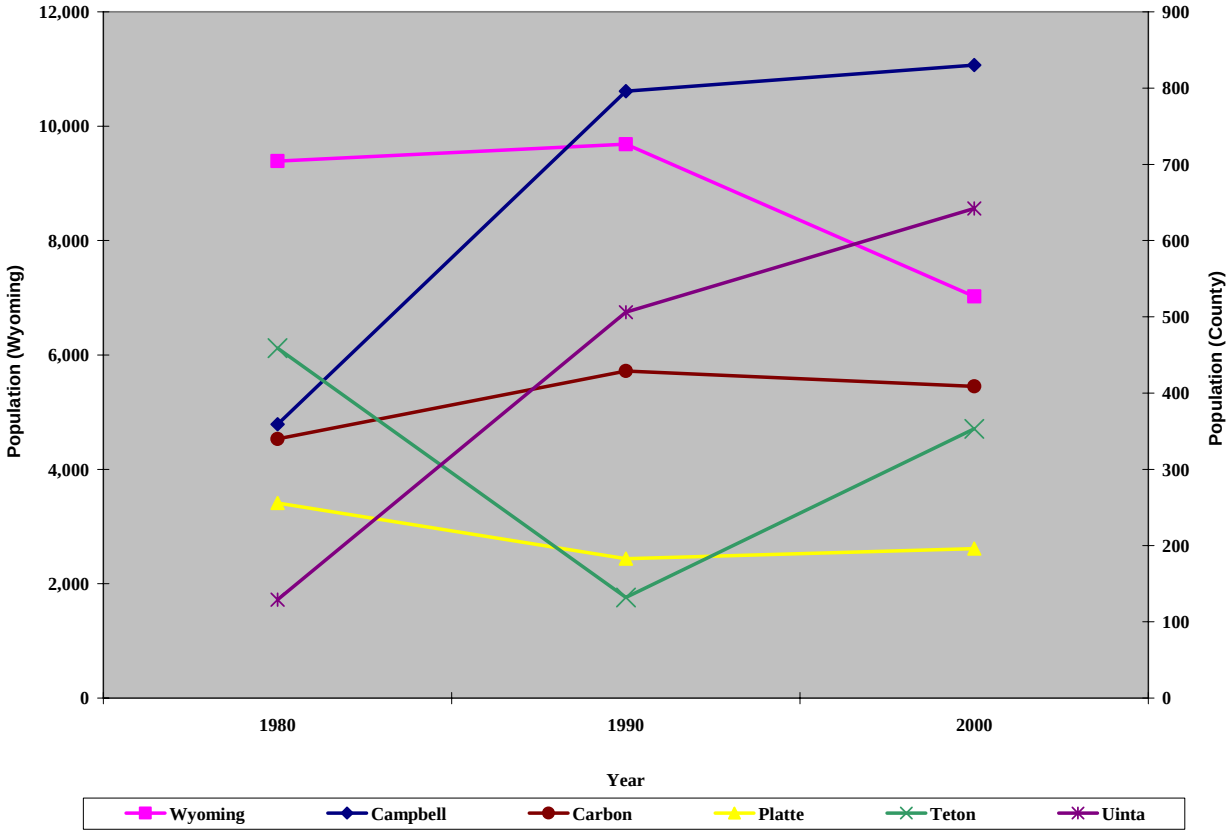


Source: U.S. Department of Commerce, Bureau of the Census (http://www.census.gov/). *1980, 1990, and 2000 Decennial Census Data* from Wyoming Department of Administration and Information, Economic Analysis Division http://eadiv.state.wy.us/demog_data/demographic.html.

Unemployment

- Overall, the number of Wyoming residents that are unemployed has been declining since 1980. Between 1980 (9,366 total civilian labor force unemployed) and 2000 (7,022 total civilian labor force unemployed) the total number of unemployed persons in the civilian labor force population declined by approximately 25.2%.
- At the county level, the number of people unemployed in Carbon County increased from 340 total civilian labor force unemployed in 1980 to 429 total civilian labor force unemployed in 1990, but began to decline by 2000 to 409 total civilian labor force unemployed representing a 4.7% decline in unemployment between 1990 and 2000.
- Similarly, Platte and Teton Counties experienced declines in unemployment between 1980 and 1990, but unlike Carbon County, began to increase again by 2000. Between 1980 and 1990 Platte County's unemployed population decreased from 256 unemployed persons to 183 unemployed persons in 1990 representing a 28.5% decline, but grew to 196 unemployed persons by 2000. Teton County's unemployment population declined dramatically by approximately 71.2% between 1980 (459 unemployed persons) and 1990 (132 unemployed persons), but by 2000 had increased back to 353 unemployed persons.
- In contrast, Campbell and Uinta Counties both experienced steady growth in unemployment between 1980 and 2000. Campbell County's unemployed population increased from 359 people unemployed in 1980 to 830 people unemployed in 2000, representing approximately 131.2% growth in the number of unemployed. Uinta County's unemployed population also increased dramatically from 1980 (129 unemployed persons) to 2000 (642 unemployed persons) by approximately 397.7%.

Figure 1.12. Unemployment, Civilian Labor Force, Population Census by County, Wyoming 1980 to 2000



Source: U.S. Department of Commerce, Bureau of the Census (http://www.census.gov/). *1980, 1990, and 2000 Decennial Census Data* from Wyoming Department of Administration and Information, Economic Analysis Division http://eadiv.state.wy.us/demog_data/demographic.html.

Summary

Historical and projected population trends indicate a steadily growing total population in Wyoming through 2020. Since 1980, Wyoming's population has grown older and has become more ethnically and racially diverse, indicating a changing demographic landscape. Although youth and working age populations are shrinking overall, there are pockets of increased unemployment and poverty evident throughout the state, an indicator that some counties may be sensitive to boom bust cycles and possibly susceptible to long recovery periods. As a result, the difficulty in recruiting and retaining young professionals outside of energy and extraction industries may be compounded.

Health Care Delivery System in Wyoming

Methods

To understand Wyoming's health care delivery system, we collected and analyzed population and provider data at different geographic scales from smallest to largest (block group, city/town, and county levels). Provider data were collected for 2006 and 2007 from UNMC's Health Professions Tracking Center, the RUPRI Center for Rural Health Policy Analysis, the RUPRI Community Information Resource Center, the Wyoming Office of Emergency Medical Services, and the National Council for Prescription Drug Programs. Information on provider shortages was gathered from RUPRI Community Information Resource Center, the Federal Health Resource and Services Administration, and the Dartmouth Health Atlas[11].

The data were compiled, analyzed, and mapped using a geographical information system developed in ArcGIS 9.1, 9.2 and ArcView 3.3[10]. Additional analyses were used to illustrate selected service area boundaries and distribution of selected providers across Wyoming. Calculations for Obstetrician-Gynecologist provider-to-population ratios were based on U.S. Census 2000 data, and completed for all Wyoming female residents aged 12 to 49 years.

Findings

Characterizing Service Areas in the State

Figure 1.13 shows Wyoming hospital locations and hospital service areas (HSAs) based on the Dartmouth Health Atlas[11]. The Dartmouth method defines HSAs as local health care markets for hospital care[12]. A service area is determined by the ZIP codes whose residents receive most of their hospitalizations from a specific hospital. Dartmouth assigns ZIP codes to the hospital area where, according to CMS data, the greatest proportion of Medicare residents were hospitalized. Minor adjustments are made to ensure geographic contiguity.

Wyoming has 14 hospitals with 25 or fewer beds, 13 hospitals with more than 25 beds, 2 Veterans Affairs hospitals with more than 25 beds, and 1 federal hospital with less than 25 beds. At least three of Wyoming's hospitals have service areas that reach across the Wyoming border into Colorado, Utah, or Montana. Wyoming counties that contain service areas of hospitals outside of the state include Carbon, Crook, Goshen, Lincoln, Niobrara, Park, and Teton.

Wyoming has a single referral region[13] that is anchored by the Wyoming Medical Center in Casper. (Figure 1.14) Several counties in Wyoming, including Albany, Big Horn, Campbell,

[10] ESRI, Redlands, CA, 2006
[11] Dartmouth Health Atlas, 2007 Geographic Query Finder http://www.dartmouthatlas.org/data/finder.shtm Accessed on June 28, 2007
[12] Dartmouth Health Atlas, 2007 Data and Methods http://www.dartmouthatlas.org/faq/data.shtm Accessed on July 16, 2007
[13] According to the 2007 Dartmouth Health Atlas, hospital referral regions (HRRs) represent regional health care markets for tertiary medical care. Each HRR contains at least one hospital that performs major cardiovascular

Lincoln, Park, Sublette, Teton, Uinta, and Washakie, belong entirely to a referral region from another state.

Wyoming has 7 federally-qualified health centers (FQHCs) in 5 counties (Figure 1.15). Wyoming's FQHCs include the Cheyenne Health and Wellness Center, the Community Health Center of Central Wyoming (in Casper with a satellite in Dubois), two Healthcare for the Homeless Clinics (in Laramie and Natrona counties), and two Wyoming Migrant Health Program locations (in Powell and Worland).

Wyoming also has 18 certified rural health clinics (CRHCs) in 10 counties (Figure 1.15). Big Horn county has the most CRHCs with one in Basin, one in Greybull, and two in Big Horn. The city of Lusk (population 1,447[14]) in Niobrara County has 3 CRHCs, which is the highest concentration of CRHCs in the state.

Wyoming has 31 skilled nursing facilities of any type, which exist in 18 counties (Figure 1.16). Wyoming has 29 dual certificate[17] skilled nursing facilities across 17 counties . Counties with no skilled nursing facility include Goshen, Johnson, Lincoln, Niobrara, and Platte. The city of Casper has 4 skilled nursing facilities; however, one facility only accepts Title XVIII[15] and private pay patients (i.e. it does not accept Medicaid). The facility in the city of Pinedale is the only skilled nursing facility in Sublette County. It is licensed for Title XVIII, Title XIX[16], and private pay but must allocate specific beds to each payer type[17].

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procedures and neurosurgery. In a similar fashion, HRRs are defined by assigning hospital service areas to the region where the greatest proportion of major cardiovascular procedures are performed, with minor modifications to achieve geographic contiguity, a minimum population size of 120,000, and a high localization index.

[14] U.S. Census Bureau, 2000 Summary File 1 and Summary File 3. http://factfinder.census.gov/home/ Accessed on June 28, 2007

[15] TITLE XVIII (18) of the U.S. Social Security Act—Health insurance for the aged and disabled (Medicare) http://www.ssa.gov/OP_Home/ssact/title18/1800.htm Accessed on June 28, 2007

[16] TITLE XIX (19) of the U.S. Social Security Act—Grants to states for medical assistance programs (Medicaid) http://www.ssa.gov/OP_Home/ssact/title19/1900.htm Accessed June 28, 2007

[17] Skilled nursing facilities that hold a dual certificate are allowed to place Title XVIII, Title XIX, or private pay patients in any open bed. Facilities licensed as Title XVIII only can provide services to Medicare or private pay patients only. Facilities with a Title XVIII and Title XIX license have a specific number of beds that are licensed for Medicare patients and a specific number licensed for Medicaid patients. These facilities are not allowed to place a Medicare patient in a Medicaid bed or vice-versa.

Figure 1.13. Location of Wyoming Hospitals and Service Areas

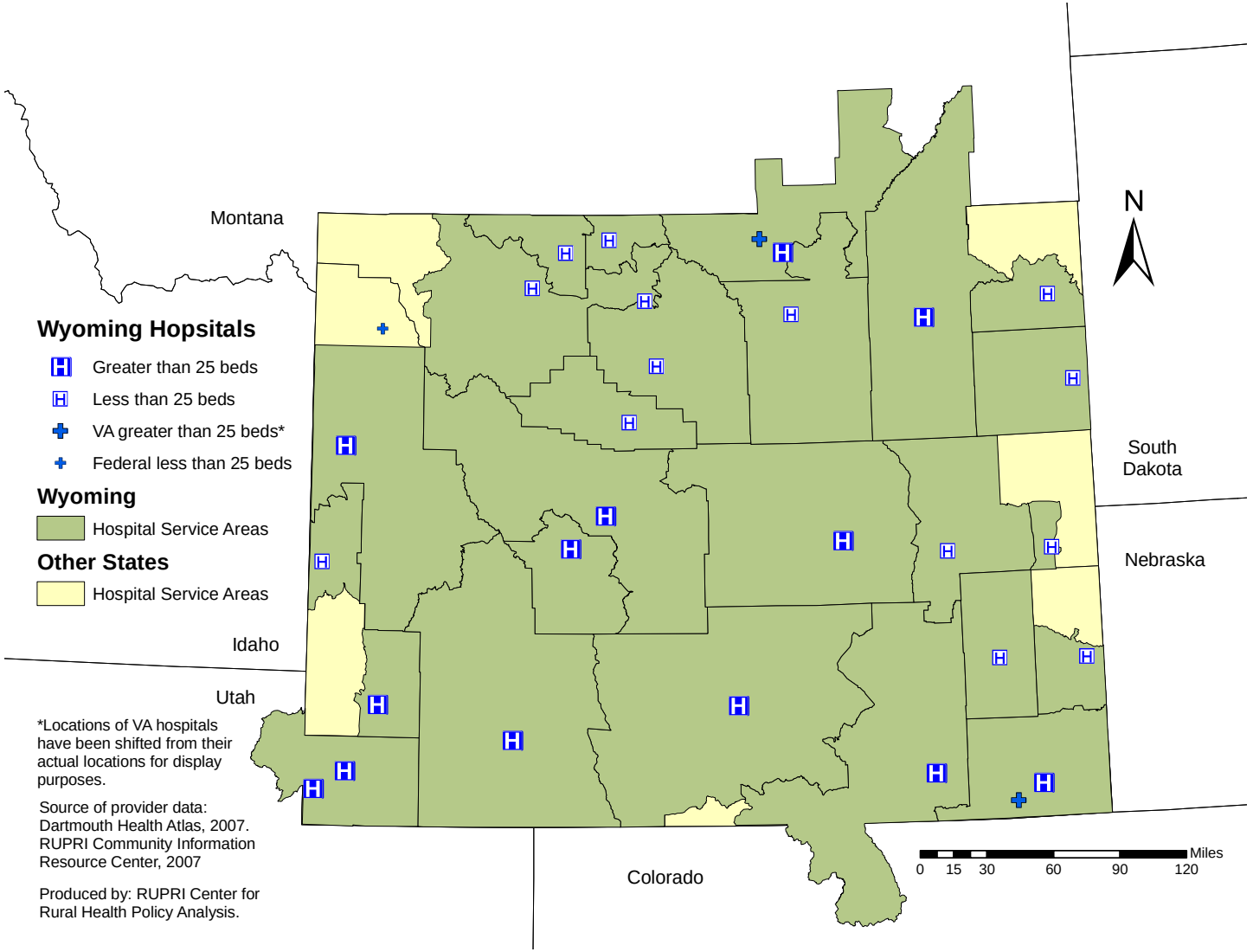


Figure 1.14. Wyoming Hospitals' Referral Region

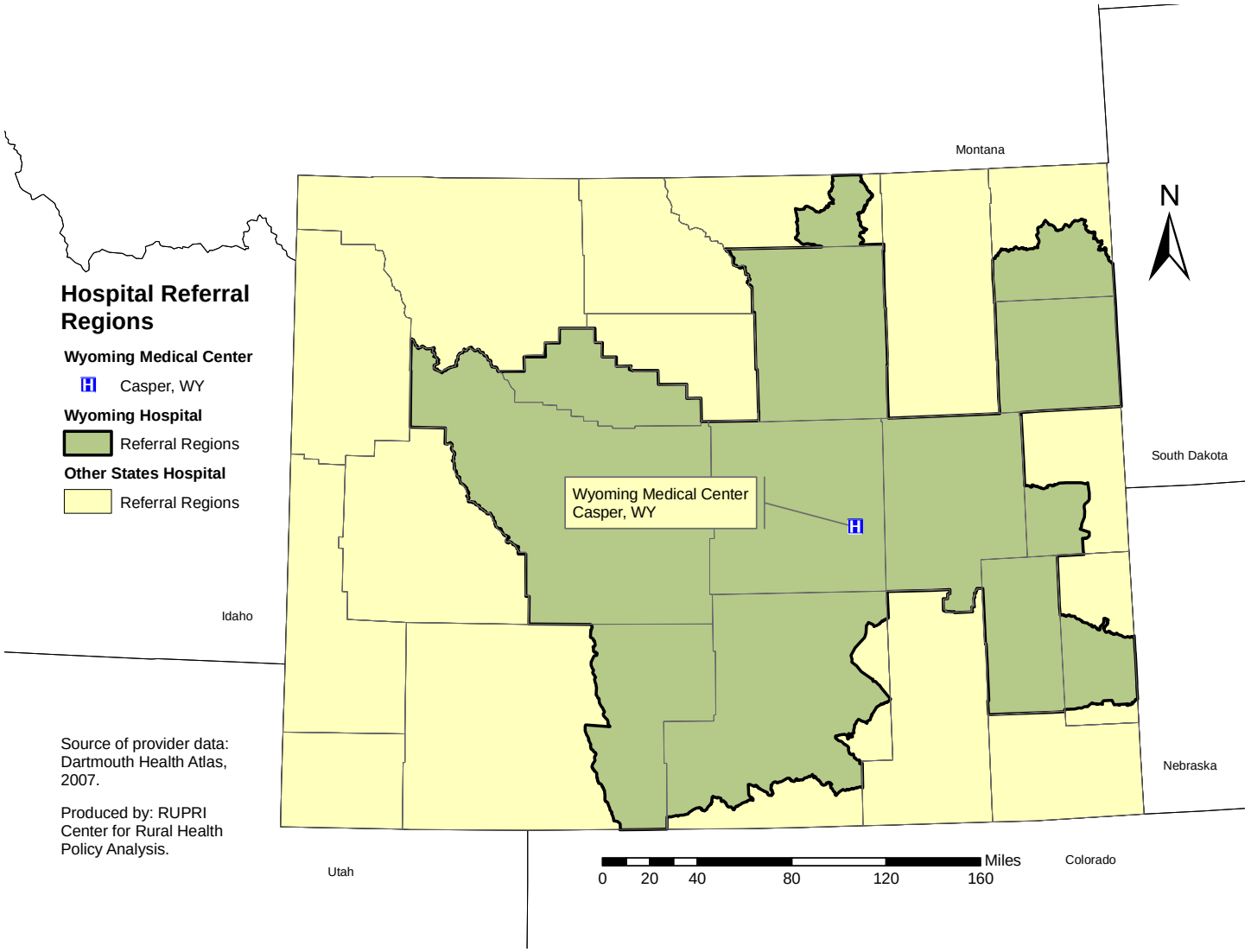
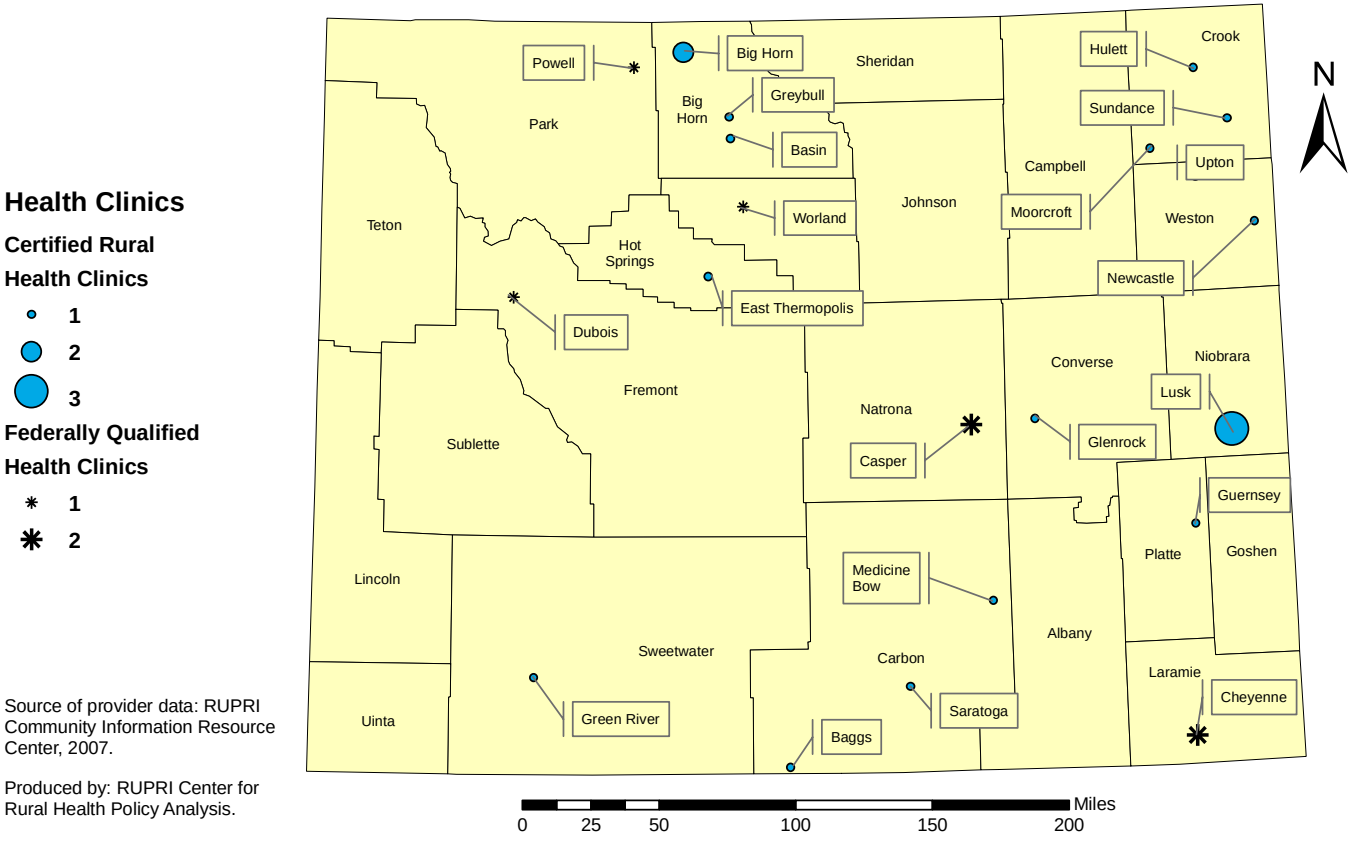


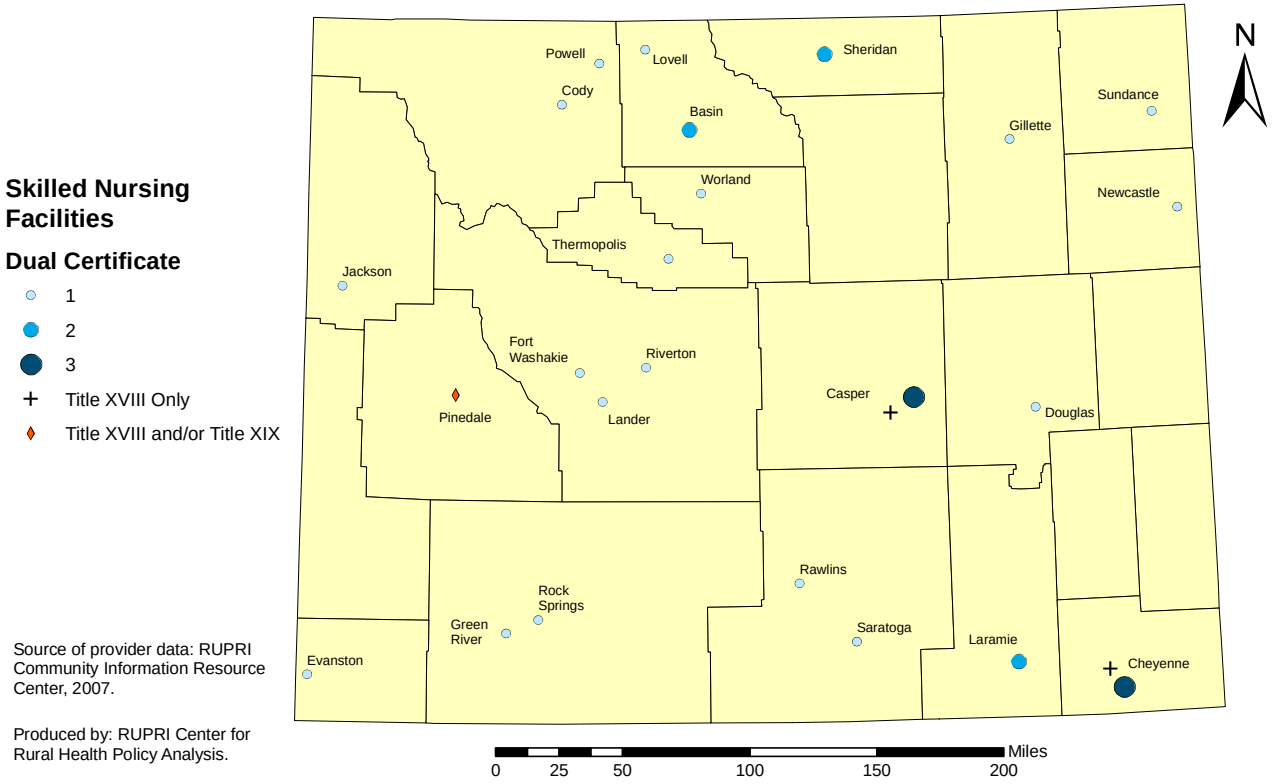
Figure 1.15. Location of Wyoming Health Clinics



Source of provider data: RUPRI Community Information Resource Center, 2007.

Produced by: RUPRI Center for Rural Health Policy Analysis.

Figure 1.16. Location of Wyoming Skilled Nursing Facilities



Skilled nursing facilities that hold a dual certificate are allowed to place Title XVIII, Title XIX, or private pay patients in any open bed. Facilities licensed as Title XVIII only can provide services to Medicare or private pay patients only. Facilities with a Title XVIII and Title XIX license have a specific number of beds that are licensed for Medicare patients and a specific number licensed for Medicaid patients. These facilities are not allowed to place a Medicare patient in a Medicaid bed or vice-versa.

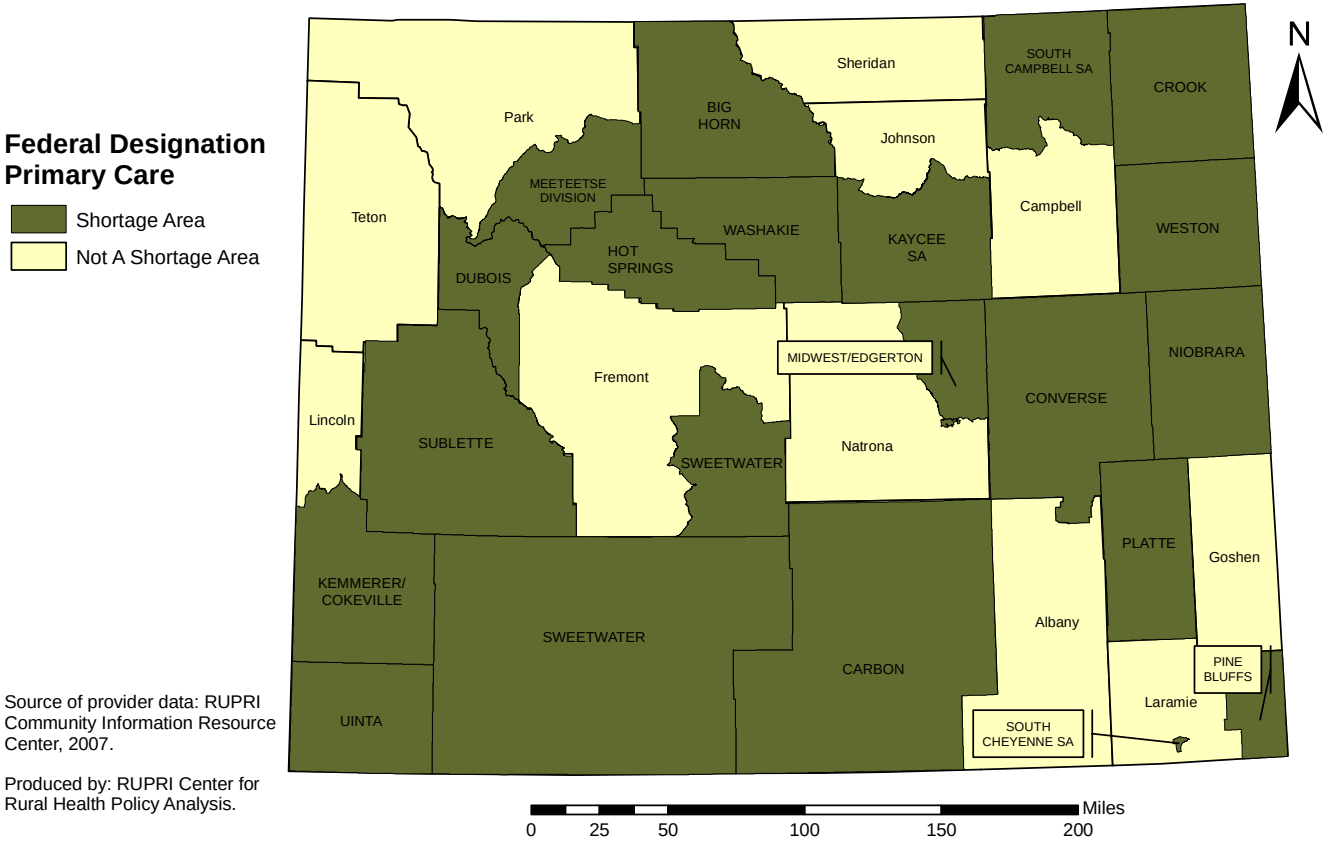
Health Care Professional Shortage Areas in Wyoming

The following maps show the counties or populations that are federally designated as 2007 health professional shortage areas (HPSAs) by the Health Resources and Services Administration. Criteria for shortage area designation appear in Appendix B. For primary medical care, 12 counties are designated single-county HPSAs, 7 counties have partial-county or special population HPSAs, and the remaining 4 counties have no designated areas or populations (Figure 1.17). For dental services, 12 counties have single-county HPSA designations and 11 counties have no HPSA designation (Figure 1.18).

For mental health services, all 23 counties have single-county HPSA designations, making the entire state a mental health shortage area. Furthermore, of the 23 counties with a mental health HPSA designation, 19 also have a single- or partial-county primary medical care HPSA designation.[18]

[18] Shortage area data reflected in the text and maps of this report are current as of April 6, 2007, when RUPRI data collection ended and report finalization began. Shortage area designations change periodically, and changes can be found on the Health Resources and Services Administration web site: http://hpsafind.hrsa.gov/. As of June 27, 2007, Wyoming designations have changed slightly. Changes in county HPSA designations include Sublette county (no longer contains any primary care HPSAs), Crook county (currently has a partial primary care HPSA designation), Natrona county (currently has a partial dental HPSA designation), and Laramie county (currently has a partial dental HPSA designation).

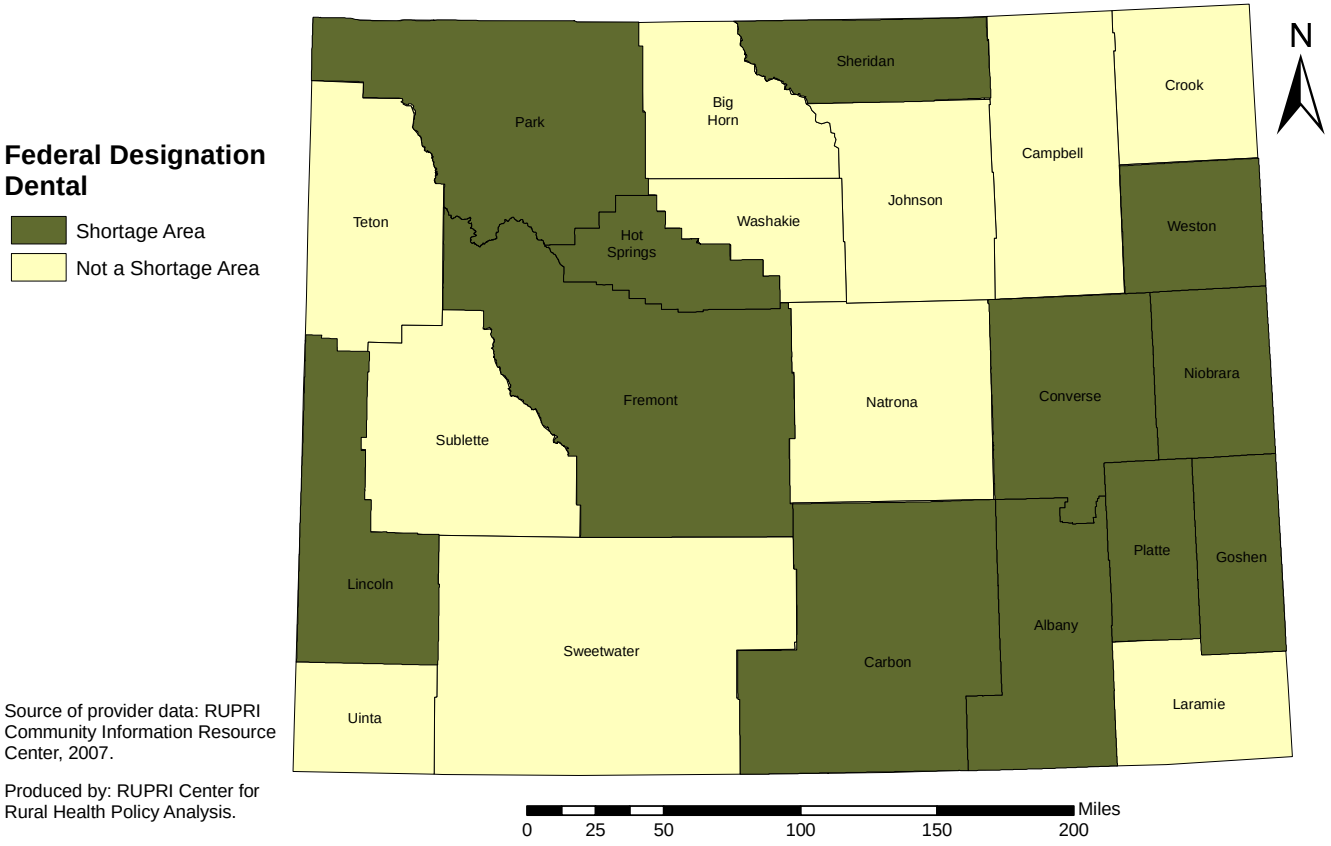
Figure 1.17. Federally Designated Primary Care Shortage Areas



Source of provider data: RUPRI Community Information Resource Center, 2007.

Produced by: RUPRI Center for Rural Health Policy Analysis.

Figure 1.18. Federally Designated Dental Shortage Areas



Source of provider data: RUPRI Community Information Resource Center, 2007.

Produced by: RUPRI Center for Rural Health Policy Analysis.

Distribution of Health Care Providers

This section shows the distribution of health care providers in Wyoming. Compared to all other cities in Wyoming, Casper and Cheyenne have the most physicians overall and the most primary care physicians. (Figures 1.19 and 1.20)

Laramie, Fremont, and Campbell counties have the highest number of emergency medical physicians (between 7 and 9 per county). However, nine counties have no emergency medical physician: Big Horn, Crook, Goshen, Hot Springs, Johnson, Lincoln, Niobrara, and Weston. (Figure 1.21)

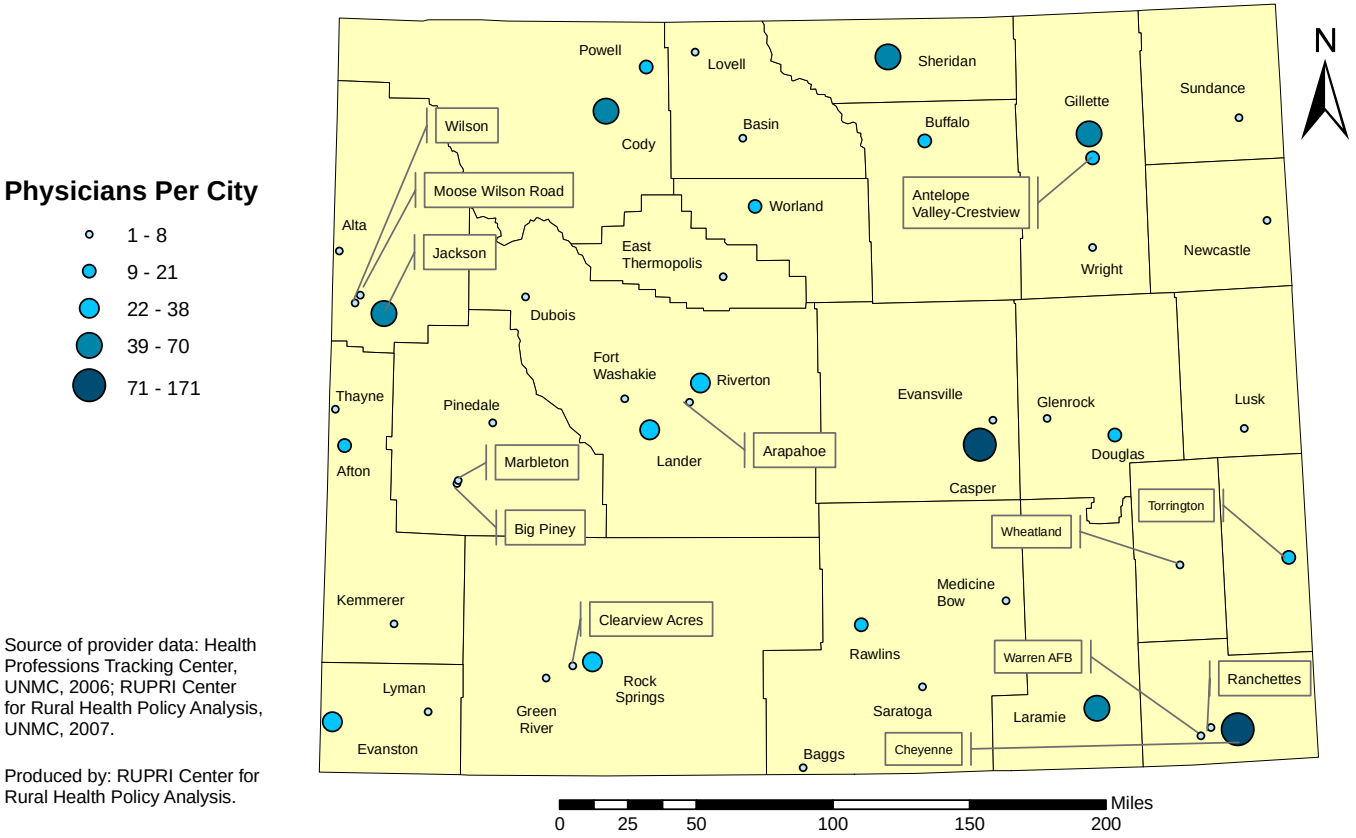
Fourteen counties have either none or only 1 Ob/Gyn practitioner (Figure 1.22). The provider-to-patient population ratio for Ob/Gyn shows that 11 counties have no Ob/Gyn practitioners per 100,000 females aged 12-49 years. (Figure 1.23) Compared to other cities in Wyoming, Cheyenne, Casper and, Jackson have the most Ob/Gyn practitioners

Casper and Cheyenne have the highest number of dentists (between 20 and 38 per city). One county, Niobrara, has no practicing dentists. (Figure 1.24)

Nine of Wyoming's counties have 2 or more psychiatrists. The remaining two-thirds of Wyoming counties have either none or only 1 psychiatrist: twelve counties have no psychiatrist and 2 counties have only one. (Figure 1.25)

All counties in Wyoming have at least one registered pharmacist (Figure 1.26) and at least one Physician Assistant (Figure 1.27). With the exception of Johnson County, all counties in Wyoming have at least one advanced nurse practitioner (APRN). It is possible that Johnson County receives APRN services from other counties. For example, the nurse practitioners in Sheridan County are located in Story, WY, which is on the Sheridan-Johnson border. (Figure 1.28)

Figure 1.19. Distribution of Wyoming Physicians



Source of provider data: Health Professions Tracking Center, UNMC, 2006; RUPRI Center for Rural Health Policy Analysis, UNMC, 2007.

Produced by: RUPRI Center for Rural Health Policy Analysis.

Figure 1.20. Distribution of Wyoming Primary Care Physicians

Primary Care Physicians Per City

- 1 - 3
- 4 - 7
- 8 - 11
- 12 - 19
- 20 - 49

*Primary care physicians include Internal Medicine Practicioners, General Practitioners, and Family Physicians.

Source of provider data: Health Professions Tracking Center, UNMC, 2006; RUPRI Center for Rural Health Policy Analysis, UNMC, 2007.

Produced by: RUPRI Center for Rural Health Policy Analysis.

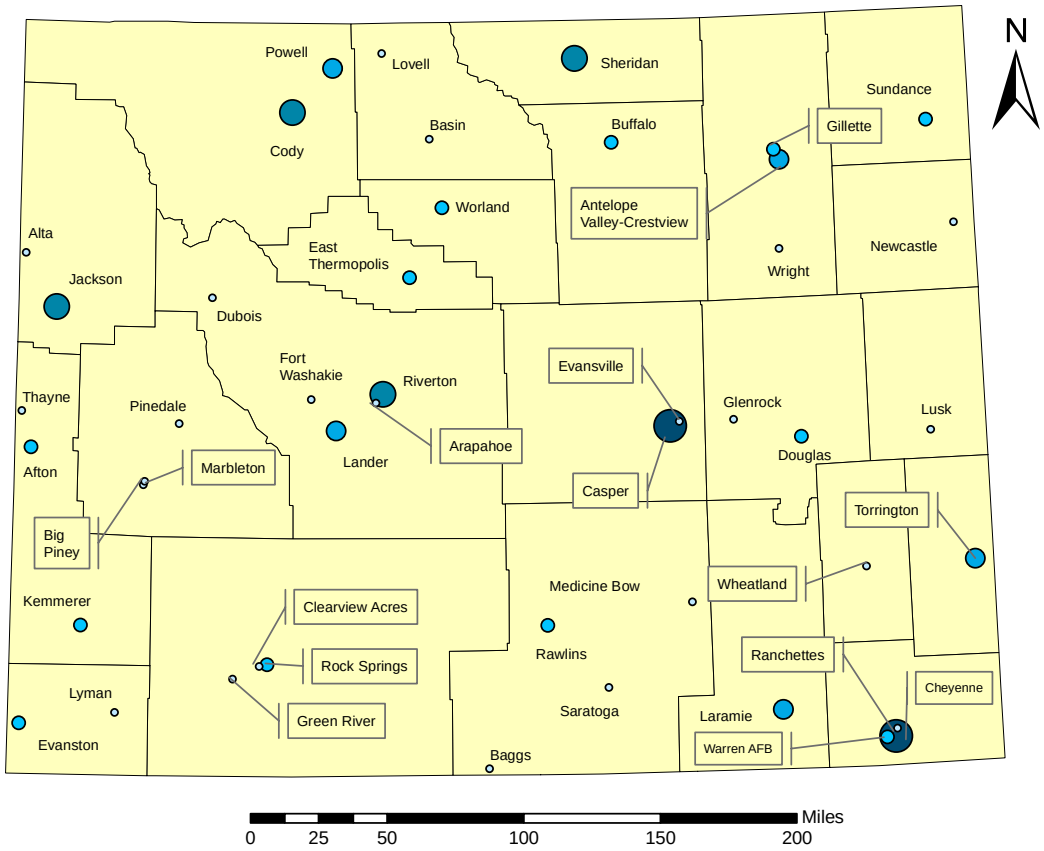
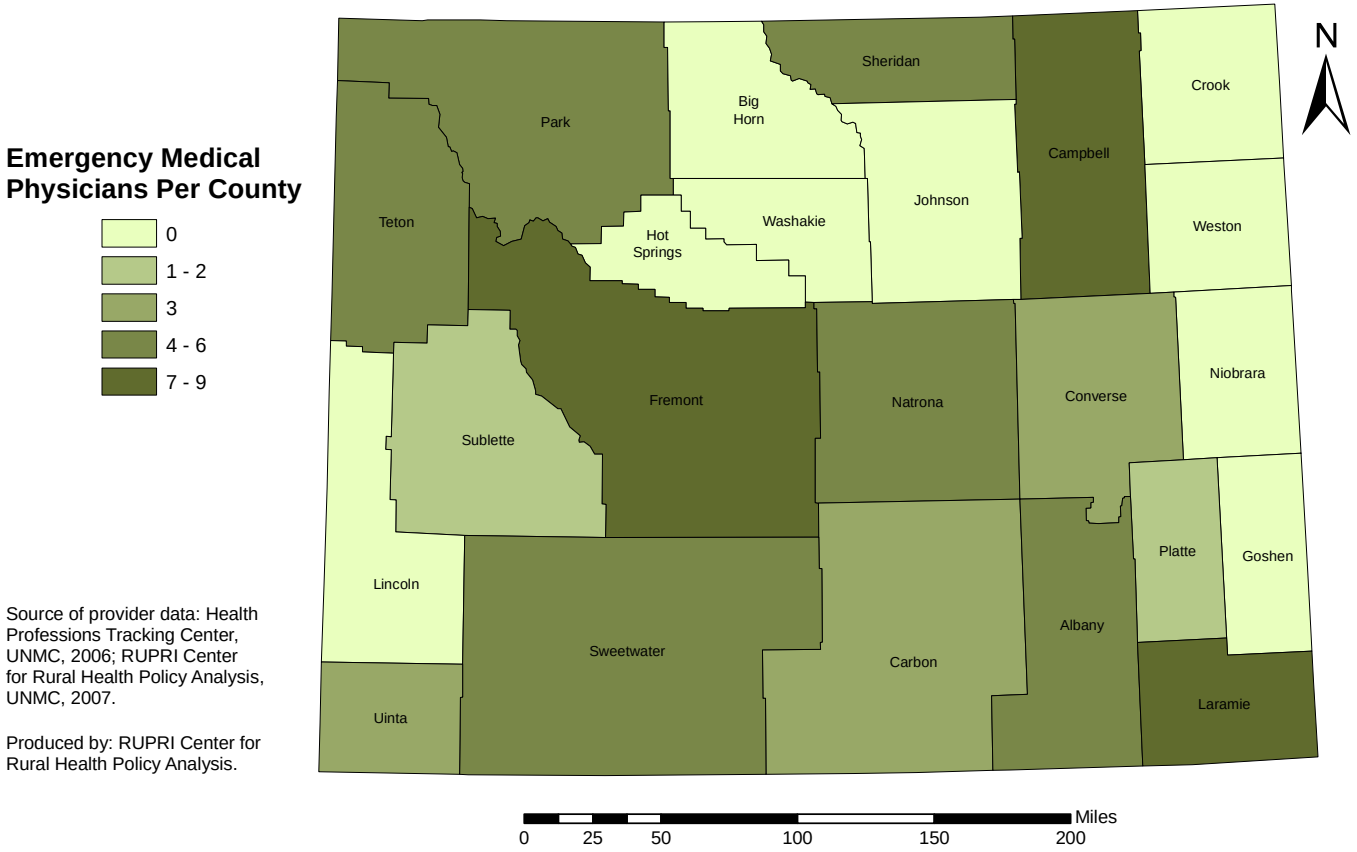


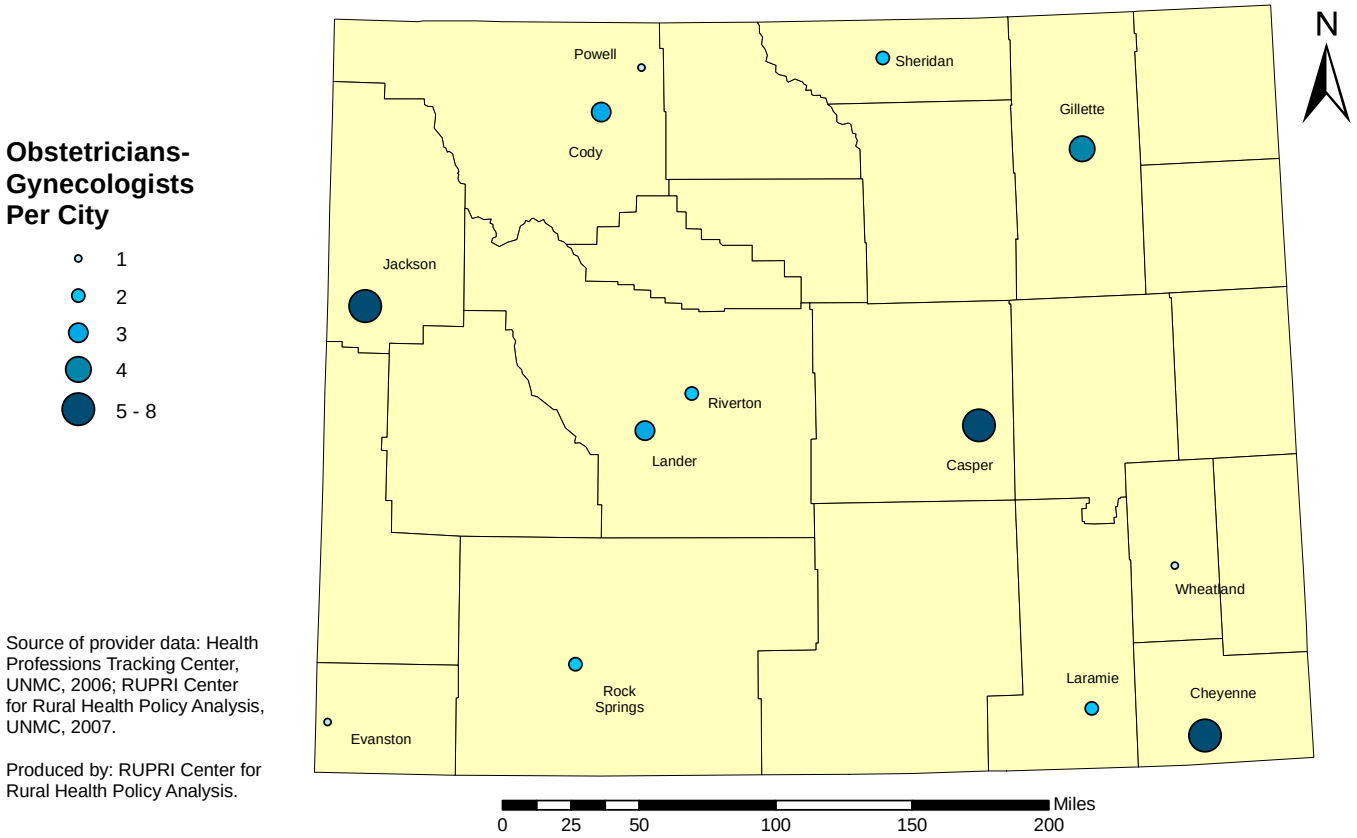
Figure 1.21. Distribution of Wyoming Emergency Medical Physicians



Source of provider data: Health Professions Tracking Center, UNMC, 2006; RUPRI Center for Rural Health Policy Analysis, UNMC, 2007.

Produced by: RUPRI Center for Rural Health Policy Analysis.

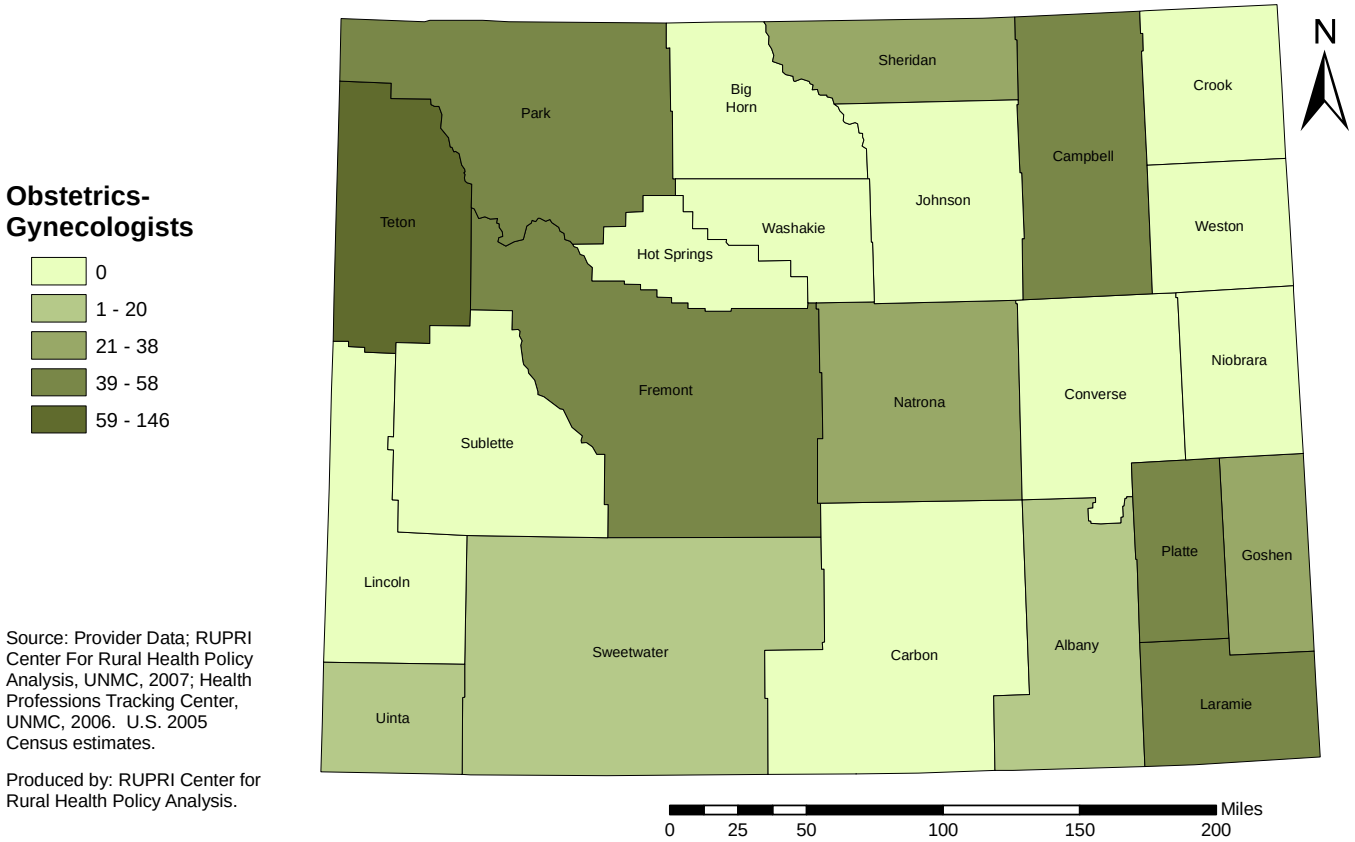
Figure 1.22. Distribution of Wyoming Obstetricians-Gynecologists



Source of provider data: Health Professions Tracking Center, UNMC, 2006; RUPRI Center for Rural Health Policy Analysis, UNMC, 2007.

Produced by: RUPRI Center for Rural Health Policy Analysis.

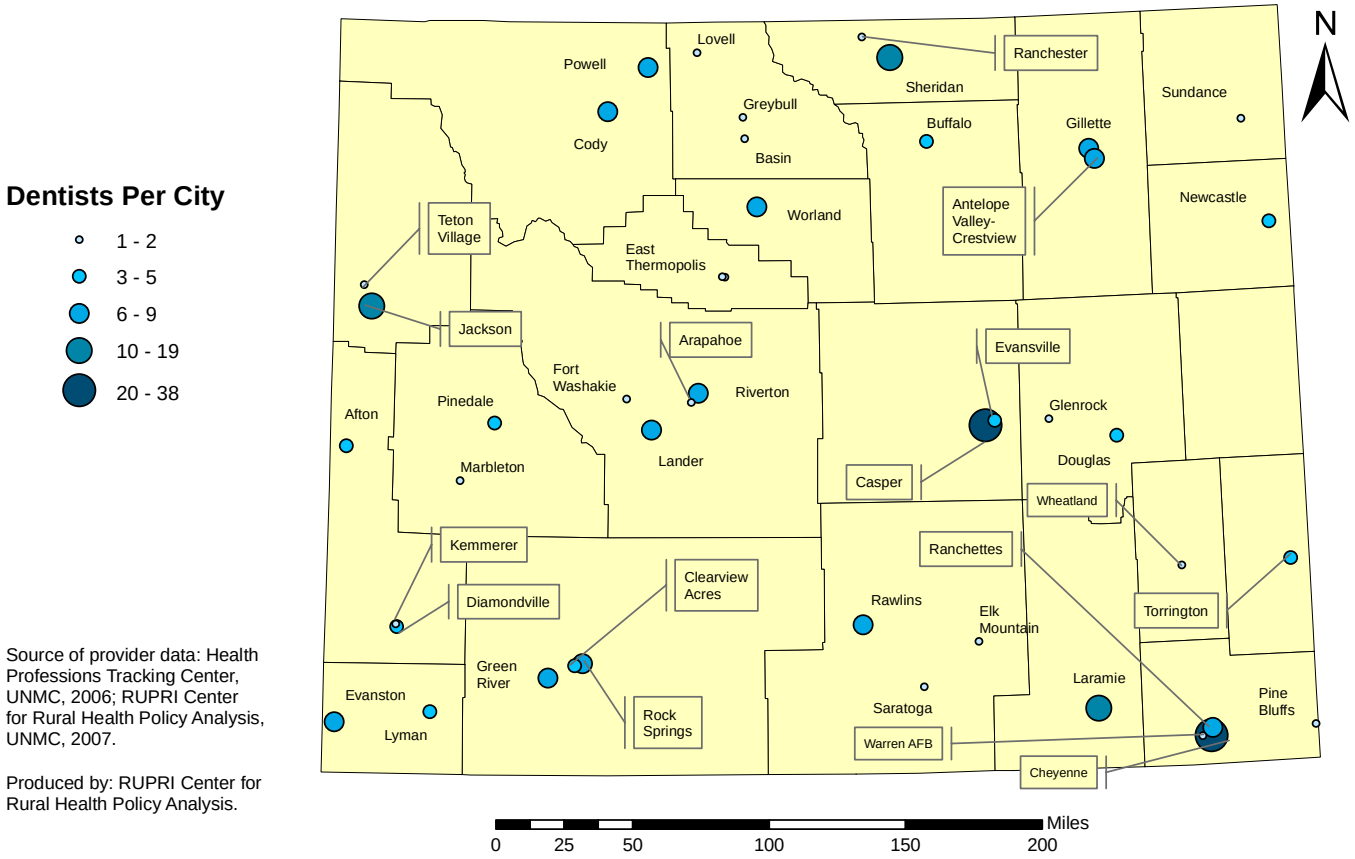
Figure 1.23. Wyoming Obstetricians-Gynecologists per 100,000 Females Age 12-49 years



Source: Provider Data; RUPRI Center For Rural Health Policy Analysis, UNMC, 2007; Health Professions Tracking Center, UNMC, 2006. U.S. 2005 Census estimates.

Produced by: RUPRI Center for Rural Health Policy Analysis.

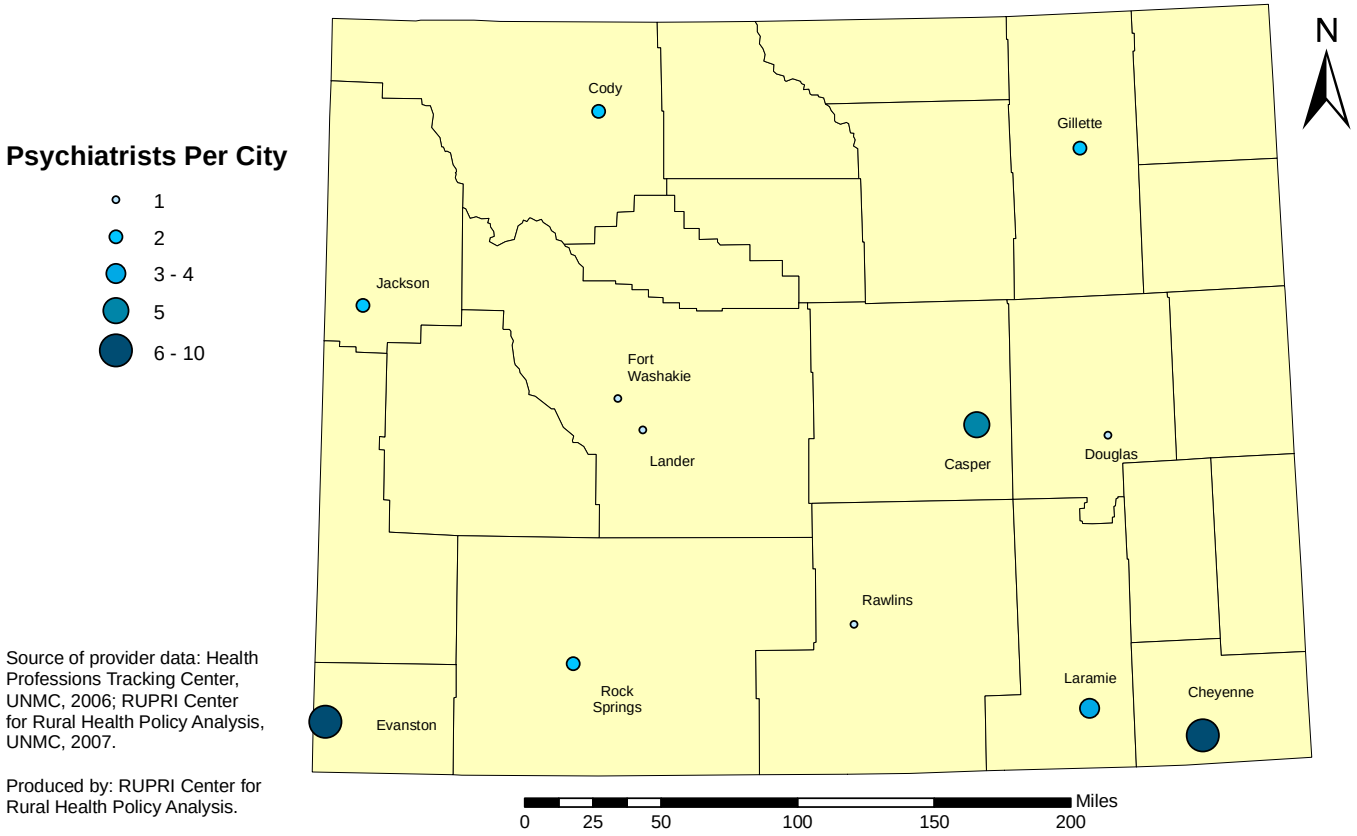
Figure 1.24. Distribution of Wyoming Dentists



Source of provider data: Health Professions Tracking Center, UNMC, 2006; RUPRI Center for Rural Health Policy Analysis, UNMC, 2007.

Produced by: RUPRI Center for Rural Health Policy Analysis.

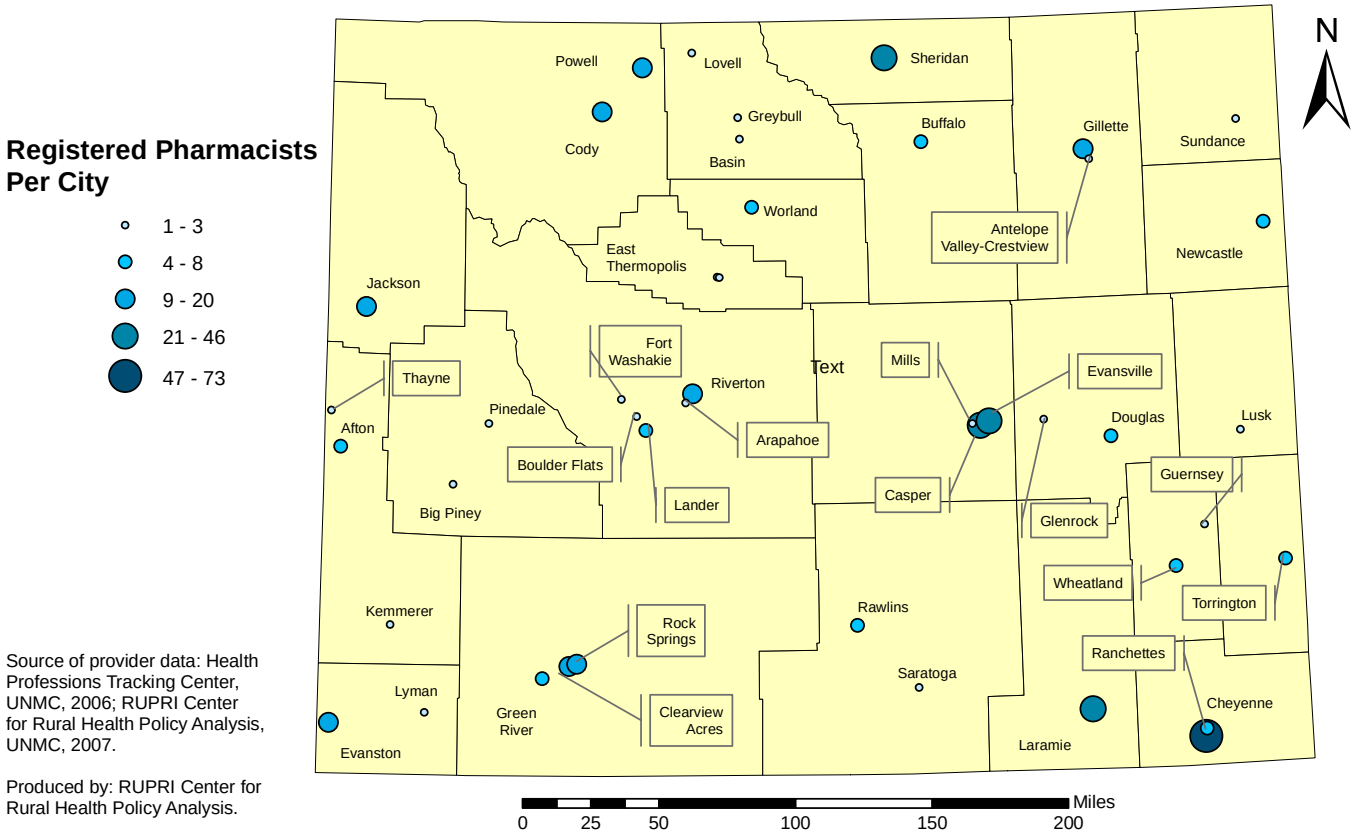
Figure 1.25. Distribution of Wyoming Psychiatrists



Source of provider data: Health Professions Tracking Center, UNMC, 2006; RUPRI Center for Rural Health Policy Analysis, UNMC, 2007.

Produced by: RUPRI Center for Rural Health Policy Analysis.

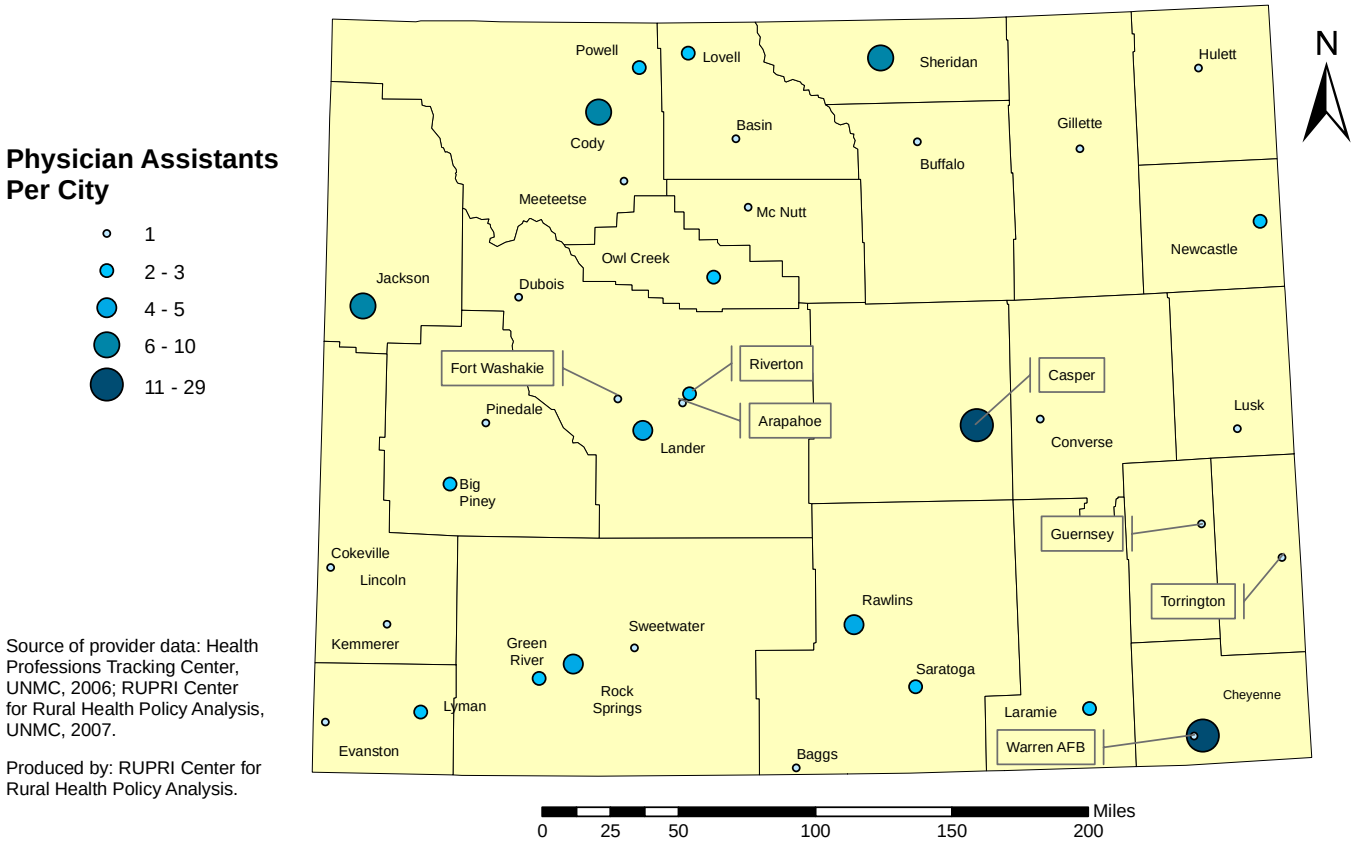
Figure 1.26. Distribution of Wyoming Registered Pharmacists



Source of provider data: Health Professions Tracking Center, UNMC, 2006; RUPRI Center for Rural Health Policy Analysis, UNMC, 2007.

Produced by: RUPRI Center for Rural Health Policy Analysis.

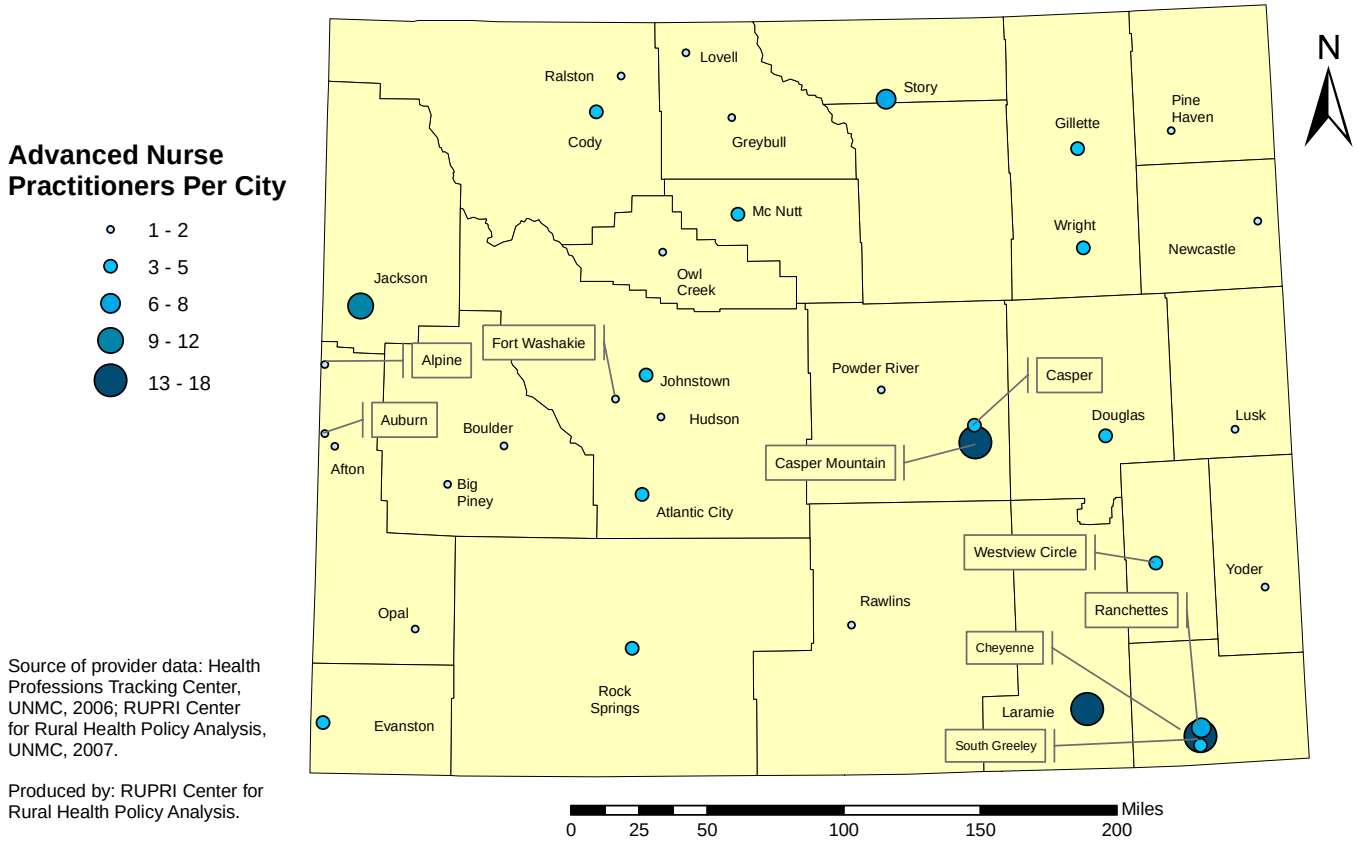
Figure 1.27. Distribution of Wyoming Physician Assistants



Source of provider data: Health Professions Tracking Center, UNMC, 2006; RUPRI Center for Rural Health Policy Analysis, UNMC, 2007.

Produced by: RUPRI Center for Rural Health Policy Analysis.

Figure 1.28. Distribution of Wyoming Advanced Nurse Practitioners



Source of provider data: Health Professions Tracking Center, UNMC, 2006; RUPRI Center for Rural Health Policy Analysis, UNMC, 2007.

Produced by: RUPRI Center for Rural Health Policy Analysis.

Transportation Services for Health Care Delivery

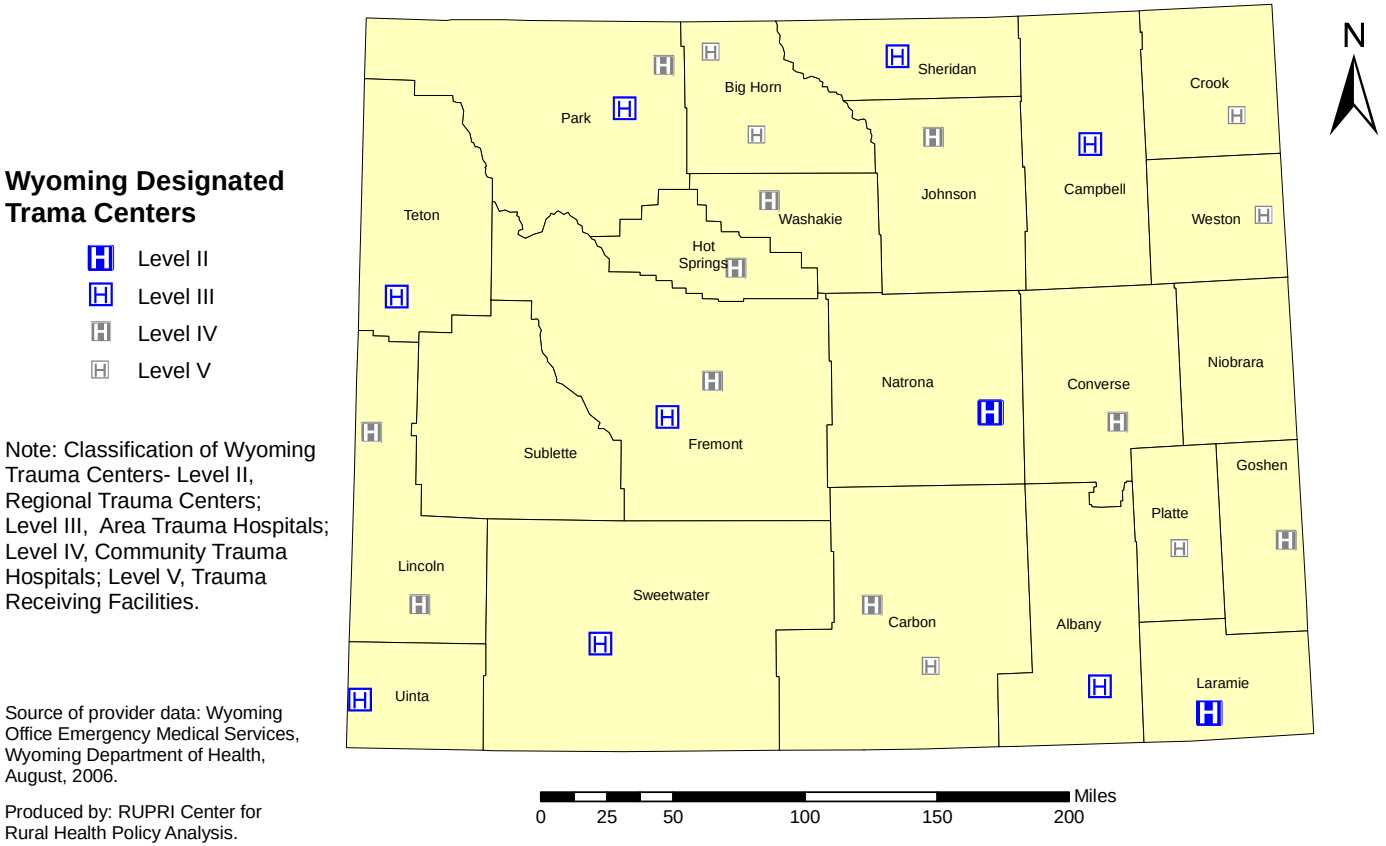
In rural communities, access to health care facilities is largely influenced by the proximity of providers. Whether emergent or non-emergent health needs, access to transportation is an enabling factor in receiving timely care.

Emergency care in Wyoming is supported by 26 designated trauma centers statewide. (Figure 1.29) Two facilities - Wyoming Medical Center (Casper, WY) and United Medical Center (Cheyenne, WY) provide level II trauma care.[19] A 2005 American Trauma Society – Trauma Information and Exchange program study found that only 30% of Wyoming residents have access to level I or II trauma centers (in Wyoming or neighboring states) within 45 minutes by either ground or air emergency transportation. Wyoming residents' access increases to 33% when the travel time is extended to 60 minutes. The remaining 67% of Wyoming residents must travel more than 60 minutes to the nearest level I or II trauma center. Of the 33% that have access to level I or II trauma centers within 60 minutes, 2.1% have their access needs met by centers located outside of Wyoming.[20]

[19] American College of Surgeons. *Resources for Optimal Care of the Injured Patients*. 4th ed. Chicago, IL: American College of Surgeons: 1999

[20] Branas, C.C., MacKenzie, E.J., Williams, E.C., Schwab, C.W., Teter, H.M, Flanigan, M.C. et al. (2005). Access to Trauma Centers in the United States. *JAMA, 293(21),* 2626-2633

Figure 1.29. Distribution of Wyoming Trauma Centers



Specific to ground transportation, Wyoming has 74 ambulance agencies that provide prehospital emergency medical services (EMS). Almost half these authorized agencies are community, non-profit agencies or affiliated with the local fire department. The vast majority of these agencies are authorized as EMT-Intermediate agencies (n=50) with limited medical privileges for procedures and medications (as defined by the Wyoming Board of Medicine and the Office of Emergency Medical Services). Of the 14 agencies authorized to provide EMT-Paramedic services, only 5 agencies currently have the capacity to provide 24 hour paramedic services. (Figure 1.30)

Figure 1.30. Distribution of Wyoming Authorized Ambulance Agencies

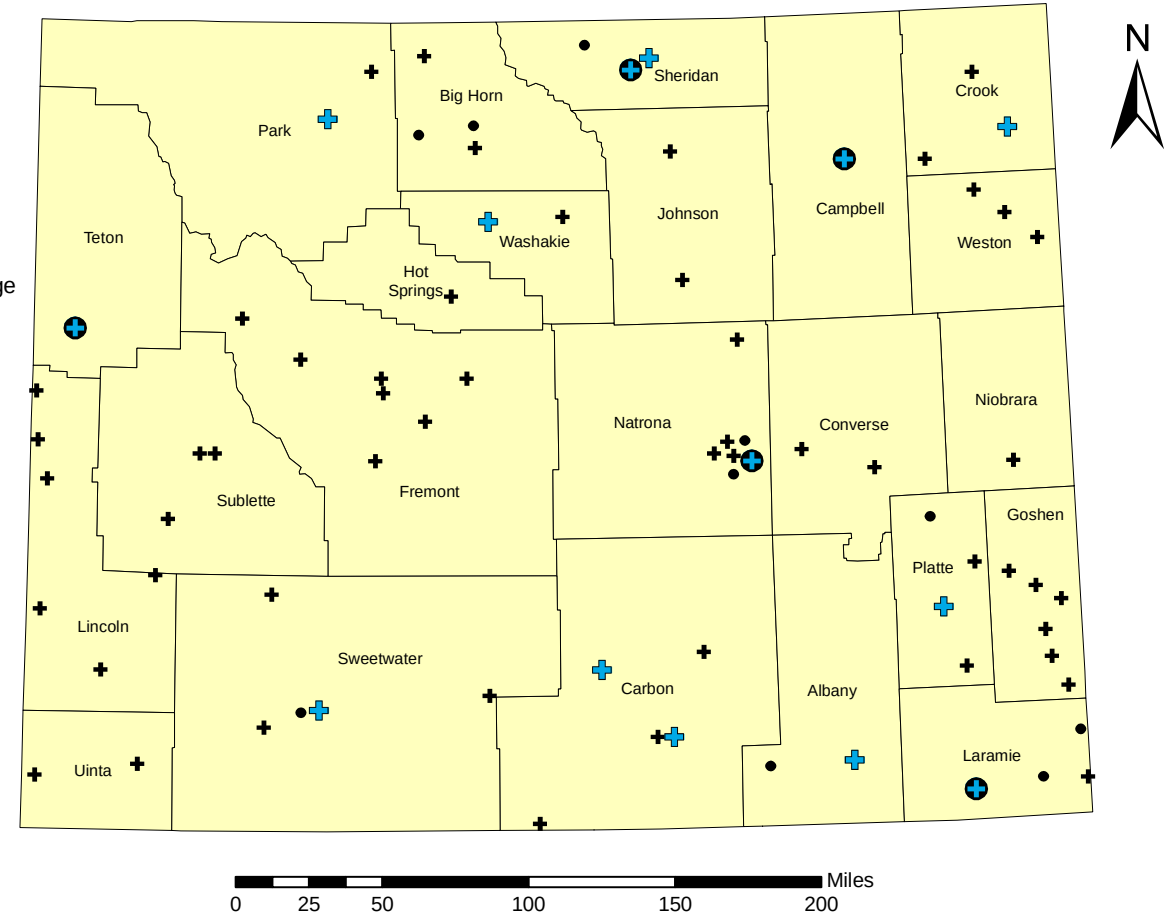
Location of Authorized Ambulance Agencies

- EMT-Paramedic, 24 Hr Coverage
- EMT-Paramedic
- EMT- Intermediate
- EMT- Basic

NOTES: Authorized level of service by the Divison, the Task Force on Prehospital Care, and the Board of Medicine. Actual service provided may be at a lower level due to lack of staffing.

Source of provider data: Wyoming Office Emergency Medical Services, Wyoming Department of Health, June, 2007.

Produced by: RUPRI Center for Rural Health Policy Analysis.



Wyoming's prehospital EMS system is heavily dependent on volunteers from the local community to fill staffing needs. Aggregated statewide data from the Wyoming Office of Emergency Medical Services show over 77% of all certified ambulance personnel are classified as volunteer (non-paid) or part-time (compensated to some degree). Furthermore, 44% of the state's authorized ambulance agencies are entirely staffed by volunteer personnel. (Figure 1.31)

The Wyoming Public Transit Association (WPTA) is a private non-profit organization of over 50 transit-only and social services agencies that provides transportation for non-emergent care. WPTA's service area reaches across all 23 counties in Wyoming. The average cost per one-way trip with WPTA is $5.50 per person. According to WPTA, in FY 2004 over 66,000 residents received a total of 1.9 million one-way rides through the program. Approximately 887 seniors were served and 67,300 rides were provided for health care specific needs.[21] (Table 1.1)

21 Wyoming Public Transit Association (2005). http://www.wytrans.org/

Figure 1.31. Location and Status of Prehospital Emergency Medical Services Personnel

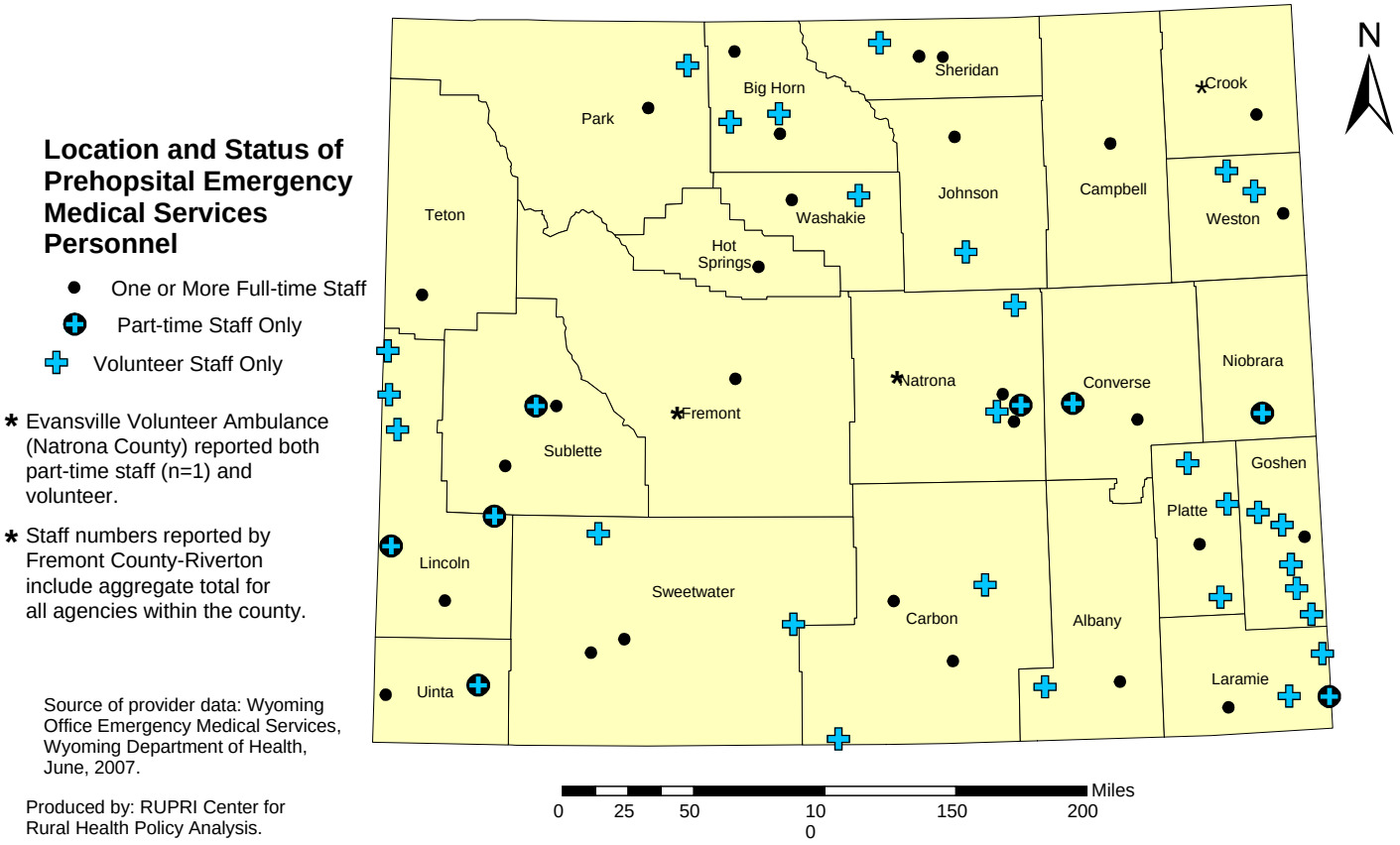


Table 1.1. Travel Distance Between Selected Cities in Wyoming and Surrounding States

MILEAGE BETWEEN CITIES	Casper	Cheyenne	Cody	Evanston	Gillette	Jackson	Laramie	Rawlins	Riverton	Rock Springs	Sheridan	Billings, MT	Fort Collins, CO	Rapid City, SD	Salt Lake City, UT	Scotts-bluff, NE	Spear-fish, SD
Casper		179	214	325	182	283	148	116	120	224	148	277	222	254	409	176	276
Cheyenne			393	357	247	432	50	149	270	257	327	456	46	310	437	108	301
Cody				379	250	301	386	288	138	280	149	106	435	391	580	389	346
Evanston					508	190	308	208	240	102	475	232	372	578	82	517	600
Gillette						410	251	298	247	406	104	490	288	140	590	246	94
Jackson							383	285	163	177	385	391	447	552	320	459	505
Laramie								101	223	209	295	424	65	315	390	157	307
Rawlins									124	108	264	393	164	371	289	249	392
Riverton										142	214	250	286	373	321	295	342
Rock Springs											375	391	272	478	181	417	500
Sheridan												130	368	244	557	324	198

Source: Rand McNally (http://www.randmcnally.com/rmc/directions/dirGetMileageInput.jsp). Accessed on June 29, 2007.

Summary

Wyoming's population aged 65 and above is predicted to increase 67.8% by the year 2020. Presently Wyoming has five counties with no skilled nursing facility. In four of those five counties—Goshen, Johnson, Niobrara, and Platte—persons aged 65 and above make up 14%-20% of the population (state average is 11.31%).

Wyoming has 30 hospitals[22], 1 in-state referral region, 25 health clinics, 31 skilled nursing facilities, and 26 designated trauma centers. Nineteen counties have a primary care HPSA designation, 12 counties have a dental HPSA designation, and all 23 counties have mental health HPSA designations. The demographic shift of the aging population and influx of working age adults will quickly increase an already growing demand for health care.

The distribution of Ob/Gyn practitioners in Wyoming is sparse, with 11 counties experiencing a patient-to-population ratio of zero Ob/Gyn practitioners per 100,000 females aged 12-49 years. Nine counties have no emergency medical physician. More than half (n=12) of Wyoming's counties have no psychiatrist.

Wyoming's prehospital EMS system is heavily dependent on volunteers from the local community to fill staffing needs, with over 77% of all certified ambulance personnel classified as volunteer (non-paid) or part-time (compensated to some degree).

[22] Dartmouth Health Atlas, 2007 http://www.dartmouthatlas.org/data/finder.shtm Accessed on June 29, 2007

Special Analysis: Physician Origin and Medical Education

Methods

Dr. Robert Bowman of the University of Nebraska Medical Center has calculated the following statistics concerning the origins, education, and status of physicians practicing in Wyoming in 2005. His data source is the 2005 American Medical Association Masterfile of Wyoming residents graduating from medical school from 1987 to 1999. The American Medical Association Physician Masterfile data span the continuum from undergraduate medical education through practice, and comprise databases of 125 LCME-accredited medical schools; 7,900 ACGME-accredited graduate medical education programs and 1,600 teaching institutions; 820,000 physicians; and 19,000 medical group practices.

Findings

- Twenty-two percent of Wyoming medical students who attended Creighton University Medical School practice in a rural underserved area. Thirty-one percent of Wyoming medical students who did not attend Creighton Medical School practice in a rural underserved area. Thus, although Wyoming residents attending Creighton Medical School return to Wyoming at a rate of about 50%, less than half of those individuals practice in rural or underserved areas.
- Thirty-four percent of Wyoming physicians practice in major medical centers of 75+ physicians. Nationally, approximately 50% of physicians practice in a major medical center. This statistic does not measure relative physician shortage or surplus in nonmajor medical centers versus major medical centers. Thus, *Wyoming health planners should assess physician need by specialty and location and then design strategies to recruit and retain professionals for those areas.*
- A physician born in Wyoming is 20 times more likely to practice in Wyoming than is a non-Wyoming resident.
- Older medical school graduates were more likely to locate both in Wyoming and in Wyoming rural and underserved locations. In contrast, national trends suggest that younger graduates are more likely to locate in rural and underserved areas. Thus, *Wyoming medical student recruitment should not overlook older or "nontraditional" applicants.*
- Wyoming medical school residents who select the specialty family medicine are more likely to return to Wyoming. *Thus, Wyoming health planners should support efforts that encourage pre-med and medical students to select family medicine as a specialty.*

Special Analysis: Hospitalizations for Ambulatory Care Sensitive Conditions in Wyoming

Introduction

Inadequate access to care poses major challenges to the health of the public, social equity, and the economic viability of community health care systems. A useful approach for studying this problem is called ambulatory care sensitive conditions (ACSCs). ACSCs are defined as "conditions for which good outpatient care can potentially prevent the need for hospitalization, or for which early intervention can prevent complications or more severe disease."[23] ACSCs are medical problems that are potentially preventable and, with adequate and proper primary care, usually do not require hospitalization. They are often related to access to care in a community. This analysis will characterize the ACSC hospitalizations in Wyoming and identify areas/counties where barriers to access to care exist.

Methods

We analyzed Wyoming hospital discharge data in 2003 using an age-specific approach. We adopted the diagnosis and procedure codes for 20 of the ACSCs identified by the Institute of Medicine (IOM) in 1993.[24] The detailed diagnostic categories and their defining ICD-9 codes are shown in Appendix C. We used available information on patient characteristics (i.e., age, gender, race, and payer source) to compare the proportions of ACSC hospitalizations and non-ACSCs hospitalizations. We used four specific age groups (newborns, children, adults, and seniors) for county-level analyses.

Key Findings

- In 2003, there were 5,056 ACSC hospitalizations of Wyoming residents, with nearly 17,210 total patient days and associated total charges of almost $38 million.
- ACSC hospitalizations accounted for about 13% of all inpatient discharges and total hospital charges, and nearly 15% of total patient days.
- American Indians and blacks were more likely than whites to be hospitalized for ACSCs. Male patients were more likely than female to be hospitalized for ACSCs.
- The oldest elderly (80 years and older) and children (1–17 years) had the highest proportions hospitalized for ACSCs. Nearly 23% of Medicare patient admissions and 15% of uninsured patient admissions were for ACSCs.
- Some counties had higher proportions of ACSC hospitalizations.
    - For children aged 1–17 years, Johnson, Lincoln, and Washakie counties had the highest proportion of ACSC hospitalizations.

[23] Billings J, Zeitel L, Lukomnik J, Carey TS, Blank AE, & Newman L. (1993). Impact of socioeconomic status on hospital use in New York City. *Health Affairs, 12*, 162-173.
[24] Institute of Medicine, Committee on Monitoring Access to Personal Health Care Services, Millman M, ed. (1993). Access to health care in America. Washington, DC: National Academy Press.

- For adults aged 18-64 years, Weston, Hot Springs, and Crook counties had the highest proportion of ACSC hospitalizations.
- For seniors aged 65 years and older, Weston, Carbon, and Crook counties had the highest proportion of ACSC hospitalizations.

Other Findings

Table 1.2 presents the characteristics of patients hospitalized for ACSCs and compares the proportions between ACSC hospitalizations and non-ACSC hospitalizations by patient age, gender, race, and payer type.

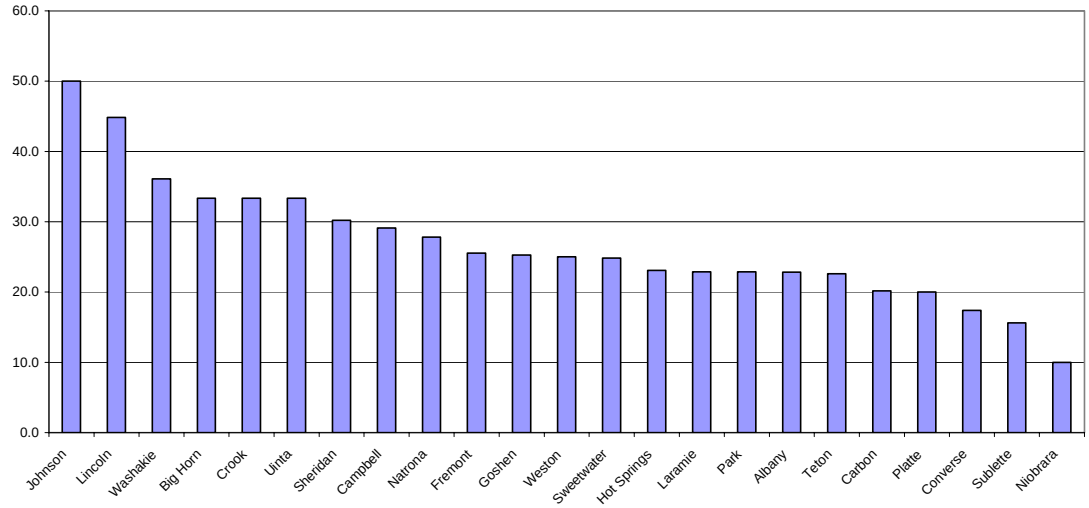
Table 1.2. Patient Characteristics Associated with ACSC Hospitalizations for Wyoming Residents, 2003

	Percentage of Total Discharges For Non-ACSCs	Percentage of Total Discharges For ACSCs
All	**87.32**	**12.68**
Age		
<1 year	96.90	3.10
0-17 years	74.05	25.95
18-44 years	93.73	6.27
45-64 years	85.43	14.57
65-79 years	79.36	20.64
80+ years	73.15	26.85
Gender		
Male	84.91	15.09
Female	88.85	11.15
Race		
American Indian	78.72	21.28
Asian/Pacific Islander	84.77	15.23
Black	79.67	20.33
White	87.94	12.06
Other	90.91	9.09
Payer		
Medicare	77.19	22.81
Uninsured	85.64	14.36
Commercial	90.80	9.20
Medicaid	91.87	8.13
Other	93.44	6.56

Source: Wyoming Hospital Discharge data set from the Wyoming Hospital Association, 2003.

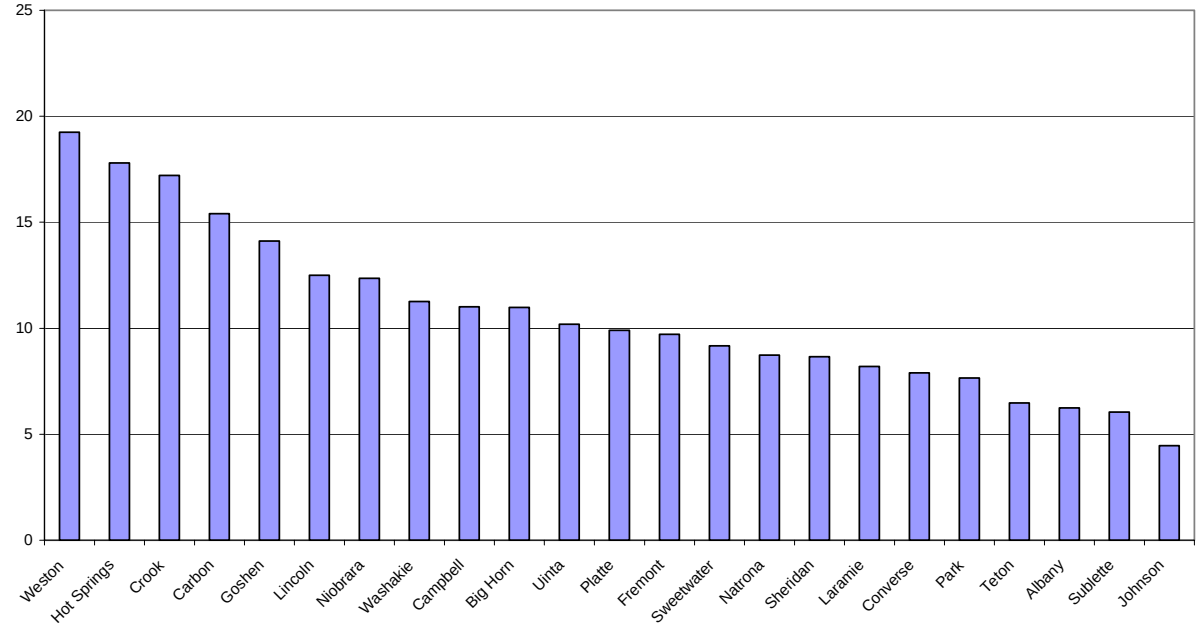
Figures 1.32. to 1.34 rank the proportion of ACSC hospitalizations by all counties in Wyoming for three age groups (children aged 1-17, adults, and seniors), respectively.

Figure 1.32. Proportion of ACSC Hospital Discharges by County, Children Aged 1–17 Years



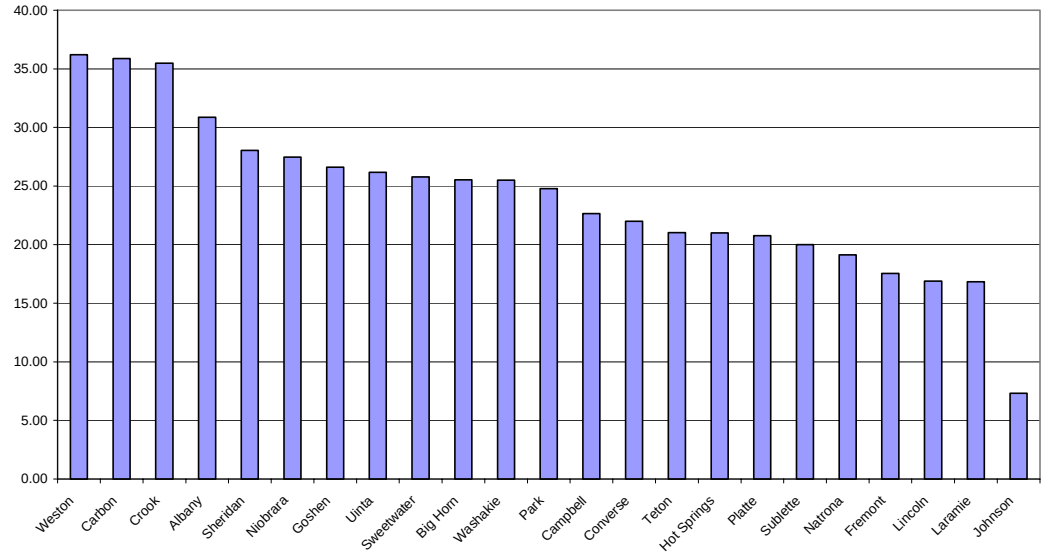
Source: Wyoming Hospital Discharge Data Set from the Wyoming Hospital Association, 2003.

Figure 1.33. Proportion of ACSC Hospital Discharges by County, Adults Aged 18–64 Years



Source: Wyoming Hospital Discharge Data Set from the Wyoming Hospital Association, 2003.

Figure 1.34. Proportion of ACSC Hospital Discharges by County, Seniors Aged 65 Years and Older



Source: Wyoming Hospital Discharge Data Set from the Wyoming Hospital Association, 2003.

Recommendations

1. We recommend that the proposed Wyoming Health Planning Commission convene focus group sessions with community leaders, public health officials, and primary care physicians in those counties identified as having the highest proportion of ACSC hospitalizations. The focus groups should be designed to investigate the potential problem areas and identify specific individual, socioeconomic, and systemic barriers to primary care access at local levels.

2. We recommend conducting more data analyses focusing on socioeconomic factors and investigating the patterns of change in ACSC hospitalizations.

Special Analysis: Vulnerable Communities In Wyoming

Introduction

Places are at risk of (vulnerable to) being without adequate health care services if they lack a sufficient number of people to support a practice or provider, they lack a sufficient number of people who are able to pay the full cost of care, or the population size and composition do not warrant the level of services available

Findings

- The majority of Wyoming's territory (over 66%) is classified as vulnerable for primary care due to low population density. The communities in those areas are thus considered vulnerable health service communities.
- The vulnerable communities model indicates that 19 health service communities in Wyoming are potentially vulnerable based on their demographic characteristics.
- Two health service communities are vulnerable by the model's principal components analysis.
- Six health service communities are statistically border-line vulnerable by principal components analysis.

Methods

The vulnerable communities information provided in this study is based on a methodology developed by the RUPRI Center for Rural Health Policy Analysis.[25] The common approach to assessing the relationship between available health services resources and areas to be served uses aggregations of counties, townships or single communities. The RUPRI Center's vulnerable communities methodology uses smaller geographic areas, aggregations of census block groups.

The vulnerable communities method requires us to manipulate geographic areas in several steps using two geographic information systems, ESRI's ArcGIS 9.1 (ESRI, Redlands, CA) and GeoLytics CensusCD 2000 (GeoLytics, East Brunswick, NJ). Census data at the block group level is collected and manipulated and the data is analyzed statistically using a principal components analysis. The block group is the smallest geographic unit for which the census provides detailed social and economic information about the population. Data for this analysis are from the 2000 Census STF-3 file, the most recent demographic data available nationwide.

[25] Mueller, K. J., Stoner, J. A., Shambaugh-Miller, M. D., Lucas, W. O., Pol, L. G. (2003). A method for identifying places in rural America at risk of not being able to support adequate health services. *Journal of Rural Health,19*(4), 450-60.

Because the focus of this study is on identifying rural areas that are vulnerable, all urban areas, including areas within 25 miles of the outskirts of urban areas,[26] would normally be excluded. However, we skipped this step in the model's methodology since Wyoming has no recognized urban areas. Therefore the entire state of Wyoming is the basis for further analysis.

The geographical starting point for this population-based analysis was all incorporated places[27] and census designated places[28] with a population of 3,500 or more persons. A 25-mile buffer was added to each of these places to encompass the sphere of influence of each. The result identifies 19 service areas in Wyoming, which we call "health service communities" (HSCs). The rationale underlying the choice of threshold is that a place of 3,500 can support at least one primary care physician. Using a 3,500-person minimum population is conservative for two reasons. First, the census-designated place is not the equivalent of the service area of any health care provider. Both the hospital service areas defined by the Dartmouth Health Atlas and the primary care service areas provided on the Bureau of Primary Health Care Web site encompass geographic areas larger than single places. Second, there are health care providers serving smaller places and showing positive operating margins, particularly in Western and Plains states.

These census designated places and incorporated places should not be confused with the health service communities or geographic service areas used in this model. The places we identified are community areas that are based on spatial adjacency, determined by using the federally recognized acceptable time and distance for travel for medical services as a guide.[29,30,31] This travel distance, a 25-mile buffer or sphere of influence, was designed to capture the population details of any block group whose centroid (geographic center) was within the buffer area.

By using census designated places and incorporated places as initial starting points, we were able to identify places where the population would be more than 3,500 persons. In fact, using census designated and incorporated places of 3,500 or more persons, the block groups that include them, and the areas they influence, we can identify places with considerable population, some in excess of 100,000 persons. Based on the literature, places with population ranging from 3,500 to

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[26] An urban area is a continuously built-up area with a population of 50,000 or more. It comprises one or more places—central place(s)—and the adjacent densely settled surrounding area—urban fringe—consisting of other places and nonplace territory *(Geographic Areas Reference Manual*, U.S. Department of Commerce, Economics and Statistics Administration, Bureau of the Census, 1994, P. 12-1). The urban area is not coterminous with the designation of a metropolitan statistical area MSA).

[27] A concentration of population; a place may or may not have legally prescribed limits, powers, or functions. This concentration of population must have a name, be locally recognized, and not be part of any other place. A place either is legally incorporated under the laws of its respective State, or a statistical equivalent that the Census Bureau treats as a census designated place (Geographic Areas Reference Manual, U.S. Department of Commerce, Economics and Statistics Administration, Bureau of the Census. 1994. P. 9-1).

[28] Census designated places are communities that lack separate governments but otherwise resemble incorporated places and are recognized by state government. They are settled population centers with a definite residential core, a relatively high population density, and a degree of local identity (Geographic Areas Reference Manual, U.S. Department of Commerce, Economics and Statistics Administration, Bureau of the Census. 1994. P. 9-20).

[29] Bosnac, E. et al. (1976). Geographic access to hospital care: A 30-minute travel time standard. *Medical Care, 14*(1), 616-624.

[30] U.S. Federal Register. (October 1, 2000). 42CFR5, Part 5 – Designation of Health Professional Shortage Areas, Part 1 Geographic Areas. U.S. Government Printing Office.

[31] Shannon, G. et al. (1979). Travel for primary care: Expectation and performance in a rural setting. *Journal of Community Health, 5*(2), 113-125.

100,000 are the most susceptible to demographic characteristic-driven influences on their ability to support health services; in other words, they are "vulnerable." Thus, these places form the focus of geographical areas we analyzed to identify those that are vulnerable. HSCs with 100,000 or more persons are expected to have a population base capable of supporting health services, whereas those below 3,500 persons would lack sufficient population to support a family physician.

Six demographic variables were used to describe the characteristics of the potentially vulnerable health service communities. These demographic variables were chosen because prior research has established their effect on access to care, utilization of services, and health insurance.

The percentage of persons age 65 and older was used to represent the likely dependence of that population on Medicare to pay for primary care services. Since there is very little penetration of Medicare managed care plans in rural areas, a high percentage of Medicare business implies accepting the Medicare payment schedules, which are below charges and, for many small rural hospitals, below operating costs.[32] Payment from Medicare may or may not generate positive operating margins. Many rural providers and analysts would argue that providers cannot maintain a business (be it physician practice or institutional provider) on Medicare margins alone.

Two measures of poverty, the percentage of the population with income below the federal poverty level (FPL) and the percentage of the population between 100% and 200% of the FPL,[33] were also used in modeling potential vulnerability. The percentage of the population with incomes below the FPL was selected to represent a combination of dependence on Medicaid and being uninsured.[34] For the children in this group, Medicaid should be the source of payment, while for the adults, payment comes from a combination of Medicaid, private insurance (quite likely with high deductibles), and out-of-pocket. The percentage of the population between 100% and 200% of the FPL represents those individuals most likely to be uninsured.

The percentage unemployed was used based on the expectation that it is a better representative of uninsurance than is Medicaid participation or qualification.[35] In addition, the percentage of individuals with less than a high school education among persons who are at least 25 years old was used as another surrogate for individuals most likely to be uninsured due their likely type of employment.[36]

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[32] Medicare Payment Advisory Commission. (2002). *Report to the Congress: Medicare Payment Policy.* Washington, D.C. U.S. Medicare Payment Advisory Commission.
[33] Schoen, C., & DesRoches, C. (1999). Uninsured and unstably insured: The importance of continuous insurance coverage. *Health Services Research, 35* (Pt. 2), 187-206.
[34] Davidoff, A. J., Garrett, A. B., Makuc, D. M., & Schirmer, M. (2000). Medicaid-eligible children who don't enroll: Health status, access to care, and implications for Medicaid enrollment. *Inquiry, 37*, 203-218.
[35] Swartz, K., Marcotte, J., & McBride, T. D. (1999). Personal characteristics and spells without insurance. *Inquiry, 30*, 6-21.
[36] Cunningham, P. J., & Ginsburg, P. B. (2001). What accounts for differences in insurance rates across communities? *Inquiry, 30*, 64-76.

Finally, the percentage of racial minority was selected to represent reduced service utilization and the increased probability of not having health insurance (Hargraves et al., 2001).[37]

Findings

The majority of Wyoming's territory (over 66%) is classified as vulnerable due to low population density. The remaining 34% of the state's area can be divided into 19 HSCs, denoted in dark gray on Figure 1.35. These 19 HSCs were further analyzed for their potential vulnerability due to their demographic makeup.

Of the 19 potentially vulnerable communities, only 2 (#11 and #17) are identified by the principal components analysis as true vulnerable communities (VCs). Both of these communities are located in north-central Fremont County, with most of the community's areas located on the Wind River Indian Reservation (one community reaches into the central portion of the county to include the community of Lander).

The high percentage of minorities in the communities (27.7% in #11 and 22.3% in #17) is the main factor in their designation as vulnerable. The second factor is unemployment, which is double the state average in both communities. Of the working age population in both communities, 9.68% in #11 and 9.2% in #17 are unemployed. The final factor in determining vulnerability is the percent of the population at or below 100% or 200% of the FPL. In communities #11 and #17, respectively, 19.03% and 18.15 % of persons have income less than 100% of the FPL, and 42.35% and 40.91% have income at or below 200% of the FPL.

When the HSC data is examined further, six communities (Figure 1.35 and Table 1.3) stand out as borderline (they are statistically very close to being identified as vulnerable). In a state like Wyoming, which is experiencing rapid demographic and economic change, even minor changes in any of the VC indices could cause a borderline community to become truly a vulnerable HSC.

Trend data at the county level for the borderline HSCs (Table 1.4) indicates that most of the VC indices are changing. Of particular concern is the marked decrease in total population in Platte and Washakie counties, the modest decrease in population in Big Horn and Goshen counties, and the only modest increase in Natrona County. Another concerning trend is the marked increase in the percent elderly population in three counties (over 150% in Laramie, Natrona and Park) and a less sharp but still significant increase in four other counties (between 54% and 81% in Big Horn, Goshen, Platte, and Washakie). In addition, there has been a substantial decrease in the percent working age population in Big Horn, Goshen, Natrona, Platte, and Washakie counties. A combined decrease in total population, increase in elderly population, and decrease in working age population, if continued, will increase the tax burden on the remaining population and eventually the state to provide needed public and private services. The increase in the percent of the population that is elderly will require a change in the type of health care services needed in these HSC's and will affect primary care providers due to the nature of Medicare reimbursements.

[37] Hargraves, J. L., Cunningham, P. J., & Hughes, R. G. (2001). Racial and ethnic differences in medical care in managed care plans. *Health Services Research, 36*, 853-868.

Figure 1.35. Vulnerable Health Service Communities

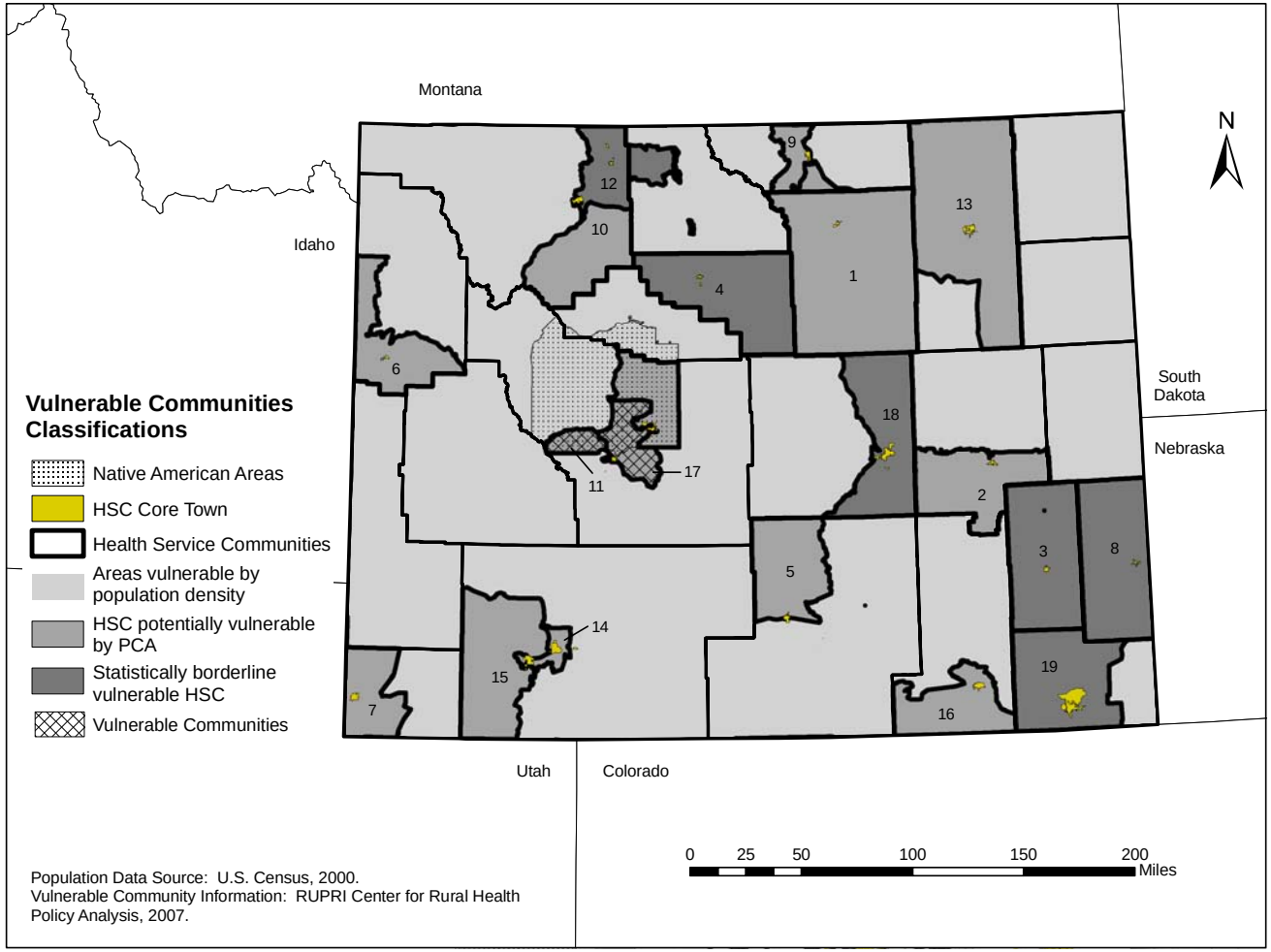


Table 1.3 Demographic Data for Potentially Vulnerable, Borderline Vulnerable, and Vulnerable Wyoming Health Service Communities

Health Service Community	County	VC Status	Total Pop	Percent Min Pop	Percent Pop 65+	Percent Pop 25+	Percent Pop No HS	Percent Pop of Working Age	Percent Pop in Work Force	Percent Pop Unemployed	Percent Pop Under 100% Poverty	Percent Pop Under 200% Poverty	Percent of Total Pop Checked for Poverty
1	Johnson	PVC	10,416	2.41	16.45	69.82	8.88	79.04	50.47	5.63	10.81	28.32	99.41
2	Converse	PVC	8,139	5.3	11.44	64.42	14.42	75.55	52.08	4.53	12.31	30.53	98.92
3	Platte	BVC	8,807	3.62	16.59	68.51	15.13	78.02	51.55	4.32	11.73	33.2	98.8
4	Washakie	BVC	9,422	8.8	16.68	66.91	14.45	77.31	50.54	8.48	13.64	31.79	96.85
5	Carbon	PVC	8,917	14.88	10.59	63.69	17.52	76.48	52.73	5.44	13.4	31.39	98.7
6	Teton	PVC	17,302	7.1	6.66	69.81	5.49	83.01	65.98	2.99	6.11	19.15	99.25
7	Uinta	PVC	15,668	6.87	7.45	57.72	14.78	70.65	50.41	6.38	10.81	30.03	97.4
8	Goshen	BVC	18,053	7.81	17.44	66.91	17.39	78.35	49.18	6.43	13.52	39.94	97
9	Sheridan	PVC	23,927	3.73	15.89	67.52	11.83	79.17	52.24	4.62	10.91	31.29	96.92
10	Park	PVC	22,401	3.42	15.61	65.65	13.1	78.62	50.28	4.96	13.49	32.79	96.5
11	Fremont	VC	23,234	27.27	13.21	63.09	16.11	75.14	47.96	9.68	19.03	42.35	97.53
12	Park and B	BVC	22,417	4.18	15.82	64.68	14.17	78.02	49.44	5.2	14.79	35.28	96.64
13	Campbell	PVC	32,078	5.05	5.08	59.59	11.77	72.87	55.69	4.5	7.69	22.32	99.16
14	Sweetwate	PVC	32,929	8.72	7.89	60.97	12.44	75.26	53.19	5.67	7.86	22.59	98.15
15	Sweetwate	PVC	35,910	8.87	8.15	61.18	12.65	75.46	53.08	5.74	7.72	22.38	98.14
16	Albany	PVC	30,936	8.61	8.05	52.47	6.37	84.05	56.96	5.44	21.24	41.4	92.36
17	Fremont	VC	29,871	22.23	12.9	63.65	15.25	75.65	49.38	9.2	18.15	40.91	97.43
18	Natrona	BVC	64,510	6.04	12.62	63.99	11.67	77.17	52.82	5.02	12.04	32.06	97.87
19	Laramie	BVC	78,456	11.42	11.31	65.03	10.81	77.48	51.32	4.64	9.03	27.43	95.54

Source: Original demographic data, U.S. Census, 2000. Vulnerable community designation, RUPRI Center for Rural Health Policy Analysis, 2007.
PCV: Potentially vulnerable health service community.
VC: Vulnerable health service community by RUPRI Center methodology.
BVC: Statistically borderline vulnerable health service community.

Six of the seven counties (all except Platte) have seen an increase in the percentage of their populations that are either of Hispanic origin or are racial minorities, another key factor in the VC formula. The most significant changes occurred in Goshen (153% Hispanic and 61.5% minority) and Park (181% Hispanic and 29% minority) counties. If the jobs available in these counties do not pay a living wage or include employer-provided insurance it is very likely that this population will create a particular burden for the primary care system in all six counties.

Table 1.4. Changes in Key Vulnerable Community Indices for Borderline HSC Counties in Wyoming

	Percent Change in Total Population 1980-2020	Change in Percent Working Age Population 1980-2020	Change in Percent Elderly Population 1980-2020	Change in Percent Hispanic Population 1980-2005	Change in Percent Racial Minority Population 1980-2005	Change in Percent Population Unemployed 1980-2000	Change in Percent in Poverty 1980-2000	Percent Population with H.S. Education 2000
Big Horn	(4.80)	(21.30)	56.40	57.10	85.10	62.90	5.60	83.20
Goshen	(3.70)	(20.00)	54.00	23.60	153.20	61.50	19.80	84.70
Laramie	30.00	10.60	160.80	40.40	68.20	(6.90)	31.00	89.10
Natrona	0.40	(20.80)	218.50	36.70	69.20	46.80	88.30	88.30
Park	32.90	9.10	165.90	38.90	181.40	29.70	81.30	87.60
Platte	(26.80)	(44.20)	79.60	(14.90)	(4.50)	(5.40)	(11.90)	84.90
Washakie	(21.00)	(37.50)	81.80	20.40	76.90	115.60	88.40	85.60

Sources: U.S. Department of Commerce, Bureau of the Census (http://www.census.gov/). 1980, 1990, 2000 Decennial Census Data and 2005 Population Estimates. 1980 data from GeoLytics, Inc., Census CD 1980 Short and Long Form; and Estimates, Projections, Consumer Expenditures and Profiles 2003/2008 (www.GeoLytics.com). 2005 data from Wyoming Economic Analysis Division (http://eadiv.state.wy.us), U.S. Department of Commerce, Bureau of the Census (http://www.census.gov/). 2009 projection data from Estimates, Projections, Consumer Expenditures and Profiles 2004/2009,GeoLytics, Inc. (www.GeoLytics.com), U.S. Department of Commerce, Bureau of the Census (http://www.census.gov/). 1980, 1990, and 2000 Decennial Census Data; Population Estimates and Forecasts for Wyoming, counties, cities, and towns for 2000-2020, taken Wyoming Department of Administration and Information, Economic Analysis Division http://eadiv.state.wy.us/demog_data/demographic.html.

Note: Hispanic Ethnicity includes: Mexican, Puerto Rican, Cuban and Hispanic Other.
Note: "Racial Minority" denotes racial minorities (any race) alone, not of Hispanic origin.
Note: parentheses indicate negative numbers.

By examining the trend data for unemployment and poverty, we find that the same six counties (Big Horn, Goshen, Laramie, Natrona, Park and Washakie) are in the midst of a trend that could easily cause one or more of the HSCs in these counties to become a vulnerable primary care payment area. This pattern, if continued, may indicate a future in which individuals lack the personal or employer-based insurance or personal health savings accounts that would provide financial security that a primary care provider would need. In addition, the increase in Medicaid usage would place an even larger burden on the state's safety net system and place a financial strain on hospitals due to possible increases in emergency rooms usage by the uninsured and an increase in uncompensated care for the poor.

Chapter 2. Workforce Recruitment and Retention

Key Findings

- Wyoming has an estimated shortage of 20 pharmacists in 2007.
- The University of Wyoming pharmacy program is studying a proposal to expand class size from 52 to 60 or 72.
- As of August 2006, 104 Wyoming students had entered the School of Medicine at the University of Washington through a regional education program, and 6 of the first 10 to complete residency training are practicing in Wyoming.
- The University of Wyoming social work program current enrollment includes 120 graduate students and 150 undergraduate students.

Methods

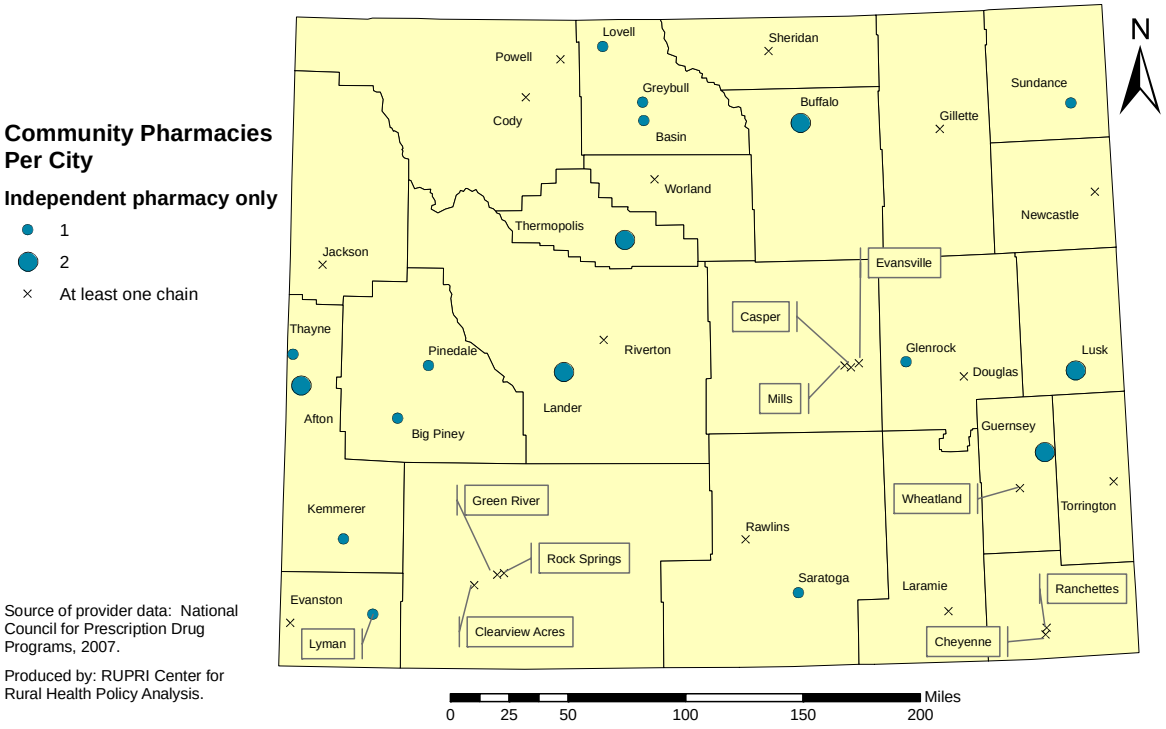
We interviewed six academic officers of the University of Wyoming in a one-day visit to the campus in August 2006. We interviewed individuals in pharmacy, nursing, medicine, student recruitment and retention, and telecommunications. The interview instrument was a series of eight general questions. During the interviews, we used a series of probes, varying the content of probes to match the particular program being explored (e.g., pharmacy, nursing, medicine, telehealth). Given the limited number of interviews and different knowledge base for each (from the different professions or special programs), we treated interviews as unique rather than creating a single integrated database. We wrote detailed interview notes for each interview, and those interview notes are the basis for our findings. The interviews were supplemented with data and descriptions from Web sites.

Needs, Programs, and Next Steps

Pharmacy

Wyoming is in the beginning stages of a shortage of pharmacists, estimated to be short about 20 pharmacists in 2007. The shortage is expected to be more acute as demand for medication increases as a function of baby boomers aging and developing chronic illnesses. Chain pharmacies are recruiting pharmacy graduates to prepare for the demand, which in turn is increasing the difficulty of keeping independent pharmacies staffed. Small community markets do not offer the salaries being offered by large chain stores, which are not present in all small communities. Without independent pharmacies, many rural communities would be unserved, and distances to the nearest chain pharmacy can be considerable, as shown in Figure 2.1.

Figure 2.1. Location of Community Pharmacies



The University of Wyoming pharmacy program is responding to the current and anticipated shortages by making education experiential, using sites in Wyoming. Students help staff the pharmacy, and because of the experience, they may be more likely to practice in Wyoming after they graduate. Increasing class size could also help, but only if a number of the students decide to practice in Wyoming, arresting and perhaps reversing the trend to leave for other states in the region. The pharmacy program is studying a proposal to expand class size from 52 to 60 or 72 by offering three laboratory sections of up to 24 students each. In the most recent year, there were 681 applicants; 140 were interviewed to select the 52 who entered the class, an increase from 48 students admitted in the past. The program is an exporter from Wyoming; fewer than 20 graduates stay in the state[38]. However, most stay in other states in the region, usually working for a chain pharmacy.

The pharmacy program has introduced new training approaches in recent years. Interdisciplinary programs have been initiated with nursing (a few joint classes and a shared residency experience, including students from medicine in sites in Cheyenne and Casper) and medicine (pharmacy students round with medical students in hospitals and make presentations to physicians). Pharmacy faculty are involved in teaching pharmacology in the nursing curriculum.

[38] data provided during interviews

The pharmacy program is considering ways to be responsive to the state's needs. Increasing class size is one way of doing that. The University of Wyoming is the principal source of new pharmacists for the state—approximately 70% of the practicing pharmacists in the state are graduates of this program. The school is also active in what may be the future for many in pharmacy, especially independent pharmacists—medication therapeutic management. By signing contracts with pharmacy benefit managers, local pharmacists can increase their earnings by managing the medications taken by their patients, pointing out to the patients and physicians when certain prescriptions may conflict with others and when other more cost-effective options are available. The school has started a firm to provide this service and offer students training experience.

Medicine

The average age of physicians in Wyoming is a concern for communities currently dependent on physicians who are nearing the age of retirement. While data indicate the current supply of primary care physicians in particular is adequate for a state with Wyoming's population, two concerns remain. First, the distribution of physicians can leave some communities short of the services they could otherwise support. Second, the population of the state is increasing rapidly, especially in certain areas. The supply of physicians may not keep pace in places with growing population. The challenge for physician training programs, then, is to generate sufficient supply in the specialties needed and to use programs encouraging practice location in places of greatest need.

Wyoming students who have been admitted to the School of Medicine at the University of Washington through the WWAMI (Washington, Wyoming, Alaska, Montana, Idaho) Regional Medical Education Program take their first year of medical school at the University of Wyoming. Wyoming's WWAMI program engages over 20 University of Wyoming faculty members in teaching first-year medical school classes to up to 16 medical students each year. Students from all WWAMI sites converge in Seattle for the second year of medical school. In the third and fourth years of medical school, WWAMI students are encouraged to select from clerkship training sites offered across the five-state region. Thus, Wyoming can attract its own and other WWAMI students back to Wyoming for third- and fourth-year clinical educational experiences in Wyoming communities, including Powell, Sheridan, Buffalo, Jackson, Rock Springs, Casper, and Cheyenne.

Wyoming WWAMI also works with the Wyoming Area Health Education Center (AHEC) to offer the popular Rural/Underserved Opportunities Training Program (R/UOP) as a four-week intense clinical experience for WWAMI medical students between their first and second year of medical school. R/UOP sites are spread across Wyoming and include several of the clinical training sites along with sites in other rural communities such as Kemmerer, Afton, Gillette, Douglas, Torrington, Lander, Riverton, and Pine Bluffs. Students who rotate through Wyoming communities learn that it is possible to practice medicine in rural locales and may be more likely to return to these settings when they complete residency training. From 1997 when Wyoming first joined the WWAMI program through August 2006, 104 students matriculated in the School of Medicine, 55 graduated with the MD degree, and 10 finished residency training. Already, 6 of

these first 10 Wyoming WWAMI contract students have returned to Wyoming to provide care for Wyoming citizens[39].

WWAMI and the AHEC also teamed to provide a seven-week summer high school enrichment program (U-DOC) for economically disadvantaged, rural, first generation (first in family to attend professional school), and minority students who aspired to careers in medicine, dentistry, and other health professions. U-DOC was offered first on the University of Wyoming campus from 1997 to 2004 and then moved to two Wyoming community colleges in Lander and Rock Springs for the summers of 2005 and 2006. Unfortunately, federal support for the popular program was cut in 2006, and insufficient local funds were identified to keep the program viable.

The Wyoming AHEC works closely with the Wyoming Health Resources Network to prepare, promote, and enhance the primary care workforce for Wyoming. Focus areas include mental health and health promotion/disease prevention. The Wyoming AHEC first received federal funding in 1995 and partners with numerous organizations to leverage its modest federal appropriation of approximately $60,000 each year[40]. At the University of Wyoming campus, Wyoming AHEC offers the SPARX (Student Providers Aspiring to Rural Experiences) course as an interdisciplinary one-credit course twice each year—as an upper level course in the fall and a lower level course in the spring. The SPARX courses, combined with the popular Community Health Advancement Program, give both undergraduate and professional students opportunities to learn and serve together in interdisciplinary groups[41].

Educators in Wyoming have anticipated the need for physicians in rural locations by establishing residency programs in family medicine in two communities—Casper and Cheyenne. The Cheyenne Family Practice Residency Program is community based and affiliated with the University of Wyoming. Medical students rotate within the Cheyenne Regional Medical Center. Required rotations include OB/GYN, general surgery, pediatrics, and intensive care. The Cheyenne program began in 1979 and since then has graduated 146 students[42]. The Casper Family Practice Residency Program is community based an administered by the University of Wyoming. Medical students rotate within the Wyoming Medical Center. Required rotations in Casper also include OB/GYN, general surgery, pediatrics, and intensive care. The Casper program began in 1977 and since then has graduated 188 students.[42]

Nursing

There are acute shortages of nurses in several rural hospitals and local health departments, on par with national shortages. Some graduates of programs in Wyoming are attracted to other states, for example to a magnet hospital (a designation by the American Nurses Credentialing Center to recognize health care organizations that provide nursing excellence) in Colorado. The University of Wyoming School of Nursing has adopted new programs designed to increase the number of

[39] Data from www.wyominghealthcarecommission.org/_powerpoints/Health%Commission%2011-20-6.ppt
[40] data provided during interviews
[41] Information from www.uwadmn.uwyo.edu/AHEC/activities/sparx.html
[42] American Academy of Family Physicians. Directory of Family Medicine Residency Programs. http://www.aafp.org/residencies/wy.html Accessed on June 12, 2007.

entry level and advanced practice nurses. There are three primary pathways to a nursing degree. The basic program admits college juniors into nursing school, taking 48 new students per year. An RN to BSN program is for RNs entering after completing an associate degree at a community college—38 graduated from this program in 2005[43]. In a special federally funded project, Western Wyoming and Central Community Colleges have been targeted for special recruitment and retention efforts for RNs and RN students, with expansion planned to Sheridan. An accelerated program is offered for people with at least a bachelor's degree in another discipline; the BSN can be completed in 16 months in classes taught as intensives (three credit hour courses taught in five weeks), with clinical rotations in rural hospitals. Nineteen students are in the first class in this program.

A master's program prepares nurse practitioners in primary care. Approximately 10 students per year are admitted to the program that can be completed by taking courses on-line, with one weekend per month spent on campus. The school has just begun a federally funded nurse practitioner program emphasizing psychiatric mental health nursing. In addition, the state provides $600,000 for student stipends.

Approximately 60% of the last graduating class from the basic BSN program obtained their first nursing license in Wyoming. With the demand being high for nurses, poor working environments are reasons to leave employment, for example leaving hospitals for public health agencies. Hospital leaders are aware of this and are working to improve working environments, with a goal of having at least one magnet hospital in Wyoming.

Social Work

The social work profession in Wyoming is critical to building and maintaining services to meet mental and behavioral health needs. The university may need to expanded its program if other ways of meeting community needs in mental and behavioral health are not found. The University of Wyoming has one of the longest-standing accredited bachelor's of social work programs in the nation, having started it in 1974. The master's of social work (MSW) program began with a class of 10 in 1997. The MSW program is specifically designed to meet the needs of Wyoming's dispersed population:

> Our advanced generalist program has a rural emphasis. Wyoming has low population density, and many small, distinct communities, each with their own economies. MSW-level social workers within Wyoming are often called upon to undertake many different functions within a social service agency, including micro level direct practice, community assessment and planning, and administration within the agency. Therefore, our program is designed to prepare students to practice in each of these areas. (Accessed April 14, 2007, at www.uwyo.edu/socialwork/mswfocus.)

The program currently admits 40 new students each year, and approximately 120 graduate students and 150 undergraduate students are currently enrolled. Admission is highly competitive

[43] data provided during interviews

(rejection rate of approximately 80%). Class size could be increased, but doing so would require additional faculty[44].

The University of Wyoming participates in the programs of the Western Interstate Commission for Higher Education (WICHE). Through WICHE, Wyoming students have access to training programs in other states and pay in-state tuition when doing so. The home states of the students support the tuition differential, in Wyoming with earmarked state dollars. States participating in this program have realized a high return on investment, with 70% to 80% of graduates returning to their home states for their professional careers. Programs of distinction attracting WICHE-supported students to Wyoming include the MSW and nursing degrees.

Summary

Recruiting and retaining health professionals will always be a challenge in Wyoming because of the small but dispersed population in the state. Developing educational programs in Wyoming is an essential strategy to respond to the need for health care professionals; people are much more likely to at least start their careers in areas where they grew up. The University of Wyoming has developed programs with that principle in mind, including graduate programs in social work, pharmacy, and nursing. Collaborations with two regional agencies generate training opportunities in medicine and behavioral health for Wyoming. Of special note are family practice residency programs in Casper and Cheyenne that are coordinated with the University of Washington regional medical education program. The foundation has been set in Wyoming to move toward a more systematic, planned program of focusing on interesting Wyoming youth in health professions careers and providing them special opportunities to obtain the training at low cost. Some additional elements of a comprehensive strategy may be needed, for example, science fairs for elementary school students. The state should consider establishing and continuously supporting a comprehensive approach to recruiting and training students in the health professions, emphasizing the benefits of locating practices in rural areas.

[44] data and conclusions provided during interviews

Chapter 3. Delivery System Redesign

Key Findings

- Stakeholders most commonly reported that inertia within key groups of statewide leaders is the major obstacle to changing the health care delivery system.
- Stakeholders believe that health care delivery is not a top priority for use of the state's public resources.
- Stakeholders believe that hospitals may be encouraged to change current practices as part of an initiative to retain patient business that might otherwise migrate to another state, provided doing so does not endanger collaborative efforts with hospitals in neighboring states.
- Stakeholders recommended a step-wise strategy of integrating services in local communities and then building regional systems.
- Stakeholders stated that use of electronic medical records and telemedicine is in very early stages in most of Wyoming.
- Stakeholders are doubtful that a centrally driven health information system can work.
- Stakeholders described a major health delivery investment made over the last three years to redesign community mental health services in Wyoming as an example of legislative support for regionalization.
- Stakeholders believe there is no pattern of sustained leadership in health care in Wyoming, but there are potential sources of leadership that can be explored.

Methods

This chapter uses the knowledge and judgment of stakeholders in Wyoming health care delivery to identify strategies for developing state-wide integrated systems of care. We interviewed statewide trade association representatives, state government officials, and other stakeholders to obtain further information about initiatives underway to improve health care delivery in rural areas and to discuss possible changes in policy. We constructed the sample of specific individuals in consultation with the WHCC (see Appendix D). The following subjects were explored in open-ended interviews averaging 60 minutes in length:

- Prospects for change, including issues that would challenge redesigning the system
- Health care service gaps in the state
- Sources of support for change, including any alliances among provider groups or specific providers
- Specific questions for particular program areas

We conducted 16 interviews in late 2006 and early 2007. We completed most interviews on-site; four were conducted by telephone. We entered all interview notes into a common database used in this analysis. The complete interview instrument is included in Appendix E.

Findings

Obstacles to Redesigning the System

Several stakeholders discussed a number of key obstacles. The most common obstacle reported is appropriately characterized as inertia, which includes several characteristics:

- Health care professionals reluctant to adopt new information technology or experiment with different payment methodologies
- Health care providers reluctant to form regional networks
- Service providers comfortable with current funding (grants) arrangements

One way to overcome inertia is for strong leaders to create pressure to support change. Stakeholders were less than optimistic that the current leaders in health care policy in Wyoming could overcome long-standing inertia. However, they held out hope that leadership could emerge (further discussion below).

Stakeholders stated that health care delivery is not the top priority for use of the state's public resources. Several stakeholders are hopeful that the legislature will commit new funding to meet current needs in health care delivery. State funds may be needed to fill holes left by reductions in federal funds, for example, grants for the U-DOC program[45] that were eliminated, or reductions in federal contributions to Medicaid.

Stakeholders described the continuing difficulty many residents have accessing services as another obstacle to any efforts to redesign the system. Access problems usually occur because a resident is uninsured or lives in an underserved area. The nature of the state—small, geographically dispersed communities—contributes to access problems. Securing providers is a challenge both because of small populations and because those populations include uninsured persons from whom providers will not receive full payment.

[45] U-DOC was a seven-week summer high school enrichment program for economically disadvantaged, rural, first generation (first in family to attend professional school), and minority students who aspired to careers in medicine, dentistry, and other health professions. U-DOC was offered first on the University of Wyoming campus from 1997 to 2004 and then moved to two Wyoming community colleges in Lander and Rock Springs for the summers of 2005 and 2006. Unfortunately, federal support for the popular program was cut in 2006, and insufficient local funds were identified to keep the program viable.

Gaps in the Health Care System

Nearly all stakeholders identified the lack of a consistent supply of providers in the state as the major gap in the health care system. Shortages arise in different professions at different times; the current shortage described most frequently was of mental health providers. The entire state is a federally designated shortage area for mental health, and two regions are especially short of mental health personnel: the northeast and the west[46]. Stakeholders are concerned because recruiting and retaining community mental health providers is especially difficult.

A second shortage stakeholders frequently mentioned was of obstetricians. Other physicians were said to be in short supply in some areas of the state, including a shortage of primary care physicians. Several stakeholders believed a shortage of dentists is looming because of the age of the current workforce. Stakeholders perceive that institutional health care providers and public health agencies are having difficulties filling all vacancies. These organizations are competing with attractive jobs in the booming economy of the state, from retail business as well as energy-related business.

Stakeholder perceptions that the supply of obstetricians is a special problem and that the distribution of primary care physicians is not ideal are consistent with the data presented in the first two chapters of this report. Maps of shortage areas support those conclusions as well as the shortage of mental health personnel.

Integrated Health Care Services, Regional Systems

Wyoming stakeholders described a health care delivery system that is highly fragmented, both across professions and across communities. Stakeholders reported examples of integrating services, primarily within some communities, and within some service lines.

Stakeholders spoke of some communities that have succeeded in integrating health care services through community service coordinating councils. These councils are opportunities for exchange of program information among public and private organizations delivering nonclinical services (e.g., home meals, home services related to activities of daily living). In one community, the local council conducted a community assessment that led it to develop a clinic for low-income families. Community councils present opportunities for additional integration, for example linking public health with acute care, and linking both to mental health services.

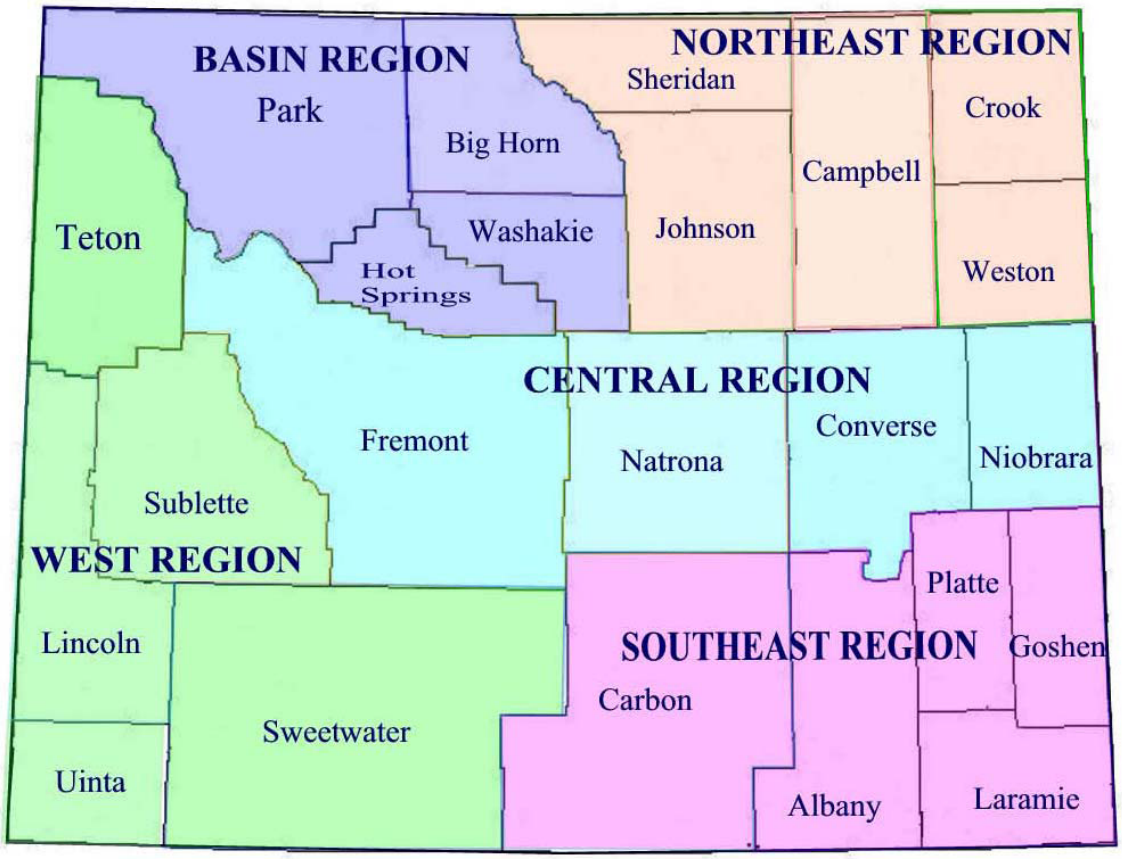
Stakeholders stated that integration of health care services is minimal and is limited to places in the state dominated by single health systems. However, they believe the climate for greater collaboration across providers in the state is favorable, particularly among the hospitals. Given distances between Wyoming communities, stakeholders told us that the small hospitals in the state, many of which are critical access hospitals (CAHs), do not usually compete with one another. Using federal resources available through the Medicare Rural Hospital Flexibility Grant program, the Office of Rural Health in Wyoming is working to foster increased network activity

[46] U.S. Department of Health and Human Services' Health Resources and Services Administration. 2007 Health Professional Shortage Areas. http://hpsafind.hrsa.gov/HPSASearch.aspx

among the CAHs. At present, though, stakeholders stated that there are very few formal programs or other linkages between CAHs and the larger tertiary care hospitals in the state. Some of that apparent gap may not actually be a gap. Several stakeholders pointed out that most of Wyoming's population is near the border of another state, and Wyoming CAHs may have relationships with larger hospitals in bordering states (e.g., with Billings, Montana; Fort Collins, Colorado; or Scottsbluff, Nebraska). Wyoming hospitals may be encouraged to engage in more collaboration as part of an initiative to reduce loss of hospital business to neighboring states, although doing so could threaten relationships Wyoming border hospitals have with tertiary hospitals in neighboring states.

There have been limited efforts to think in terms of regional service delivery. Stakeholders consistently described a delivery system that is focused on one community at a time. During the past three years, though, the legislature has funded the development of regions for delivering mental health services. Five regions were set up by legislative statute to engage in planning for mental health services (See Figure 3.1). Regions are to focus on emergency response, crisis response teams, and moderate to intensive residential care. Approximately $20 million has been invested by the state in this move to regional planning and service delivery.

Figure 3.1. Wyoming's Mental Health Comprehensive Care Regions



Source: Wyoming Mental Health and Substance Abuse Divisions – Mental Health Gaps Analysis Report 2006, http://wdh.state.wy.us/Media.aspx?mediaId=922.

In looking to the future, several stakeholders described a scenario in which local entities would integrate services and from that base work toward regional integration. This approach could build on the success of community councils and community initiatives.

Use of Technology

The Wyoming Department of Health launched a telehealth initiative in 2004—WyNETTE, the Wyoming Network for Telehealth. As of April 2007, the network has implemented small projects, using an initial $1.5 million from the U.S. Department of Health and Human Services. These projects may lead to further developments. The university has worked with others in the state, including the WHCC and the Wyoming Department of Health, to form the Wyoming Regional Health Information Organization (WyRHIO), a statewide regional health information organization, but as of this time there is little activity to implement a statewide system. Availability and use of high speed connections for communication is uneven across the state.

Every stakeholder interviewed stated that use of technology for purposes other than diagnosis and treatment was, at best, just beginning in Wyoming. Discussions with the stakeholders interviewed for this report centered around two particular uses of technology, information technology such as electronic medical records, and telehealth. Neither of those applications is at an advanced stage in Wyoming.

Providers in Wyoming, according to the stakeholders we interviewed (which included officials from organizations representing providers), have been slow to adopt new information technology. Stakeholders said that the front-end costs of new information systems is a barrier to further adoption, particularly for those practices comfortable with current information systems. WyRHIO was created to encourage adoption of electronic systems and linking those systems with each other. However, it has not had an impact yet on individual practices in small rural communities. Health information systems are not being used to transmit prescriptions, and they are not used to double check written prescriptions for potential errors. Some physician practices are using electronic health records, but most are not. Two stakeholders described value in helping small independent providers navigate the marketplace to choose appropriate vendors and products. Providers are currently frustrated with the number of vendors on the market and no clear distinctions among them, including knowing which ones have staying power. WyRHIO appears to be a top-down model for achieving connectivity across all providers in the state, but stakeholders are doubtful that a centrally driven system would work. They favor a model based on local buy-in. WyRHIO demonstrations may achieve that objective, but at the time of the interviews, results were not yet known. One stakeholder suggested a need for strong leadership to accomplish goals related to adopting new information technology, a theme (leadership) that is repeated in other matters.

Wyoming providers are making little if any use of telehealth networks. A chief executive officer has been hired for WyRHIO, which may create momentum for both information technology and telehealth. However, inertia will need to be overcome. Stakeholders said there is little interest in telehealth at this time from physicians, hospital leaders, or state government. Discussions are underway regarding the use of telehealth for psychiatric services. While stakeholders recognize

the appeal of telehealth in a sparsely populated state such as Wyoming, they see no discernable momentum to move with any speed to adopt such systems.

Making Strategic Investments

Wyoming stakeholders interviewed for this report provided examples of programs in which investments have already been made and ideas for further strategic investment. As the legislature and others consider use of resources generated by the current economic boom in Wyoming, the following are possibilities.

A major investment has been made to redesign community mental health services in Wyoming. Historically, mental health services were provided through a state hospital, which was plagued with a backlog of patients and released an unacceptable percent of inpatients into communities where no support services were available. The legislature allocated more than $20 million to build five mental health regions in the state, and to create a system that permitted residents to go anywhere in the state for any service. Regional services will include emergency response, crisis response teams, moderate to intensive residential services, and one pilot site for acute care. The change is underway, and among the unanswered questions are the following:

- Will community-based services be sufficient?
- Will hospitals providing up to three beds for psychiatric care be able to maintain high quality services?
- Will crisis response teams be effective?

Another new program in behavioral health, funded by a $9 million, six-year federal grant, is developing systems of care targeted for youth with drug problems. A request for funding from the state was denied.

The Wyoming Department of Health implemented an innovative program to serve children with developmental disabilities, including a developmental preschool program in 14 regions, a project of the Office of Special Education in partnership with the Developmental Disabilities Division. Children are identified at an early age as needing the service and after being in the program are able to attend school.

Efforts are underway between the Wyoming Department of Health and the School of Pharmacy at the University of Wyoming to develop programs to help sustain local pharmacy services. These efforts include the first state-funded program to pay for pharmacy consultation in Medicaid. With this program, information is provided to pharmacists so that they can review the prescribing patterns of physicians. Recommendations to substitute less expensive, therapeutically equivalent medications are furnished to the submitting primary care physician. Thus far, the program is showing net savings in drug costs of $125 per month per patient after a $125 fee paid to the pharmacist[47].

[47] data provided during an interview

Beyond the programs already in place, stakeholders provided suggestions for other investments:

- Create a pharmacy residency program that encourages rural practice and provides some relief for current rural pharmacists.
- Provide resources to implement a legislature-approved process of nursing home donations of unused (after a resident dies) unit dose medications for distribution to low-income working poor.
- Establish a state resource to help providers evaluate vendors of health information technology and connectivity across different systems (interoperability).
- Create long-term infrastructure improvements (e.g., renovation or replacement of facilities) in local health care services.
- Make appropriate use of nearby places in neighboring states to develop systems of care.
- Develop a long-term plan for health care delivery in Wyoming.
- Utilize the Flex Grant program and the presence of CAHs to create networks of care.
- Set up a state trust fund to pay insurance premiums for high-cost individuals so others in groups can obtain lower private insurance rates.
- Centralize specialized trauma care.
- Place a greater emphasis on prevention and health promotion, including for the elderly population.
- Establish a case management program for high-risk populations, including nurse home visitation and nurse-family partnership for the elderly and disabled.
- Extend the term of the Wyoming Healthcare Commission.
- Initiate chronic care management programs.
- Help health care providers adapt to competition based on quality and service as a way to stem out-migration.

Leadership

When asked about leadership in health care issues in Wyoming, stakeholders provided three characterizations. First, a few key individuals and organizations currently set the agenda for health policy in the state. Second, in general, health care issues are not high priority items in the state, and there is no sustained leadership to carry out long-term ideas. Third, there are pathways to improve leadership for the state.

The current leaders identified by the stakeholders come from the legislative and executive branches of state government and from leading professional associations. Specifically identified as current leaders were the following: the governor (now in his second term), the chair of the Senate Health Committee (Senator Scott), the head of the Department of Health, associations

representing the health providers in the state (hospitals, physicians, and nursing homes), and advocacy groups for certain issues, such as mental health.

Several stakeholders, when asked about obstacles to any effort to redesign the system, identified a lack of committed leadership. They see the leaders identified above as narrowly focused on current issues and not on broader strategic thinking or system change. As one person framed the challenge, current leaders may be focused on sustaining basic services and cannot devote their attention to broader issues unless and until that base is secured. Other stakeholders acknowledged that constraint but argued that the actions to secure the base should be consistent with a longer-term strategic approach.

The stakeholders presented some pathways to long-term leadership. Several stakeholders described the legislature as including new representatives with interest in health care issues who could become a nucleus of future leadership. Stakeholders described the leadership in the Department of Health as another source of long-term leadership. Several stakeholders implied that professional associations would be more proactive about systemic change if association members communicated support for change. At least two stakeholders identified the WHCC as a current source of new ideas and suggested that a continuing commission could develop a long-term strategy and monitor progress toward achieving long-term goals.

Summary

A major challenge for the future of health care in Wyoming is to overcome inertia among the stakeholders. Bold, creative initiatives that engage those stakeholders in designing new approaches could motivate action, especially if they are seen as being responsive to the needs of the stakeholders. Service delivery regions for mental health have been developed. Planning regions designed for all services are another way of creating areas within which systems could be developed. Another possibility is to follow boundaries of hospital or primary care service areas, following natural market regions that cross state boundaries. Leaders in Wyoming could use those boundaries to recognize and take advantage of patient flow into the state as well as natural migration to other states. Diffusion of new information technology and telemedicine has been slow in Wyoming. However, if recognized as a means to an end, and if the end is supported by engaged providers, new technology would be an instrument for integrating services and effectively closing some service gaps with telemedicine. Leadership in health care needs to be nurtured in Wyoming. The recent transition in the Wyoming legislature creates an opportunity for that to happen.

Chapter 4. Community Case Studies

Key Findings

- While several persons expressed concern about Wyoming's historical boom and bust economy based largely on energy or agriculture, it was also clear that those who feel their community has a more diverse economy are more likely to focus on recruiting new business.
- Residents commented that informal leaders significantly affect local decision-making, especially when considering how to approach community change and needs.
- Community members donating to the local hospital foundation or serving as hospital board members were the only significant forms of community impact on local health care that surfaced during interviews.
- Community members did not identify tangible connections between health care providers and community leaders.
- Community members expressed concern about continuous population growth combined with the number of providers reaching retirement, and stressed the importance of recruitment and retention efforts.
- Respondents expressed concern about the shortage of mental health services in their communities.
- Respondents identified services for the elderly as a current or future need, particularly assisted living.
- Interviewees stated that the travel required to receive specialty care can be a barrier to access, especially during the winter months.

Methods

To gain a complete understanding of how the health care sector relates to the quality of life in rural communities, and to understand the dynamics of how health care system change might be implemented locally in Wyoming, we completed an in-depth study of two Wyoming communities, Powell and Rawlins. Based on suggestions from the WHCC, the two sites were selected to provide variety in geographic location and on some measures of population, economic, and health characteristics.

RUPRI Center staff adapted interview questions for this study based on the Social Capital Assessment Tool[48] (See Appendix F). Site visit methodology, including the interview questions, was pilot tested in a rural community in Nebraska. Investigators traveled to southeast Nebraska and spent one day in the field to thoroughly test the methods and to practice the interview questions.

[48] World Bank Group. Social Capital Assessment Tool. Available at http://www.irisprojects.umd.edu/socat/tools/tools.htm.

From the interviews with local community members we aimed to accomplish the following:

- Explore the unique economic environment and business development of each community.
- Assess social capital and institutional networks to understand the social-cultural context of each community.
- Examine the capacity of public sector resources and social services within each community.
- Develop an understanding of existing and potential links between health care delivery and other sectors (e.g., education, economic development, transportation) and how each is affected by decisions made in other sectors.
- Obtain community members' perceptions of local public health problems.
- Understand how community members perceive problems or needs of health care systems with regard to accessibility, quality, and adequacy of care .

Four RUPRI Center staff investigators spent three days at each location in Wyoming conducting a total of 51 interviews with local stakeholders (from the health care, civic leadership, and business leadership sectors, and others nominated by Commissioners or local informants). Site visits were conducted between November 6 and 17, 2006.

RUPRI Center staff investigators identified key themes during daily debriefing sessions while in the field. Upon return to UNMC, data from all interviews were converted into documents that could be analyzed qualitatively using NVivo software. Investigators coded all interview data based on the key themes identified in the field. For consistency, the investigative team reached consensus on detailed definitions of each theme and stored the definitions in a shared document. To increase validity, at least two investigators coded each interview.

Findings

Local Economy

Community members were asked about their perception of the local economic structure, business development, jobs and workforce, and long-term financial outlook of their communities. Major findings regarding the local perception of the economy follow.

Local economies in both communities are based on either energy or agriculture. Regardless of the makeup of the local economy, local residents in both communities said that the local economy should be diversified (e.g., it should include a mix of retail, tourism, agriculture, manufacturing) to ensure a strong economic base and sustain long-term economic growth. In the community where the local economy is energy-based, community members were more likely to express concern over the effects of the boom-bust cycles on the local and surrounding business and job markets. But in the community where the local economy is comparatively diversified or steps are being taken toward diversification, community members were more likely to express

concern about problems in recruiting new businesses and maintaining aesthetics. The following statements represent what we heard about the local economy and the need for diversification:

> "[We need to] find another type of resource to build upon. We are an energy community here and we rely heavily on energy, coal, gas, natural gas, oil, and of course you have the railroad. But until we find other avenues to create jobs and we're not so dependent on the energy industry, we won't see the boom and bust cycle end, we will not see steady growth or continued growth."

> "We had the pipeline come through here just recently. There's an economic boom, and of course the prison is a mainstay in the economy. If the economy should go south, the prison is going to be here regardless. You know, that's it. I don't think there's a lot else."

> "[The local economy] is doing well right now. I think it depends a lot on whether we can keep the downtown vibrant. We are in an area that's not too far from natural gas developments . . . and I think that draws workers and creates jobs in town. But I think that our town will be affected very negatively if the minerals market deteriorates."

Unsuccessful business recruitment was among the highest concerns of both communities. Community members focused on the lack of local retail businesses when discussing business recruitment. The presence of a single grocery store in one community exemplifies the insufficiency of local retail businesses. As a result, many of those interviewed explained that it is not uncommon for people to travel outside of the community to purchase bulk items and other merchandise that may not be available locally. Many felt that making business recruitment and retention the focal point of economic development plans would help alleviate some of the problems associated with commercial revenue that leaves the community. Community residents expressed mixed feelings about chain businesses entering the community. Some welcomed the convenience and job opportunities a large business can bring into the community, while others were concerned about the negative impact that chain businesses can have on small retail businesses.

Beyond business recruitment, community members indicated that recruiting and retaining young professionals is a challenge for local economic development. Although high-paying blue collar jobs in the energy sector have helped, community members commented that the lack of more diverse opportunities hinders recruitment and retention of young residents. As one interviewee stated, "There are a lot of young residents here, but you basically have farming, the oil patch, or a family business, and if they don't fit in one of those three categories, most of them have left. There's not enough employment to support them."

In addition, there is a strong perception that there are housing shortages for newcomers who do not qualify for low-income housing. Furthermore, those interviewed commented that boom-bust cycles of the economy make it much more difficult to plan for housing projects over the long-term. The following statements represent what we heard about local housing supply:

> "We're short on housing for newcomers because of the influx of people that are here now. And I think a lot of them are living in probably substandard housing."

> "Affordable housing is one of our major challenges right now."

Social-Cultural Context

To assess the social-cultural context of local communities, community members were asked about their perceptions of trust, cultural diversity, population changes, informal and formal leadership, the local decision-making process, the dynamics of institutional networks, and community development efforts.

Most of the community members believe that there is a high level of trust within their local communities. Descriptions of "close-knit," "hard-working," and "blue-collar" people were among the most common community characteristics mentioned. Community members in general welcome a diverse culture. However, respondents distinguished between Hispanic permanent residents, whom they trust, and migrant workers, whom they distrust. Some noted that the transitory nature of migratory work makes it difficult to establish long-term relationships with migrant workers and contributes to a feeling of distrust. The following statement represents what we heard about the Hispanic population:

> "I think that our county is like 16% Hispanic. But these are 'old time' Hispanics. Then there are some other ones who come up here—a lot of those illegals. The husbands work in the housing trades or they're carpenters or they work in the fields too. You know, those are the people who work in the growth industry. But I think the community's very used to having a Hispanic culture."

Community population continues to increase, with persons older than age 65 accounting for an increasingly larger percentage. Some population increases occur as a result of young migrant workers in the energy sector or seasonal workers in agriculture. Community members suggested that much of the population increase is occurring because desirable community characteristics have attracted retirees to the community from other parts of the country.

Residents commented that local communities are significantly affected by informal leadership, especially when considering how to approach community change and needs. Notably, many informal leaders have a prominent position in the community, such as a hospital board member, newspaper editor, banker, city council member, or physician. When considering community involvement within the context of informal leadership, local residents are more likely to participate in the decision-making process when the foci of discussions are business recruitment and recreational opportunities. However, residents in one community commented that collective action in local issues overall is low. Specifically, many noted that there is little to no philanthropy present within the community, while others noted that it has been hard to get people to attend community activities.

Collaboration and networking between institutions (e.g., banks, businesses, government) often facilitate identification of local problem areas and development of solutions to those problems. A common example of this collaboration is the role of banks and government in supporting business development. Community organizations (e.g., clubs, groups, faith-based organizations) were also often cited as platforms for facilitating local change, but organizations were less commonly mentioned in terms of involvement in local economic or political issues.

Community members identified hospital administrators and physicians as local health care leaders but believe that they are only involved in community affairs that are health care-related. Although many respondents agreed that local health care providers have a strong presence in their community as individuals, health care organizations are not commonly seen as active in the community. Likewise, community members are not often involved in formal discussions about local health care. Annual health fairs sponsored by local health care providers were among the few examples of health care organizations providing a venue for organized discussions about health care within communities. When asked whether health care organizations are involved in community discussions in any way, a common response was, “Not much. No.”

The only significant form of community impact on local health care that surfaced during interviews was in reference to community members donating to the local hospital foundation or serving as hospital board members. Overall, interviewees made few in-depth comments about specific links between local health care and other sectors within the community, which could mean community members are not aware of the interconnectedness between the health care sector and other sectors of the local economy. The following quote describes the attitude many community members have toward their local health care system: “Certain segments of the community react when changes in the health care system affect them, otherwise interest is not taken.”

Social Services and Public Infrastructure

To examine the current capacity of public sector resources and social services, we asked community members about their perceptions of educational and day care programs and services; water, electricity, and communication capacities; and local police and judicial systems.

Most community members were satisfied with local police and judicial systems and consider their communities safe places. Many commented that they do not lock their cars, indicating feelings of safety in the community, a consistent theme among interviewees. In contrast to feelings of safety, however, many community members noted that police officers are constantly being recruited, which some noted is due to the competitive wages in the energy sector combined with the high rates of methamphetamine abuse in and around local communities. As one interviewee stated, “[Police are] very good. We have a hard time keeping police because of competition with gas and oil wages, so we constantly have to hire new [officers].”

Social services and programs are available but sometimes limited. In both communities, residents expressed an overall satisfaction with education and the public infrastructure such as water, electricity, and communications. The few concerns that were raised regarding education were

specific to middle school education and inadequacy of day care quality and supply. Interviewees told us that the lack of adequate day care is a significant problem, especially in areas experiencing an influx of young (usually blue-collar) workers with young families. In some cases, the lack of adequate day care is compounded because day care business hours do not match the needs of those who do shift work. The following statements represent what we heard about day care:

> "For people who want to work, we don't have sufficient day care—that's an issue."

> "A law was passed in March that deals with quality day care, and it looks not only at availability but also ways to improve the quality so that children get better care. And the general finding throughout the state is that day care is costly for parents, but what parents can afford isn't enough to really help pay for quality. And so there are limited slots, especially for children under two and for infants. It's a real concerning issue."

Perceived Health Problems

Community members were asked about their perceptions regarding principal local health problems. The most common problems identified were substance and alcohol abuse, obesity, teenage pregnancies, cancer, and diabetes.

Substance abuse was consistently acknowledged in both communities as a prominent health concern. Specifically, the use of and addiction to methamphetamine were frequently mentioned as health risks and perceived as growing problems. Meeting the mental health needs of methamphetamine users was also seen as a key area needing improvement throughout Wyoming. Similarly, community members commonly cited alcohol abuse among the local young adult, working population as a health hazard, especially in relation to drunk driving. Methamphetamine and alcohol abuse were frequently mentioned in discussions about mental health and the ongoing need to recruit for local police. The following represent what we heard about substance abuse and the need for mental health services:

> "Everybody knows everybody, and if you're kind of new to the community, some people are kind of wary. Especially if you're younger, I'd say 20s, because people are really afraid of the meth problems we have around here. They don't want to be involved with people who are involved with that."

> "We are so in need of adequate mental health services. We have meth in this community and it is a major problem."

Obesity was commonly identified as an increasing public health risk. Many suggested that an unhealthy sedentary life style is common in local communities. Community members believe that the lack of community facilities where people can participate in regular physical activity is one of the biggest lifestyle barriers of the local culture. When asked what are the community's

three principal health problems, one interviewee stated, “Methamphetamine use, alcohol abuse, and sedentary lifestyles. [The third] is counterintuitive, but sedentary lifestyle and obesity are rural problems.”

Interviewees in both communities view teen pregnancy rates as a prominent issue. Specifically, some community members believe teen pregnancy rates are increasing, and as a result, see a potential problem because health programs and education to reduce risk factors associated with the teen pregnancy are limited.

Many community members mentioned cancer and diabetes as the two most common health issues. The interviewees were particularly concerned with environmental factors that may be associated with high incidences of cancer in Wyoming.

Health Care System Issues

We asked community members about their perceptions of local health care systems with regard to resources, accessibility, quality of care, and coordination of care. The major health care system concerns can be categorized as follows:

Insufficient Health Care Workforce. The most commonly cited problem with local health care systems is the shortage of health care professionals. Shortages of primary care physicians, mental health professionals, specialists, and allied health professionals coupled with a growing number of physicians and nurses reaching retirement were identified as major challenges by most community members. For example, some female residents indicated that the lack of obstetricians/gynecologists in the area forced them to have their children delivered by doctors in other cities or other states. Within the context of recent population growth, it was apparent that recruitment and retention of health care professionals is rising to the top of community residents’ concerns. Community members are worried that no formal recruitment activities are taking place. The following statements represent what we heard about the health care workforce shortage:

> “With health care, I would say our principal problem is getting enough trained people to provide care services.”
>
> “We go for years without a psychiatrist. We have one psychiatrist right now and we’re hoping to get another one because, actually, we found that one psychiatrist cannot exist here. There is too much pressure. They are gone in a year or two. So we are trying to get two in the county.”

Health Care Service Line Gaps. Gaps exist in several core health services in rural Wyoming, including mental health services, elder care, dental care, and emergency medical services. Mental health services were frequently mentioned as areas where services are lacking. Limited outpatient psychiatric treatment is available locally or within short driving distance. However, both local health care professionals and community residents noted a desperate shortage of

nearby inpatient psychiatric services, especially for patients with dual diagnosis (psychosis and substance abuse). These patients are often hospitalized locally for a prolonged time while awaiting placement. Local primary care physicians have to take care of patients with severe mental illness while feeling frustrated by not being able to provide appropriate psychiatric care for them. The following represents what we heard about mental health services:

> "Our biggest challenge right now is if there is an inpatient or a patient that comes to our ER [who needs inpatient mental health care], now we're looking for a bed 'cause there aren't any. There is a private facility in Casper, four hours away, and there is a state hospital in Evanston, which is six hours away."

> "It's a huge problem when someone is suicidal or has psychiatric issues, so we have to admit them. Then we have to put them in the average patient room but supervise them one-on-one. Dr. XX one day said, after he was with the patient on suicide watch the night before, 'Even if he [the patient] didn't try to commit suicide, I needed to be there. The patient pulled a knife out of his pocket last night.' . . . And there are all kinds of things [the patient] could do, like hang something on the hooks [to hang himself]. . . . We don't have the skills we need even if we make a psychiatric room or a room that's safe. . . . We are not properly staffed for that. A lot of times we get stuck with the psychiatric patients for two weeks before we can get them somewhere because Evanston is full or they can't take them."

Despite the existence of some long-term care options, many community members are concerned about sustainable delivery of elder care. Recognizing the aging of the population, interviewees expressed concern about meeting elder care needs, ranging from home care and long-term care to increased local transportation accessibility. Nursing homes in both communities are full, with long waiting lists. State certificate of need regulations do not consider geographic mal-distribution of long-term care beds. Assisted living facilities are needed as the population continues to age, sparking increased concern about the future of elder care. Home health services are underfunded and understaffed, with only one home health nurse for one of the communities. The following statements represent what we heard about elder care:

> "We have significant waiting lists for assisted living and for long-term care."

> "I have a home care agency that is dying. Not because the need isn't out there but because reimbursement is so poor and I can't attract people to work in home care."

With respect to emergency medical services, community members' primary concern is the large volunteer-based workforce that staffs most services across the state. Some areas have difficulty recruiting enough volunteers while in the boom of the boom-bust cycle, because potential volunteers are likely to be employed by energy companies and not available to staff emergency medical services. Community members also suggested that coordination between hospitals, local sheriffs, and fire departments is a necessary condition for successful emergency medical services.

Lack of Health Information Technology (HIT). Despite evidence that Wyoming is well-equipped for technology development in some areas, community members emphasized the need for improved HIT connectivity and a general increase in IT use. Insufficient HIT can be a barrier to implementing standardized quality measures and programs to monitor quality of care. Because the community is deficient in IT support necessary to establish a standard electronic system, some physicians have taken the initiative to build a diabetes registry system using paper-based systems as a start toward improving quality.

Community members' responses to questions about health care quality are not based on hard data. Health care quality information is communicated via hearsay and does not reflect the use of real quality measures. A local hospital Web site has minimal quality information about health care providers. The health care providers who we interviewed reported that the public is not interested in quality data, but the hospital in one community has started the process of quality reporting by educating its board regarding quality information. The following statements represent what we heard about quality information:

> "I wonder if the community can access quality information. I don't think that the CMS Web site and all those things make any difference to the community."
>
> Q: "How often do people ask about quality information or make decisions based on quality information?"
> A: "By word of mouth. Sense is that quality is good here. People stay here for health care, for the most part."

Financial Access to Health Care. Employees of small companies and people with preexisting health conditions face prohibitively high health insurance premiums and often choose not to buy insurance coverage. Respondents also reported that prohibitively high dental care cost creates barriers for many people, especially for people with minimal or no coverage. Local physicians commonly mentioned that the ER is used as a last resort for low-income people who need medical care. Many community members commented that the ER was used as a primary care resource for seasonal-migrant workers for whom insurance is cost prohibitive. One community leader described financial access to care as a problem for providers: "Do people that need health care or want health care avoid it because they can't pay for it? The answer is probably. There are a lot of people that are getting health care that can't afford to pay for it, but they're getting it anyway. So, that's a problem."

Physical Access to Health Care. The lack of local specialists and facilities poses potential limitations in appropriate access and utilization of services. Hospitals in both communities have arrangements for visiting specialists to take care of the needs of the local population, but access to specialty care is still limited. Locally, residents often have to wait a long time between scheduling an appointment and visiting a specialist. When asked how long it usually takes to get in to see a doctor, one community member said, "It depends on which doctor you go to. My [primary care] doctor tries to get you in within the same day or the next day. There are some people who might have to wait a week, two weeks. I'm still waiting on one appointment, and it'll

be almost a month from the time I made the appointment to the time I see the specialist." Also, for certain types of physical exams and tests, community members still have to drive long hours to cities where specialists practice, which can be a challenge for certain populations, especially in winter when road conditions are more severe. Demand for local providers has created the need for urgent care so that people can be seen in a timely manner. The ER is often used as an off-hour resource for primary care visits when there is no urgent care facility.

Summary

Overall, interviewees are satisfied with their local community and its general infrastructure and characteristics, including education, legal systems, and levels of trust and safety. Community members' concerns are correlated with current and anticipated demographic changes. Housing and day care supply are viewed as limiting factors for community expansion and economic development, with interviewees noting that the supply of housing and day care affects young adults and their families. Community members worry about the future of health care and housing for elderly residents as the population ages. Economic dependency on natural resources is also a concern; community members want to develop a diversified local economy. Specific to health care, interviewees did not mention substantial connections between local health care and the community beyond health care leaders' individual participation in clubs and organizations. Physical and financial access to care is problematic, with interviewees pointing toward health care workforce shortages and service line gaps as causes of inappropriate or inefficient use of health care services. Interviewees made no mention of quality information and, instead, assess health care quality based on personal experience and that of friends and relatives. Community members emphasize the need for improved HIT use, which can help standardize quality measures and make quality information available.

Chapter 5. Economic Impact of the Health Care System

Key Findings

- The combined direct and indirect impact of health care on Wyoming's economy accounts for 10.3% of the state's total employment, 10.5% of the state's total income, and 8.2% of the state's total output.
- Under current economic patterns, one job created in Wyoming's health care sector creates an additional 0.53 job, $1.00 of income earned in the health care sector leads to an additional $0.34 of income earned, and $1.00 spent in the health care sector leads to an additional $0.54 of spending in other sectors.
- Among nonmetropolitan counties, the employment multiplier effect (1.51) and income multiplier effect (1.27) are highest for Johnson County.
- Among nonmetropolitan counties, the multiplier effect with respect to economic output is highest for Park County (1.46).
- Comparing the hospital subsectors of nonmetropolitan counties, the employment multiplier effect is highest in Sheridan County (1.60), the income multiplier effect is highest in Campbell and Sheridan counties (1.36), and the multiplier effect with respect to economic output is highest in Park and Sheridan counties (1.48).

> ***Note Regarding Use of Data***
> *Impact numbers stated in this section provide us with a snapshot of the economy under current consumer patterns. Because we did not examine consumer behaviors in Wyoming, we cannot assume that dollars or jobs injected into the existing economy will result in an increase in dollars or jobs equal to the current multiplier—in other words, we cannot assume a recapture rate of 100%. The multiplier effect is useful in determining the magnitude of impact of a given sector on the economy. Multipliers allow us to see how much of the state's economy is driven by health care. Multipliers also allow us to compare the impact of the health care sector across counties.*

Methods

We used IMPLAN software and IMPLAN data for Wyoming's five health-related economic subsectors (hospitals; nursing and residential care facilities; physician offices, dentist offices, and offices of other health practitioners; home health care services, outpatient care centers, medical and diagnostic laboratories, and other ambulatory health care services; and pharmacies) to measure changes in overall economic activity as a result of change in health care subsectors. The IMPLAN software is derived from an economic input-output model, which is based on an accounting framework. Our analysis was conducted at both the state and county levels.

In some cases, we could not obtain the most accurate information required for reporting health sector impact from the IMPLAN database. When this happened, we used information from the U.S. Census Bureau's *County Business Patterns 2004* and the *American Hospital Association Annual Survey Database: Fiscal Year 2006* to improve the accuracy of the data set in order to better calculate health sector data. Additionally, members of the WHCC's rural health care delivery systems subcommittee assessed state-level data and findings for face validity.

We determined the estimates for the economic impact of the health care sector using multipliers. Multipliers represent the measure of total change throughout an economy from a one-unit change for a given sector. Multipliers are derived from the direct and indirect spending plus induced effects, all of which are obtained from the IMPLAN database Total Requirements Table. Direct spending is the initial spending of a business or institution. Indirect spending is the buying and selling that occurs between businesses or institutions. An induced effect is household spending based on the direct and indirect effects. Type I multipliers are the sum of direct and indirect spending. Type II multipliers include all three types of spending: direct, indirect, and induced. Specifically, we used Type SAM (Social Account Matrix) multipliers, which are Type II multipliers that have been adjusted based on differences in spending patterns among different income groups.

The first section of this chapter reports economic impact findings for the state as a whole. The second section is county-specific and breaks down impact by overall health care sector and hospital-specific subsector. We report findings in the following three impact categories:

- Employment, or number of jobs created
- Income, or annual dollars paid to employed persons, including proprietors
- Economic output, or total annual spending in an economic system

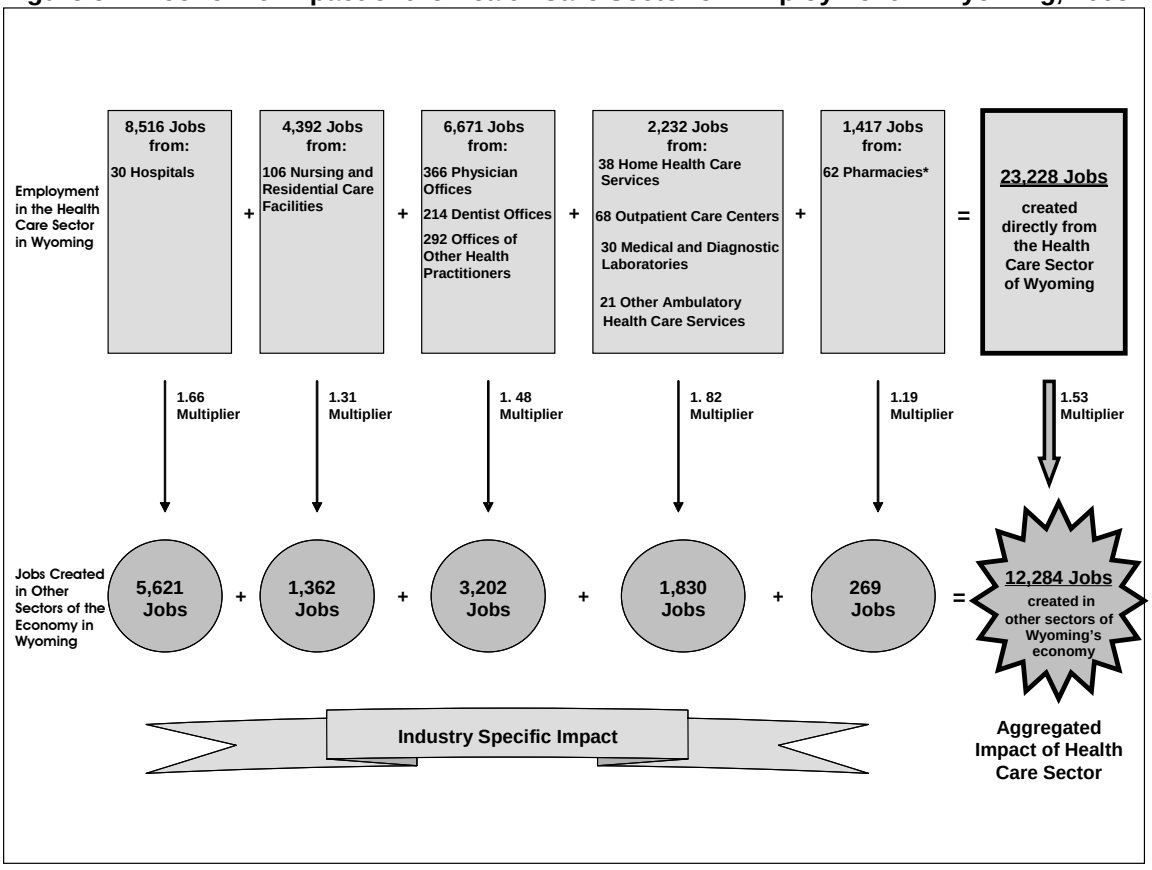
Findings

Impact of the Health Care Sector at the State Level

Employment

- The 1.53 multiplier means that one job created in the health care sector of Wyoming leads to the creation of an additional 0.53 job in other sectors of the state's economy.
- Health care in Wyoming directly creates 23,228 jobs and indirectly creates 12,284 jobs in other sectors of the state's economy. The combined effect of direct and indirect employment is 35,512 jobs.
- The overall job creation due to health care in Wyoming (35,512 jobs) accounts for 10.3% of the state's total employment.

Figure 5.1. Economic Impact of the Health Care Sector on Employment in Wyoming, 2003



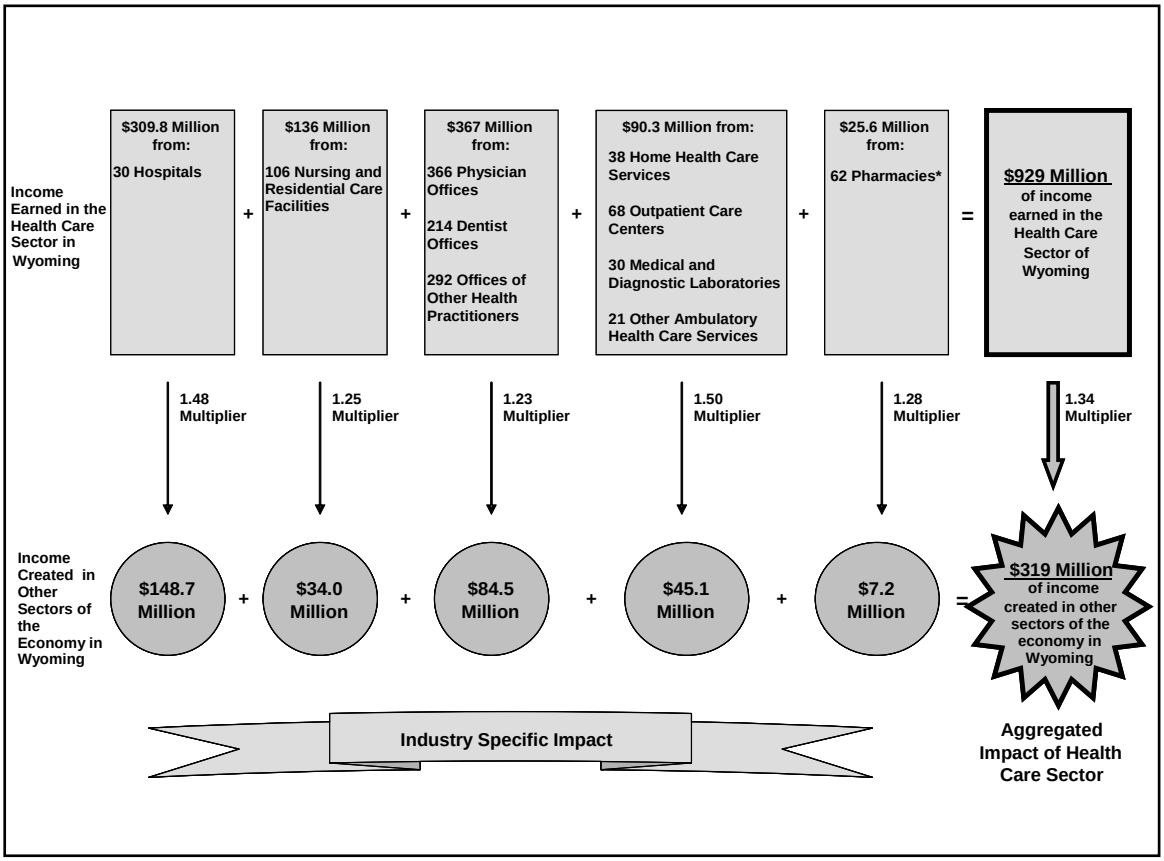
Sources: IMPLAN Data 2003. Minnesota IMPLAN Group, Inc. 2003; U.S. Census Bureau County Business Patterns, 2004. *http://www.census.gov/prod/www/abs/cbptotal.html;* and American Hospital Association Annual Survey Database: Fiscal Year 2006. Health Forum, LLC. 2002.

*Pharmacy employment and income figures are from U.S. Census County Business Patterns, 2004. Multipliers are from 2000 IMPLAN Miscellaneous Retail Industry.

Income

- The 1.34 multiplier means that $1.00 of income earned in the health care sector of Wyoming leads to an additional $0.34 of income earned in other sectors of the state's economy.
- Health care in Wyoming creates a direct income of $929 million and an indirect income of $319 million in other sectors of the state's economy. The combined effect of direct and indirect income is $1.23 billion.
- The overall income earned due to health care in Wyoming ($1.23 billion) accounts for 10.5% of the state's total income.

Figure 5.2. Economic Impact of the Health Care Sector on Income in Wyoming, 2003



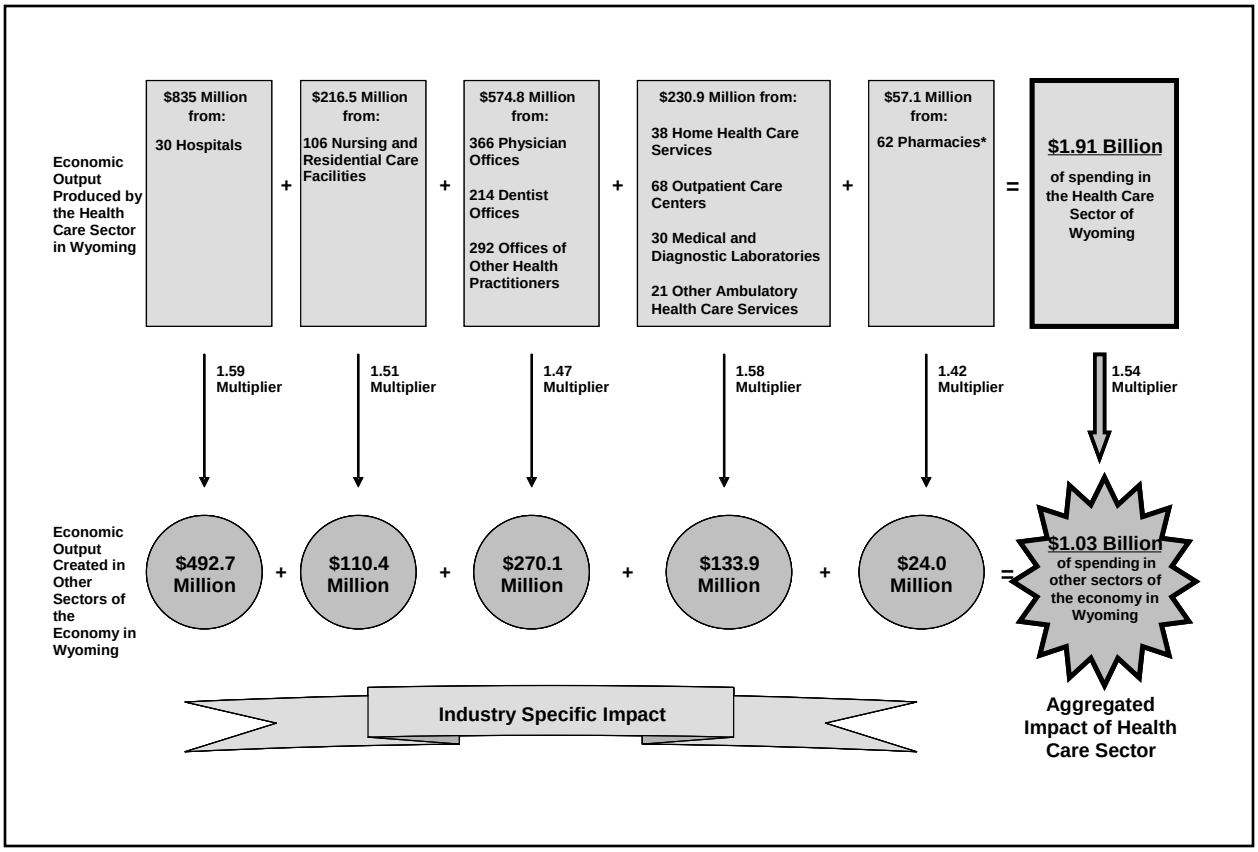
Sources: IMPLAN Data 2003. Minnesota IMPLAN Group, Inc. 2003; U.S. Census Bureau County Business Patterns, 2004. *http://www.census.gov/prod/www/abs/cbptotal.html;* and American Hospital Association Annual Survey Database: Fiscal Year 2006. Health Forum, LLC. 2002.

*Pharmacy employment and income figures are from U.S. Census County Business Patterns, 2004. Multipliers are from 2000 IMPLAN Miscellaneous Retail Industry.

Economic Output

- The 1.54 multiplier means that $1.00 spent in the health care sector of Wyoming leads to an additional $0.54 of spending in other sectors.
- Health care in Wyoming directly spends $1.91 billion and indirectly creates $1.03 billion of spending in other sectors of the state's economy. The combined effect of the direct and indirect economic output is $2.95 billion.
- The overall output created by the health care industry in Wyoming ($2.95 billion) accounts for 8.2% of the state's total output.

Figure 5.3. Impact of the Health Care Sector on Economic Output in Wyoming, 2003



Sources: IMPLAN Data 2003. Minnesota IMPLAN Group, Inc. 2003; U.S. Census Bureau County Business Patterns, 2004. *http://www.census.gov/prod/www/abs/cbptotal.html;* and American Hospital Association Annual Survey Database: Fiscal Year 2006. Health Forum, LLC. 2002.

*Pharmacy employment and income figures are from U.S. Census County Business Patterns, 2004. Multipliers are from 2000 IMPLAN Miscellaneous Retail Industry.

Economic Impact of Wyoming's Health Care Sector and Hospitals by County

Employment Impact by County – Health Care Sector

- Among all counties, the employment multiplier effect for Natrona County is the highest: every job created in the health care sector leads to an additional 0.56 job in other sectors of the county's economy.
- Among nonmetropolitan counties, the employment multiplier effect for Johnson County is the highest: every job created in the health care sector leads to an additional 0.51 job in other sectors of the county's economy.

Figure 5.4. Total Employment Impact (Direct and Indirect) of Wyoming's Health Care Sector, by County

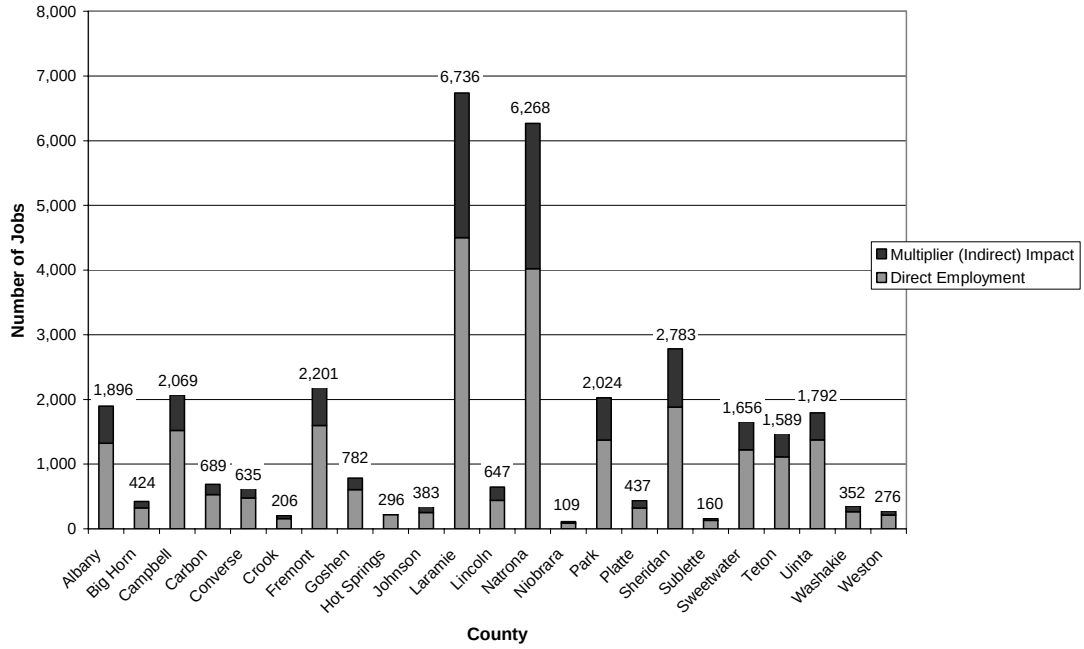


Table 5.1. Direct, Indirect, and Total Employment Impact of Wyoming's Health Care Sector, by County

County	Albany	Big Horn	Campbell	Carbon	Converse	Crook	Fremont	Goshen
Number of jobs (direct impact)	1,321	326	1,522	530	477	158	1,595	606
Number of jobs (indirect impact)	575	98	547	159	158	48	606	176
Total impact	1,896	424	2,069	689	635	206	2,201	782

County	Hot Springs	Johnson	Laramie	Lincoln	Natrona	Niobrara	Park	Platte
Number of jobs (direct impact)	221	253	4,501	441	4,020	86	1,372	321
Number of jobs (indirect impact)	75	130	2,235	206	2,248	23	652	116
Total impact	296	383	6,736	647	6,268	109	2,024	437

County	Sheridan	Sublette	Sweetwater	Teton	Uinta	Washakie	Weston
Number of jobs (direct impact)	1,883	130	1,222	1,114	1,375	266	212
Number of jobs (indirect impact)	900	30	434	475	417	86	64
Total impact	2,783	160	1,656	1,589	1,792	352	276

Sources: IMPLAN Data 2003. Minnesota IMPLAN Group, Inc., 2003; U.S. Census Bureau County Business Patterns, 2004. *http://www.census.gov/prod/www/abs/cbptotal.html*; and American Hospital Association Annual Survey Database: Fiscal Year 2006. Health Forum, LLC. 2002.

Employment Impact by County – Hospital Subsector

- Comparing the hospital subsectors of all counties, the employment multiplier effect for Natrona County is the highest: every job created in the hospital subsector leads to an additional 0.67 job in other sectors of the county's economy.
- Comparing the hospital subsectors of nonmetropolitan counties, the employment multiplier effect for Sheridan County is the highest: every job created in the hospital subsector leads to an additional 0.60 job in other sectors of the county's economy.

Figure 5.5. Total Employment Impact (Direct and Indirect) of Wyoming's Hospitals, by County

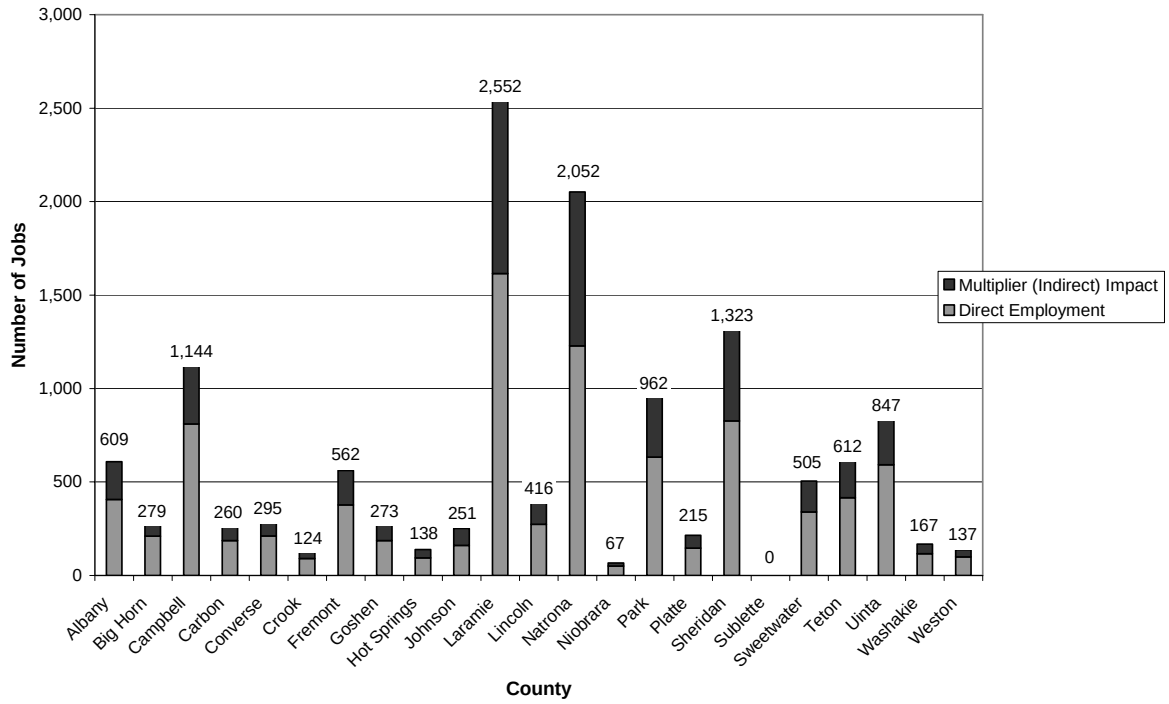


Table 5.2. Direct, Indirect, and Total Employment Impact of Wyoming's Hospitals, by County

County	Albany	Big Horn	Campbell	Carbon	Converse	Crook	Fremont	Goshen
Number of jobs (direct impact)	406	210	811	187	211	90	377	186
Number of jobs (indirect impact)	203	69	333	73	84	34	185	87
Total impact	609	279	1,144	260	295	124	562	273

County	Hot Springs	Johnson	Laramie	Lincoln	Natrona	Niobrara	Park	Platte
Number of jobs (direct impact)	94	161	1,615	274	1,229	50	633	146
Number of jobs (indirect impact)	44	90	937	142	823	17	329	69
Total impact	138	251	2,552	416	2,052	67	962	215

County	Sheridan	Sublette	Sweetwater	Teton	Uinta	Washakie	Weston
Number of jobs (direct impact)	827	0	339	416	592	116	99
Number of jobs (indirect impact)	496	0	166	196	255	51	38
Total impact	1,323	0	505	612	847	167	137

Sources: IMPLAN Data 2003. Minnesota IMPLAN Group, Inc., 2003; U.S. Census Bureau County Business Patterns, 2004. *http://www.census.gov/prod/www/abs/cbptotal.html*; and American Hospital Association Annual Survey Database: Fiscal Year 2006. Health Forum, LLC. 2002.

Income Impact by County – Health Care Sector

- Among all counties, the income multiplier effect for Natrona County is the highest: $1.00 of income earned from the health care sector leads to an additional $0.31 of income earned in other sectors of the county's economy.
- Among nonmetropolitan counties, the income multiplier effect for Johnson County is the highest: $1.00 of income earned from the health care sector leads to an additional $0.27 of income earned in other sectors of the county's economy.

Figure 5.6. Direct and Indirect Impact of Wyoming's Health Care Sector on Income (in Millions), by County

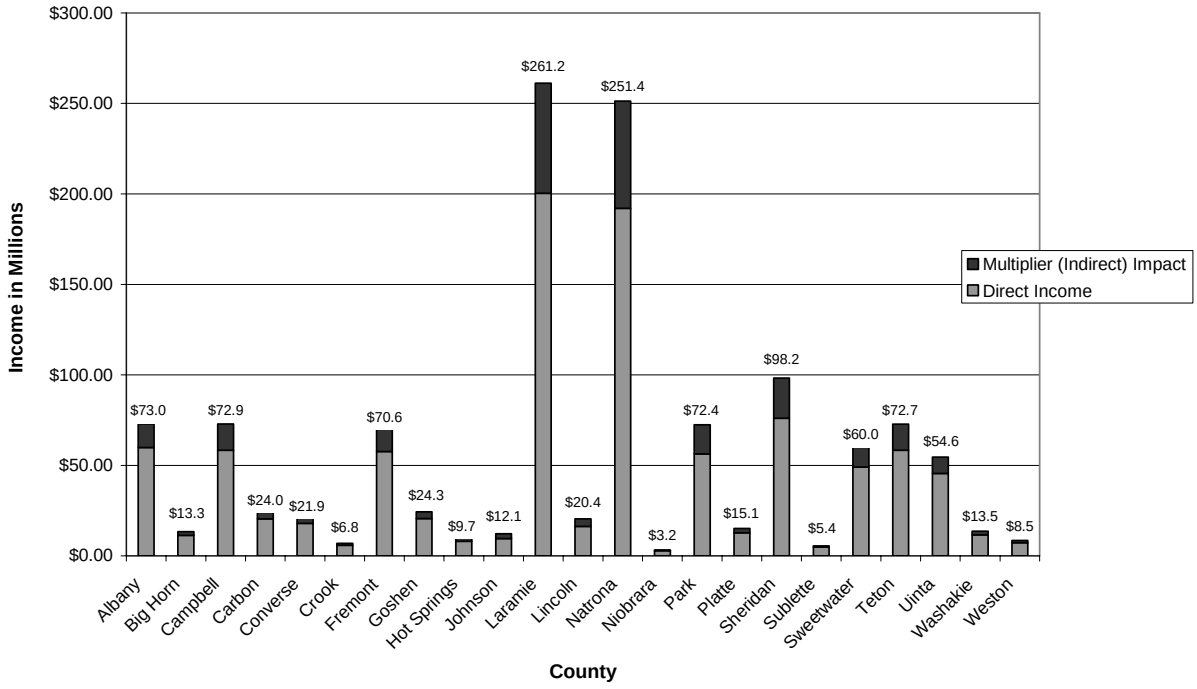


Table 5.3. Direct, Indirect, and Total Income Impact of Wyoming's Health Care Sector, by County

County	Albany	Big Horn	Campbell	Carbon	Converse	Crook	Fremont	Goshen
Income (direct impact)	$59,843,000	$11,273,000	$58,326,000	$20,418,000	$17,882,000	$5,755,000	$57,686,000	$20,654,000
Multiplier effect (indirect impact)	$13,181,020	$2,043,430	$14,529,520	$3,571,780	$3,982,790	$1,059,450	$12,925,130	$3,596,660
Total impact	$73,024,020	$13,316,430	$72,855,520	$23,989,780	$21,864,790	$6,814,450	$70,611,130	$24,250,660

County	Hot Springs	Johnson	Laramie	Lincoln	Natrona	Niobrara	Park	Platte
Income (direct impact)	$8,068,000	$9,602,000	$200,401,000	$16,305,000	$192,070,000	$2,781,000	$56,343,000	$12,731,000
Multiplier effect (indirect impact)	$1,669,360	$2,547,100	$60,842,020	$4,120,610	$59,287,490	$425,020	$16,077,370	$2,366,320
Total impact	$9,737,360	$12,149,100	$261,243,020	$20,425,610	$251,357,490	$3,206,020	$72,420,370	$15,097,320

County	Sheridan	Sublette	Sweetwater	Teton	Uinta	Washakie	Weston
Income (direct impact)	$76,079,000	$4,790,000	$48,988,000	$58,326,000	$45,520,000	$11,609,000	$7,180,000
Multiplier effect (indirect impact)	$22,170,400	$606,270	$10,998,370	$14,388,690	$9,036,320	$1,929,260	$1,318,410
Total impact	$98,249,400	$5,396,270	$59,986,370	$72,714,690	$54,556,320	$13,538,260	$8,498,410

Sources: IMPLAN Data 2003. Minnesota IMPLAN Group, Inc., 2003; U.S. Census Bureau County Business Patterns, 2004. *http://www.census.gov/prod/www/abs/cbptotal.html*; and American Hospital Association Annual Survey Database: Fiscal Year 2006. Health Forum, LLC. 2002.

Income Impact by County – Hospital Subsector

- Comparing the hospital subsectors of all counties, the income multiplier effect for Laramie County is the highest: $1.00 of income earned from the hospital subsector leads to an additional $0.39 of income earned in other sectors of the county's economy.
- Comparing the hospital subsectors of nonmetropolitan counties, the income multiplier effect for Campbell County and Sheridan County is the highest: $1.00 of income earned from the hospital subsector leads to an additional $0.36 of income earned in other sectors of the counties' respective economies.

Figure 5.7. Direct and Indirect Impact of Wyoming's Hospitals on Income (in Millions), by County

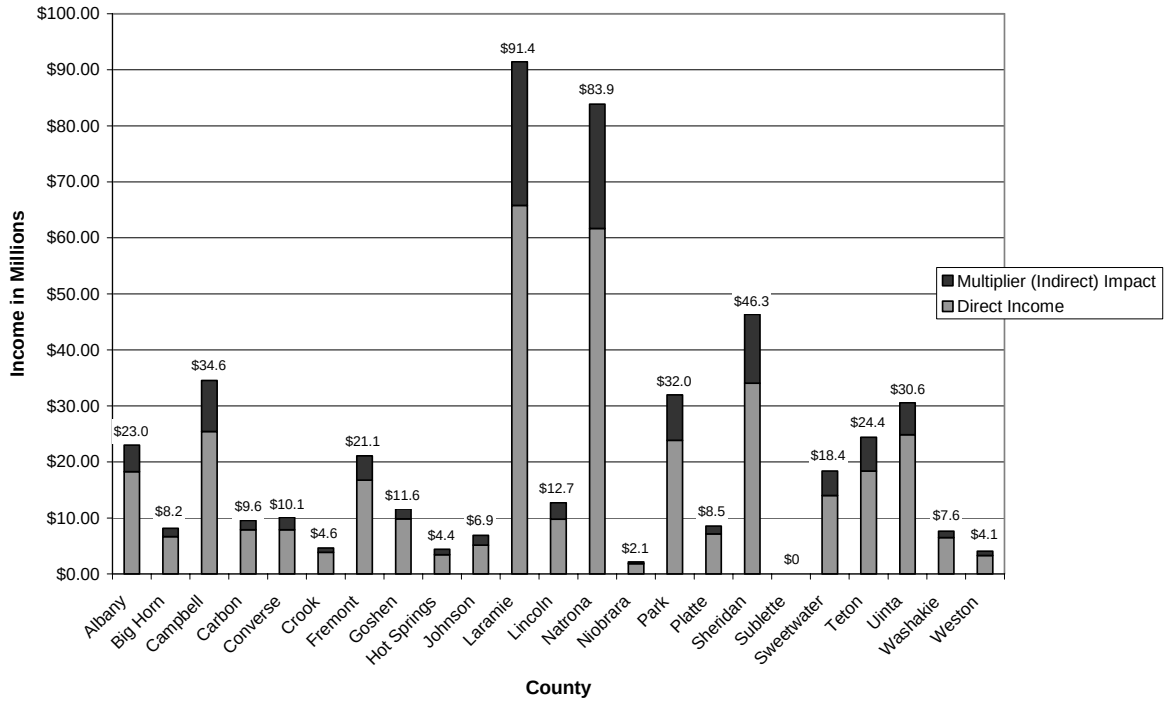


Table 5.4. Direct, Indirect, and Total Income Impact of Wyoming's Hospitals, by County

County	Albany	Big Horn	Campbell	Carbon	Converse	Crook	Fremont	Goshen
Income (direct impact)	$18,252,000	$6,686,000	$25,405,000	$7,895,000	$7,905,000	$3,894,000	$16,743,000	$9,846,000
Multiplier effect (indirect impact)	$4,745,520	$1,470,920	$9,145,800	$1,657,950	$2,213,400	$739,860	$4,353,180	$1,772,280
Total impact	$22,997,520	$8,156,920	$34,550,800	$9,552,950	$10,118,400	$4,633,860	$21,096,180	$11,618,280

County	Hot Springs	Johnson	Laramie	Lincoln	Natrona	Niobrara	Park	Platte
Income (direct impact)	$3,421,000	$5,147,000	$65,782,000	$9,764,000	$61,667,000	$1,819,000	$23,870,000	$7,172,000
Multiplier effect (indirect impact)	$992,090	$1,749,980	$25,654,980	$2,929,200	$22,200,120	$327,420	$8,115,800	$1,362,680
Total impact	$4,413,090	$6,896,980	$91,436,980	$12,693,200	$83,867,120	$2,146,420	$31,985,800	$8,534,680

County	Sheridan	Sublette	Sweetwater	Teton	Uinta	Washakie	Weston
Income (direct impact)	$34,061,000	$0	$14,030,000	$18,362,000	$24,846,000	$6,478,000	$3,287,000
Multiplier effect (indirect impact)	$12,261,960	$0	$4,349,300	$6,059,460	$5,714,580	$1,166,040	$788,880
Total impact	$46,322,960	$0	$18,379,300	$24,421,460	$30,560,580	$7,644,040	$4,075,880

Sources: IMPLAN Data 2003. Minnesota IMPLAN Group, Inc., 2003; U.S. Census Bureau County Business Patterns, 2004. *http://www.census.gov/prod/www/abs/cbptotal.html*; and American Hospital Association Annual Survey Database: Fiscal Year 2006. Health Forum, LLC. 2002.

Economic Output Impact by County – Health Care Sector

- Among all counties, the multiplier effect with respect to economic output for Natrona County is the highest: $1.00 spent in the health care sector leads to an additional $0.50 of spending in other sectors of the county's economy.
- Among nonmetropolitan counties, the multiplier effect with respect to economic output for Park County is the highest: $1.00 spent in the health care sector leads to an additional $0.46 of spending in other sectors of the county's economy.

Figure 5.8. Direct and Indirect Impact of Wyoming's Health Care Sector on Economic Output, by County

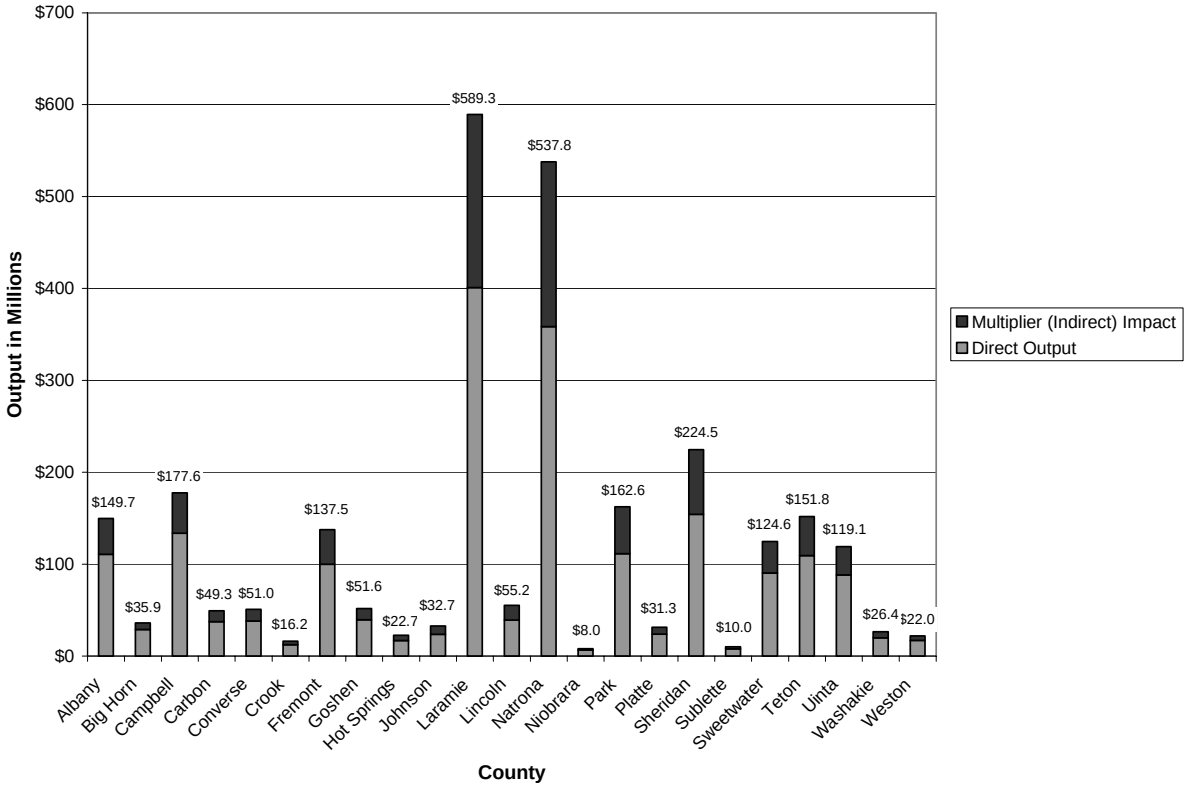


Table5.5. Direct, Indirect, and Total Economic Output Impact of Wyoming's Health Care Sector, by County

County	Albany	Big Horn	Campbell	Carbon	Converse	Crook	Fremont	Goshen
Output (direct impact)	$110,673,000	$28,854,000	$133,651,000	$37,244,000	$38,095,000	$12,324,000	$99,913,000	$39,491,000
Multiplier effect (indirect impact)	$38,994,230	$7,035,650	$43,915,390	$12,045,970	$12,880,210	$3,875,760	$37,591,700	$12,068,130
Total impact	$149,667,230	$35,889,650	$177,566,390	$49,289,970	$50,975,210	$16,199,760	$137,504,700	$51,559,130

County	Hot Springs	Johnson	Laramie	Lincoln	Natrona	Niobrara	Park	Platte
Output (direct impact)	$16,742,000	$23,570,000	$401,052,000	$39,313,000	$358,440,000	$6,472,000	$111,425,000	$23,752,000
Multiplier effect (indirect impact)	$5,987,790	$9,104,840	$188,200,510	$15,866,690	$179,318,090	$1,532,880	$51,139,740	$7,554,870
Total impact	$22,729,790	$32,674,840	$589,252,510	$55,179,690	$537,758,090	$8,004,880	$162,564,740	$31,306,870

County	Sheridan	Sublette	Sweetwater	Teton	Uinta	Washakie	Weston
Output (direct impact)	$154,390,000	$7,810,000	$90,375,000	$109,301,000	$88,317,000	$19,814,000	$16,938,000
Multiplier effect (indirect impact)	$70,068,200	$2,164,560	$34,227,440	$42,500,950	$30,797,820	$6,621,310	$5,039,790
Total impact	$224,458,200	$9,974,560	$124,602,440	$151,801,950	$119,114,820	$26,435,310	$21,977,790

Sources: IMPLAN Data 2003. Minnesota IMPLAN Group, Inc., 2003; U.S. Census Bureau County Business Patterns, 2004. *http://www.census.gov/prod/www/abs/cbptotal.html*; and American Hospital Association Annual Survey Database: Fiscal Year 2006. Health Forum, LLC. 2002.

Economic Output Impact by County – Hospital Subsector

- Comparing the hospital subsectors of all counties, the multiplier effect with respect to economic output for Natrona County is the highest: $1.00 spent in the hospital subsector leads to an additional $0.54 of spending in other sectors of the county's economy.
- Comparing the hospital subsectors of nonmetropolitan counties, the multiplier effect with respect to economic output for Park County and Sheridan County is the highest: $1.00 spent in the hospital subsector leads to an additional $0.48 of spending in other sectors of the counties' respective economies.

Figure 5.9. Direct and Indirect Impact of Wyoming's Hospitals on Economic Output, by County

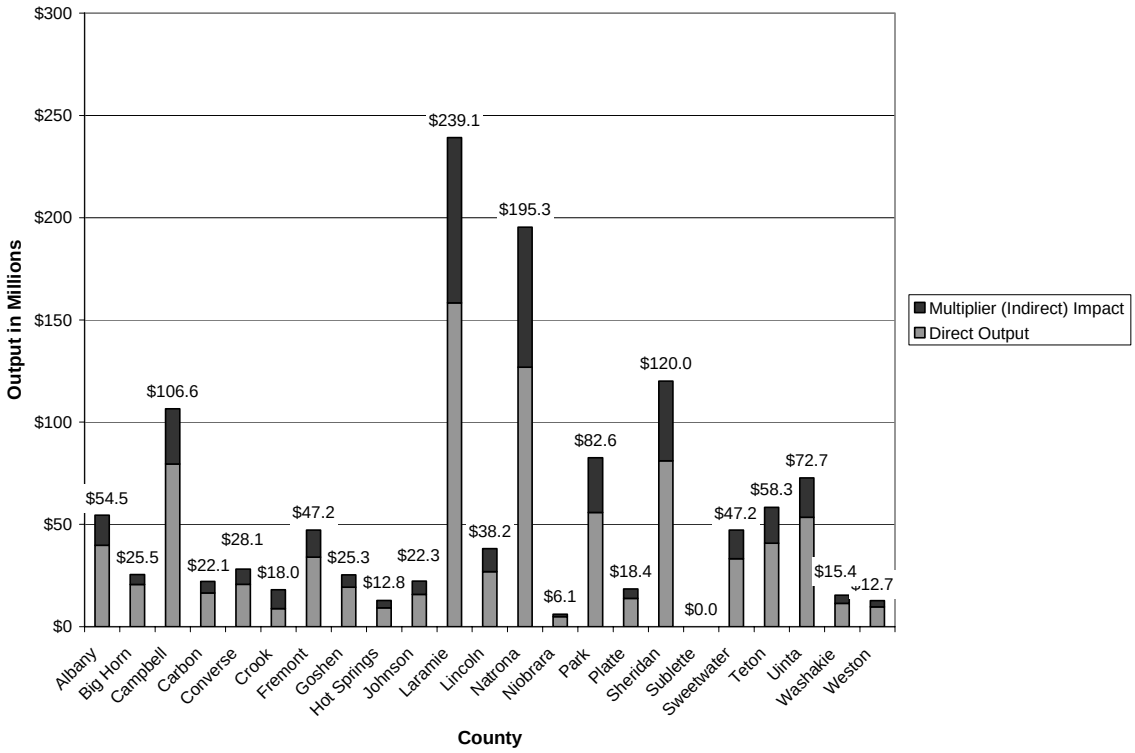


Table 5.6. Direct, Indirect, and Total Economic Output Impact of Wyoming's Hospitals, by County

County	Albany	Big Horn	Campbell	Carbon	Converse	Crook	Fremont	Goshen
Output (direct impact)	$39,814,000	$20,594,000	$79,530,000	$16,493,000	$20,692,000	$8,826,000	$33,984,000	$19,303,000
Multiplier effect (indirect impact)	$14,731,180	$4,942,560	$27,040,200	$5,607,620	$7,449,120	$9,212,580	$13,253,760	$5,983,930
Total impact	$54,545,180	$25,536,560	$106,570,200	$22,100,620	$28,141,120	$18,038,580	$47,237,760	$25,286,930

County	Hot Springs	Johnson	Laramie	Lincoln	Natrona	Niobrara	Park	Platte
Output (direct impact)	$9,218,000	$15,788,000	$158,375,000	$26,870,000	$126,833,000	$4,903,000	$55,830,000	$13,827,000
Multiplier effect (indirect impact)	$3,595,020	$6,473,080	$80,771,250	$11,285,400	$68,489,820	$1,176,720	$26,798,400	$4,562,910
Total impact	$12,813,020	$22,261,080	$239,146,250	$38,155,400	$195,322,820	$6,079,720	$82,628,400	$18,389,910

County	Sheridan	Sublette	Sweetwater	Teton	Uinta	Washakie	Weston
Output (direct impact)	$81,110,000	$0	$33,244,000	$40,795,000	$53,491,000	$11,427,000	$9,708,000
Multiplier effect (indirect impact)	$38,932,800	$0	$13,962,480	$17,541,850	$19,256,760	$3,999,450	$3,009,480
Total impact	$120,042,800	$0	$47,206,480	$58,336,850	$72,747,760	$15,426,450	$12,717,480

Sources: IMPLAN Data 2003. Minnesota IMPLAN Group, Inc., 2003; U.S. Census Bureau County Business Patterns, 2004. *http://www.census.gov/prod/www/abs/cbptotal.html*; and American Hospital Association Annual Survey Database: Fiscal Year 2006. Health Forum, LLC. 2002.

Summary

Health care creates not only direct employment, income, and spending within its own sector but has an indirect (multiplier) effect in other sectors of the economy. In order to produce merchandise and services sold to the health care sector, additional jobs and income are created in other sectors. In addition, the induced household spending associated with the combined (direct and indirect) employment and income effect of the health care sector creates further economic activity and effect. At the state level, our economic impact analysis shows that one job created in the health care sector of Wyoming leads to the creation of an additional 0.53 job in other sectors of the state's economy. Therefore, the overall job creation due to health care in Wyoming (35,512 jobs) accounts for 10.3% of the state's total employment. The results also show that $1.00 of income earned in the health care sector of Wyoming leads to an additional $0.34 of income earned in other sectors of the state's economy. Therefore, the overall income earned due to health care in Wyoming ($1.23 billion) accounts for 10.5% of the state's total income. In addition, $1.00 spent in the health care sector of Wyoming leads to an additional $0.54 of spending in other sectors. As a result, the overall output created by the health care industry in Wyoming ($2.95 billion) accounts for 8.2% of the state's total output.

The multiplier effect is also significant at the county level for Wyoming. For instance, our analysis shows that one job created in the health care sector of a Wyoming county leads to the creation of an additional (0.23-0.56) job in other sectors of the county's economy. And $1.00 of income earned in the health care sector of a Wyoming county leads to an additional ($0.13-$0.31) of income earned in other sectors of the county's economy. Furthermore, $1.00 spent in the health care sector of a Wyoming county leads to an additional ($0.24-$0.50) of spending in other sectors of the county's economy.

Chapter 6. Hospital Inpatient Out-migration

Key Findings

- In 2003, the top three Wyoming counties with the most out-migrating hospital discharges to Colorado, Utah, and Nebraska were Sweetwater, Laramie, and Uinta.
- In 2003, the top three disease specialty areas with the most Wyoming out-migrating hospital discharges to Colorado, Utah, and Nebraska were orthopedics, general surgery, and obstetrics.
- In 2003, the estimated total lost **charges** for Wyoming hospitals due to inpatient out-migration to Colorado, Utah, and Nebraska were $144.7 million.
- In 2003, the estimated total lost **revenue** for Wyoming hospitals due to inpatient out-migration to Colorado, Utah, and Nebraska was $101.3 million.
- In 2003, the estimated total **less spending** for Wyoming communities due to hospital inpatient out-migration to Colorado, Utah, and Nebraska was $32.5 million.

Note Regarding the Use of Data
The estimated financial impact of hospital inpatient out-migration in terms of lost hospital charge, lost hospital revenue, and less community spending are based on a developed methodology and an economic model, which both have limitations. Although the potential lost revenue for Wyoming hospitals due to inpatient out-migration to Colorado, Utah, and Nebraska was estimated, not all revenue may be recaptured by Wyoming hospitals. In order to recapture some of the business lost to neighboring states, Wyoming's health care system may need to enhance its capability and capacity to deliver relevant health care services (supply side). In addition, consumers' utilization behavior, including the determinants of their satisfaction, should also be examined (demand side). Having said that, in some situations the local market may have reached a saturation point (or be close to that point), so that it may be difficult to recapture the lost business.

Methods

Introduction

We used 2003 hospital discharge data for Wyoming, Colorado, Utah, and Nebraska to conduct this patient out-migration analysis.[49] Each data set contains inpatient discharge records from hospitals within each state in 2003. The information used for the analysis included patient demographic characteristics (i.e., age, gender, race), health insurance coverage, ZIP code or county of residence, charge, length of stay, and primary diagnosis. We conducted the analysis and present the results based on the destination state of patient out-migration (Colorado, Utah, or Nebraska). For each destination state, we first present the profile of the out-migrating patients by gender, age, race,[50] payer type, disease specialty area, and ZIP code and county of residence. Then, using the hospital discharge data from the destination state, we show the observed charge incurred by out-migrating patients in the hospitals of the destination state (i.e., unadjusted charge). In addition, with a method we developed using hospital discharge data from both Wyoming and the destination state, we present an estimate of the simulated lost hospital charge (i.e., adjusted charge) for Wyoming hospitals due to patient out-migration (see below for the description of our method). We then re-estimated both the unadjusted and adjusted charges by excluding the patients who lived in ZIP codes with a hospital service area (HSA) outside Wyoming. We used the definitions of HSAs from the Dartmouth Atlas of Health Care. Using these new estimates, we show the hospital charge theoretically considered to reflect a "more realistic" patient out-migration from Wyoming. Furthermore, we identify the top five Wyoming ZIP codes with the most out-migrating discharges to the destination state and present a market share analysis by disease specialty area for each ZIP code. The market share analysis identifies the disease specialty areas for which Wyoming hospitals may be able to recapture lost business from the destination state. Due to data availability, we assumed that the denominator of the estimated market shares only includes the hospital discharges among four states (Wyoming, Colorado, Utah, and Nebraska). This assumption may hold stronger if a ZIP code of interest is geographically closer to the border among the four states.

Method of Estimating the Simulated Lost Hospital Charge for Wyoming Hospitals

The observed hospital charge figures in the hospitals of the destination state do not precisely indicate the lost revenue (or lost hospital charge) for Wyoming hospitals in that patients might have incurred a different charge amount if they had received the same care in a Wyoming hospital. The potential lost hospital charge for Wyoming hospitals, if estimated, may better reflect the financial implication for Wyoming hospitals of lost business due to patient out-migration. Therefore, we used hospital discharge data from both Wyoming and the destination state to simulate what charge amount may have been incurred if the out-migrating patients had received their treatment in a Wyoming hospital. The details of the estimation method are as follows:

[49] Wyoming data were provided by the Wyoming Hospital Association. Nebraska data were provided by the Nebraska Hospital Association. Data for Colorado and Utah were obtained from the Healthcare Cost and Utilization Project of the Agency for Healthcare Research and Quality.
[50] Race data are not available for the patients out-migrating to Utah and Nebraska.

We used patient length of stay as a proxy measure for case-mix (or severity of disease), which indicates the amount of resources required to treat each patient in the hospital. In order to estimate the discrepancy between hospital charges in the destination state and those in Wyoming, we used state-wide data and calculated the average hospital charge per day by disease specialty area for both the destination state and Wyoming. Then, a hospital charge-difference ratio, which may reflect the difference between the charging practices of hospitals in the destination state and those in Wyoming, was estimated for each disease specialty area. The formula of this ratio can be expressed as:

$R_{j\ (DS\ vs.\ WY)} = AC_{j\ (DS)} / AC_{j\ (WY)}$

where $R_{j\ (DS\ v.s.\ WY)}$ = Hospital Charge-Difference Ratio (the destination state versus Wyoming) for disease specialty area *j*; $AC_{j\ (DS)}$ = Average Charge Per Day for patients under disease specialty area *j* treated in hospitals of the destination state; and $AC_{j\ (WY)}$ = Average Charge Per Day for patients under disease specialty area *j* treated in Wyoming hospitals

Appendices G, H, and I show the estimated hospital charge-difference ratios by disease specialty area between each destination state and Wyoming. The ratios for average length of stay for patients in the destination state to Wyoming are also listed for each specialty area. The ratio for average length of stay may indicate the general case-mix difference between patients of the destination state and patients in Wyoming under the same disease specialty area, while the hospital charge-difference ratio estimates the specialty-specific difference between hospital charge in the two states after controlling for patient case-mix (i.e., length of stay as a proxy).

The simulated lost hospital charge for Wyoming hospitals due to patient out-migration to the destination state was then estimated by dividing the patient's actual (or observed) charge amount incurred in hospitals of the destination state by the corresponding hospital charge-difference ratio for the disease specialty area. The formula can be expressed as follows:

$SC_{ij\ (WY)} = OC_{ij\ (DS)} / R_{j\ (DS\ vs.\ WY)}$

where $SC_{ij\ (WY)}$ = the simulated charge for Wyoming hospitals if patient *i* had received the same treatment under specialty area *j* in a Wyoming hospital; $OC_{ij\ (DS)}$ = the actual (or observed) hospital charge incurred by patient *i* for the treatment under specialty area *j* in a hospital of the destination state; and $R_{j\ (DS\ vs.\ WY)}$ = Hospital Charge-Difference Ratio (the destination state versus Wyoming) for disease specialty area *j*.

Limitation of the Method

Due to data availability, we could only use length of stay as a proxy for severity of disease. However, different patients may have a different degree of disease severity and thus need different levels of hospital resources, even though they have the same length of stay. Therefore, the estimated (simulated) lost hospital charge due to patient out-migration may be somewhat biased due to inadequately controlling for patient case mix. In other words, the estimated hospital charge-difference ratios may still reflect the difference between the case mix of patients in the

destination state and that in Wyoming. Therefore, we also demonstrated the ratios for average length of stay in Appendices G, H, and I as a reference for the readers of this report. The results on the estimated (simulated) lost charge for Wyoming hospitals due to patient out-migration should be used cautiously by taking the case-mix issue into account.

Findings

Summarized Financial Impact of Wyoming's Hospital Inpatient Out-migration

- The estimated total lost **charges** for Wyoming hospitals due to inpatient out-migration to Colorado, Utah, and Nebraska were $144.7 million in 2003.
- The estimated total lost **revenue** for Wyoming hospitals due to inpatient out-migration to Colorado, Utah, and Nebraska was $101.3 million in 2003.
- The estimated total **less spending** for Wyoming communities due to hospital inpatient out-migration to Colorado, Utah, and Nebraska was $32.5 million in 2003.
- The estimated financial impact is broken down by the destination state of patient out-migration as follows:

	2003 Dollar Estimates in Millions			
	CO	UT	NE	Total
Total charges incurred in the destination state	$110	$64	$5.2	*
Estimated lost charges for WY hospitals	$80	$60	$4.7	$144.7
Estimated lost revenue for WY hospitals	$56	$42	$3.3	$101.3
Estimated less spending in WY communities	$18	$13.5	$1	$32.5

*The total charges incurred in the destination states are not aggregated because of the difference in hospital charge practice among the states.

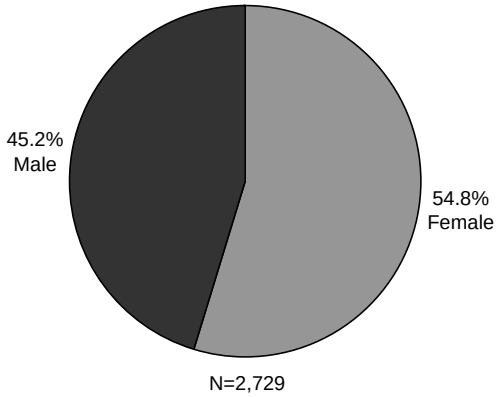
Hospital Inpatient Out-migration from Wyoming to Colorado

Profile of Wyoming Inpatients Out-migrating to Colorado Hospitals

In 2003, a total of 2,730 Colorado hospital discharges were contributed by Wyoming residents. These discharges constituted about 5.67% of the total discharges of Wyoming patients from hospitals in Wyoming, Colorado, Utah, and Nebraska (a total of 48,155 discharges) in the same year. Of the 2,730 out-migrating discharges, more than half (55%) were attributed to female patients, and more than one-fifth (22%) were attributed to elderly patients aged 65 or older (Figures 6.1 and 6.2). The great majority of out-migrating discharges (91%) were attributed to white patients (Figure 6.3). In addition, private insurance covered half of the out-migrating discharges and Medicare or Medicaid covered two-fifths (Figure 6.4). The top three disease specialty areas with the most out-migrating discharges were orthopedics (453 discharges; 18%), general surgery (416 discharges; 16%), and obstetrics (197 discharges; 8%). The detailed distribution of the out-migrating discharges among different disease specialty areas is shown in

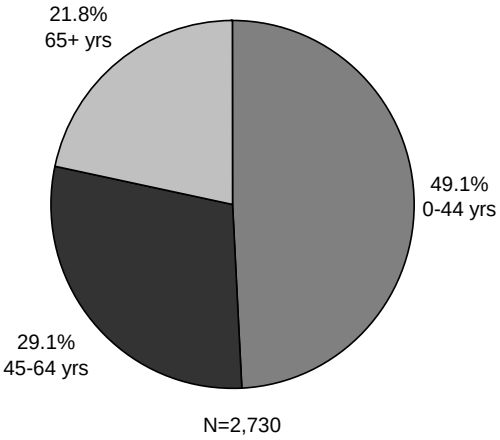
Table 6.1. The top 10 Wyoming ZIP codes (along with the corresponding county names) where the most out-migrating discharges originated are listed in Table 6.2; ZIP code 82001 (in Laramie County) contributed the most out-migrating discharges to Colorado.[51] In fact, the top five Wyoming ZIP codes with the most out-migrating discharges to Colorado were located in either Laramie County or Albany County. [52]

Figure 6.1. Gender Distribution of Wyoming's Out-migrating Inpatients to Colorado Hospitals, 2003



Source: Healthcare Cost and Utilization Project State Inpatient Sample, 2003.

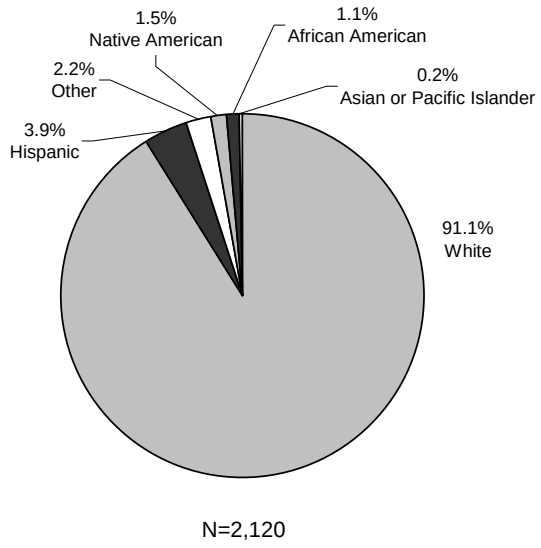
Figure 6.2. Age Distribution of Wyoming's Out-migrating Inpatients to Colorado Hospitals, 2003



Source: Healthcare Cost and Utilization Project State Inpatient Sample, 2003.

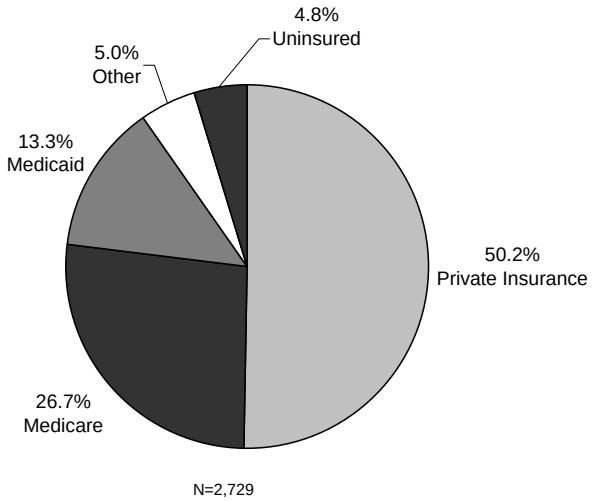
[51] See Appendix J for the detailed distribution of out-migrating discharges to Colorado among all Wyoming ZIP codes.
[52] See Appendix K for the distribution of out-migrating hospital discharges from Wyoming to Colorado by county of residence in Wyoming.

Figure 6.3. Race Distribution of Wyoming's Out-migrating Inpatients to Colorado Hospitals, 2003



Source: Healthcare Cost and Utilization Project State Inpatient Sample, 2003.

Figure 6.4. Payer Type Distribution of Wyoming's Out-migrating Inpatients to Colorado Hospitals, 2003



Source: Healthcare Cost and Utilization Project State Inpatient Sample, 2003.

Table 6.1. Wyoming's Out-migrating Inpatients to Colorado Hospitals by Disease Specialty, Ranked Based on Number of Discharges, 2003

Disease Specialty	Number of Discharges	% Out of Total CO Discharges	% Out of WY Discharges
Orthopedics	453	17.6	11.2
General Surgery	416	16.1	10.8
Obstetrics	197	7.6	2.9
Neonatology	183	7.1	10.3
Cardiology	120	4.7	3.1
Neurosurgery	115	4.5	23.8
Oncology	113	4.4	23.3
Thoracic Surgery	107	4.2	14.5
Gastroenterology	106	4.1	3.1
Pulmonary	105	4.1	2.3
General Medicine	101	3.9	6.6
Gynecology	76	3.0	4.2
Vascular Surgery	75	2.9	23.4
Urology	74	2.9	7.3
Psychiatry	72	2.8	4.8
Neurology	69	2.7	6.0
Normal Newborns	62	2.4	1.3
Otolaryngology	38	1.5	4.9
Nephrology	27	1.1	3.8
Hematology	22	0.9	7.0
Endocrine	20	0.8	1.4
Other	18	0.7	10.0
Rheumatology	4	0.2	2.1
Dermatology	3	0.1	5.6
Ophthalmology	2	0.1	4.8
Total	**2578**	**100.0**	

Source: Healthcare Cost and Utilization Project State Inpatient Sample, 2003; Wyoming Hospital Association, 2003.

Table 6.2. Wyoming's Out-migrating Inpatients (to Colorado Hospitals) by Top Ten ZIP Codes of Wyoming Residence, Ranked based on Number of Discharges, 2003

ZIP Code	County	Number of Discharges	Percent
82001	Laramie	345	12.64
82009	Laramie	317	11.61
82070	Albany	226	8.28
82007	Laramie	171	6.26
82072	Albany	147	5.38
82240	Goshen	102	3.74
82601	Natrona	94	3.44
82501	Fremont	90	3.30
82301	Carbon	80	2.93
82201	Platte	79	2.89
Total		**1651**	**60.47**

Source: Healthcare Cost and Utilization Project State Inpatient Sample, 2003.

Financial Implication of Out-migration of Wyoming Inpatients to Colorado Hospitals

Hospital Charge Incurred By Wyoming Patients in Colorado Hospitals

The total charge incurred in Colorado hospitals for all 2,730 out-migrating discharges from Wyoming was about $110 million ($109,782,670) in 2003. The average hospital charge was $40,317, with an average length of stay of 6.9 days. The hospital charge associated with the inpatient out-migration from Wyoming to Colorado is ranked by disease specialty area in Table 6.3 (i.e., the unadjusted charges). The top three specialty areas with the most incurred hospital charge due to inpatient out-migration were general surgery ($18,837,958), neonatology ($16,830,403), and orthopedics ($14,993,585).

Table 6.3. Hospital Charges Associated With Inpatient Out-migration From Wyoming to Colorado by Disease Specialty, Ranked Based on Unadjusted Charges,* 2003

Disease Specialty	Unadjusted Charges
General Surgery	$18,837,958
Neonatology	$16,830,403
Orthopedics	$14,993,585
Thoracic Surgery	$10,470,037
Oncology	$9,745,123
Neurosurgery	$5,030,127
Pulmonary	$3,428,847
Vascular Surgery	$3,057,873
Cardiology	$3,020,377
Urology	$2,914,656
General Medicine	$2,594,209
Obstetrics	$2,421,960
Other	$2,355,565
Gastroenterology	$2,166,167
Neurology	$1,940,120
Gynecology	$1,229,004
Otolaryngology	$975,608
Nephrology	$925,583
Psychiatry	$741,665
Hematology	$624,225
Endocrine	$286,313
Normal Newborns	$107,340
Rheumatology	$72,415
Dermatology	$55,580
Ophthalmology	$23,460
Unknown***	$4,934,470
Total	**$109,782,670**

Source: Healthcare Cost and Utilization Project State Inpatient Sample, 2003; Wyoming hospital discharge data set from the Wyoming Hospital Association, 2003.

*Unadjusted charge figures come from the Colorado hospital discharge data.

Simulated Lost Hospital Charge and Revenue for Wyoming Hospitals Due to Patient Out-migration to Colorado

The potential lost hospital charges by disease specialty area for Wyoming hospitals due to inpatient out-migration to Colorado, although estimated using our method, is not presented here due to the large discrepancy between these charge estimates and the observed charge data in Colorado hospitals.[53] Although the difference between Colorado and Wyoming hospitals in patient case-mix (which the length of stay data may not totally account for) and charge practices may explain some of the discrepancy, it does not explain why the discrepancy is so large. Further investigation is needed to answer this question.

Using data from *The Comparative Performance of U.S. Hospitals: The 2006 Sourcebook*,[54] we estimated the total potential lost hospital charges for Wyoming hospitals due to inpatient out-migration to Colorado at $80 million ($80,133,336) in 2003.[55] We then further estimated the total potential lost revenue for Wyoming hospitals due to inpatient out-migration to Colorado in 2003 at $56 million ($56,093,335).[56] Based on our economic impact analysis, for each $1.00 less spent in Wyoming hospitals, an average of $0.32 less will be spent in other economic sectors of Wyoming's communities.[57] If we use the estimated lost hospital revenue due to inpatient out-migration as a proxy for economic output, then we can estimate that about $18 million ($17,949,867) less was spent in other economic sectors of Wyoming's communities due to hospital inpatient out-migration to Colorado in 2003.

Hospital Charge and Revenue Estimate After Excluding Justifiable Patient Out-migration to Colorado Hospitals

Because the HSAs for the residents of six Wyoming ZIP codes were actually in Colorado,[58] the out-migrating discharges originating from these six ZIP codes were theoretically "justifiable" and thus may need to be excluded from the estimation of the financial impact due to inpatient out-migration. Table 6.4 shows the out-migrating discharges from these six Wyoming ZIP codes. A total of 79 discharges (2.9% of the total out-migrating discharges from Wyoming to Colorado) were justifiable. After excluding these 79 discharges, we re-estimated the total charges incurred

[53] As a reference, Appendix L shows the estimated (simulated) lost charge for Wyoming hospitals due to patient out-migration to Colorado (i.e., adjusted charges) by disease specialty area.
[54] Solucient. (2006). *The Comparative Performance of U.S. Hospitals: The 2006 Sourcebook.* Evanston, IL: Solucient, LLC.
[55] We used the 50th percentile gross revenue (i.e., charge) per adjusted hospital discharge for Colorado ($12,058) and Wyoming ($8,797) in 2003 to come up with an estimated average ratio of hospital charge difference between the two states (1.37). Then, the total charge incurred in Colorado hospitals due to inpatient out-migration from Wyoming ($109,782,670) was divided by 1.37 to obtain the estimate for the total potential lost hospital charges for Wyoming hospitals ($80,133,336).
[56] We used the 50th percentile percentage of reductions from gross revenue for Wyoming hospitals in 2003 (i.e., 30%) from *The Comparative Performance of U.S. Hospitals: The 2006 Sourcebook* (2006, Evanston, IL: Solucient, LLC) to estimate the revenue associated with the total potential lost hospital charges for Wyoming hospitals due to inpatient out-migration to Colorado.
[57] We used the average hospital-sector multiplier for economic output (1.32) obtained from our county-level economic impact analysis for Wyoming's health care sector.
[58] Based on the Hospital Service Areas defined by the Dartmouth Atlas of Health Care.

by out-migrating discharges in Colorado hospitals at $108,788,734, the total potential lost hospital charges for Wyoming hospitals at $79,407,835, and the total potential lost revenue for Wyoming hospitals at $55,585,485 (based on a total of 2,651 discharges).

Table 6.4. Out-migrating Discharges Originating From Wyoming ZIP Codes With Hospital Service Areas* in Colorado

ZIP Codes	County	Number of Discharges	Percent
82321	Carbon	57	72.15
82323	Carbon	13	16.46
82332	Carbon	5	6.33
82714	Crook	1	1.27
82712	Crook	2	2.53
82720	Crook	1	1.27
Total**		**79**	**100.01**

Source: Healthcare Cost and Utilization Project State Inpatient Sample, 2003.

*Based on the Dartmouth Atlas of Health Care.

**Due to rounding, percentage may not sum to 100%.

Market Share Analysis for the Top Five Wyoming ZIP Codes With the Most Out-migrating Discharges to Colorado Hospitals

Although we estimated the potential lost revenue for Wyoming hospitals due to inpatient out-migration to Colorado at $56 million, not all of this revenue can be recaptured by Wyoming hospitals. It might be more reasonable to assume that if Wyoming hospitals already had a market share (for a certain type of disease specialty area) in the middle range (e.g., somewhere between 30% and 85%), then it would be feasible for them to recapture some of the lost business due to inpatient out-migration.[59] Based on this assumption, we identified the specialty areas for which Wyoming hospitals may be able to recapture some of the lost business in the top five ZIP codes with the most out-migrating discharges to Colorado (the highlighted specialty areas shown in Tables 6.5-6.9). However, these results are based on proxy estimates of market share given that hospital discharge data are available for only Wyoming and three neighboring states (Colorado, Utah, and Nebraska), so the results may be more reliable if a ZIP code of interest is geographically closer to the border between Wyoming and the three neighboring states.[60] Based on the map shown in Appendix M, all five ZIP codes for which data are shown in Tables 6.5-6.9 are located around the border between Wyoming and Colorado and between Wyoming and Nebraska. Therefore, the results of the identified specialty areas with a potential for Wyoming hospitals to recapture some of the lost business may be more reliable for these five ZIP codes, given their geographic proximity to the state's border.

[59] The rationale for this assumption is that if the market share of Wyoming hospitals is too small (e.g., smaller than 30%), it might indicate that they do not have the adequate capacity to deliver services related to the specialty area of interest. On the other hand, if the market share of Wyoming hospitals is too large (e.g., greater than 85%), it might indicate that they have reached a market saturation point (or close to the point) so that it would be difficult for them to recapture the lost business.

[60] Due to the data availability, we assumed that the denominator of the market shares (i.e., 100%) includes only the hospital discharges distributed among the hospitals of the four states (Wyoming, Colorado, Utah, and Nebraska). Therefore, the closer to the state's border a ZIP code of interest is, the stronger this assumption holds true.

Table 6.5. Distribution of Hospital Discharges Among Hospitals of Wyoming, Colorado, Utah, and Nebraska for Residents of Wyoming ZIP Code 82001 by Disease Specialty Area, 2003

Disease Specialty	Total (100%)	# of discharges in WY	Percent	# of discharges in CO	Percent	# of discharges in UT	Percent	# of discharges in NE	Percent
Cardiology	194	183	94.3%	7	3.6%	2	1.0%	2	1.0%
Dentistry	5	5	100.0%	0	0.0%	0	0.0%	0	0.0%
Dermatology	4	2	50.0%	2	50.0%	0	0.0%	0	0.0%
Endocrine	94	93	98.9%	1	1.1%	0	0.0%	0	0.0%
Gastroenterology	196	183	93.4%	12	6.1%	0	0.0%	1	0.5%
General Medicine	61	54	88.5%	7	11.5%	0	0.0%	0	0.0%
General Surgery	232	175	75.4%	48	20.7%	4	1.7%	5	2.2%
Gynecology	136	122	89.7%	14	10.3%	0	0.0%	0	0.0%
Hematology	30	23	76.7%	7	23.3%	0	0.0%	0	0.0%
Neonatology	123	100	81.3%	23	18.7%	0	0.0%	0	0.0%
Nephrology	44	40	90.9%	4	9.1%	0	0.0%	0	0.0%
Neurology	66	58	87.9%	8	12.1%	0	0.0%	0	0.0%
Neurosurgery	39	21	53.8%	18	46.2%	0	0.0%	0	0.0%
Normal Newborns	467	449	96.1%	17	3.6%	1	0.2%	0	0.0%
Obstetrics	623	588	94.4%	34	5.5%	1	0.2%	0	0.0%
Oncology	33	25	75.8%	8	24.2%	0	0.0%	0	0.0%
Ophthalmology	2	2	100.0%	0	0.0%	0	0.0%	0	0.0%
Orthopedics	217	168	77.4%	49	22.6%	0	0.0%	0	0.0%
Otolaryngology	52	46	88.5%	5	9.6%	1	1.9%	0	0.0%
Psychiatry	188	172	91.5%	14	7.4%	1	0.5%	1	0.5%
Pulmonary	257	240	93.4%	17	6.6%	0	0.0%	0	0.0%
Rheumatology	8	8	100.0%	0	0.0%	0	0.0%	0	0.0%
Thoracic Surgery	43	34	79.1%	9	20.9%	0	0.0%	0	0.0%
Urology	61	55	90.2%	6	9.8%	0	0.0%	0	0.0%
Vascular Surgery	21	16	76.2%	5	23.8%	0	0.0%	0	0.0%
Other	15	12	80.0%	3	20.0%	0	0.0%	0	0.0%

Source: Healthcare Cost and Utilization Project State Inpatient Sample, 2003; Wyoming hospital discharge data set from the Wyoming Hospital Association, 2003.

Note: The highlighted areas are the disease specialty areas for which Wyoming hospitals had a market share between 30% and 85%, assuming that the denominator of the market share (i.e., 100%) only includes discharges in four states (Wyoming, Colorado, Utah, and Nebraska).

Table 6.6. Distribution of Hospital Discharges Among Hospitals of Wyoming, Colorado, Utah, and Nebraska for Residents of Wyoming ZIP Code 82009 by Disease Specialty Area, 2003

Disease Specialty	Total (100%)	# of discharges in WY	Percent	# of discharges in CO	Percent	# of discharges in UT	Percent	# of discharges in NE	Percent
Cardiology	146	134	91.8%	12	8.2%	0	0.0%	0	0.0%
Dentistry	2	2	100.0%	0	0.0%	0	0.0%	0	0.0%
Dermatology	1	1	100.0%	0	0.0%	0	0.0%	0	0.0%
Endocrine	60	56	93.3%	3	5.0%	1	1.7%	0	0.0%
Gastroenterology	163	146	89.6%	17	10.4%	0	0.0%	0	0.0%
General Medicine	47	37	78.7%	8	17.0%	2	4.3%	0	0.0%
General Surgery	179	127	70.9%	50	27.9%	1	0.6%	1	0.6%
Gynecology	135	121	89.6%	14	10.4%	0	0.0%	0	0.0%
Hematology	13	12	92.3%	1	7.7%	0	0.0%	0	0.0%
Neonatology	69	55	79.7%	14	20.3%	0	0.0%	0	0.0%
Nephrology	35	31	88.6%	4	11.4%	0	0.0%	0	0.0%
Neurology	45	35	77.8%	9	20.0%	1	2.2%	0	0.0%
Neurosurgery	19	10	52.6%	8	42.1%	1	5.3%	0	0.0%
Normal Newborns	197	189	95.9%	7	3.6%	1	0.5%	0	0.0%
Obstetrics	290	262	90.3%	27	9.3%	1	0.3%	0	0.0%
Oncology	50	30	60.0%	20	40.0%	0	0.0%	0	0.0%
Ophthalmology	3	3	100.0%	0	0.0%	0	0.0%	0	0.0%
Orthopedics	211	154	73.0%	55	26.1%	2	0.9%	0	0.0%
Otolaryngology	48	43	89.6%	5	10.4%	0	0.0%	0	0.0%
Psychiatry	93	80	86.0%	11	11.8%	1	1.1%	1	1.1%
Pulmonary	171	165	96.5%	6	3.5%	0	0.0%	0	0.0%
Rheumatology	1	0	0.0%	1	100.0%	0	0.0%	0	0.0%
Thoracic Surgery	42	31	73.8%	11	26.2%	0	0.0%	0	0.0%
Urology	73	61	83.6%	8	11.0%	4	5.5%	0	0.0%
Vascular Surgery	17	9	52.9%	7	41.2%	1	5.9%	0	0.0%
Other	7	6	85.7%	0	0.0%	1	14.3%	0	0.0%

Source: Healthcare Cost and Utilization Project State Inpatient Sample, 2003; Wyoming hospital discharge data set from the Wyoming Hospital Association, 2003.

Note: The highlighted areas are the disease specialty areas for which Wyoming hospitals had a market share between 30% and 85%, assuming that the denominator of the market share (i.e., 100%) only includes discharges in four states (Wyoming, Colorado, Utah, and Nebraska).

Table 6.7. Distribution of Hospital Discharges Among Hospitals of Wyoming, Colorado, Utah, and Nebraska for Residents of Wyoming ZIP Code 82070 by Disease Specialty Area, 2003

Disease Specialty	Total (100%)	# of discharges in WY	Percent	# of discharges in CO	Percent	# of discharges in UT	Percent	# of discharges in NE	Percent
Cardiology	53	41	77.4%	12	22.6%	0	0.0%	0	0.0%
Dentistry	0	0	-	0	-	0	-	0	-
Dermatology	0	0	-	0	-	0	-	0	-
Endocrine	14	14	100.0%	0	0.0%	0	0.0%	0	0.0%
Gastroenterology	54	41	75.9%	13	24.1%	0	0.0%	0	0.0%
General Medicine	25	14	56.0%	11	44.0%	0	0.0%	0	0.0%
General Surgery	72	57	79.2%	15	20.8%	0	0.0%	0	0.0%
Gynecology	46	37	80.4%	9	19.6%	0	0.0%	0	0.0%
Hematology	4	4	100.0%	0	0.0%	0	0.0%	0	0.0%
Neonatology	48	41	85.4%	7	14.6%	0	0.0%	0	0.0%
Nephrology	20	15	75.0%	5	25.0%	0	0.0%	0	0.0%
Neurology	31	23	74.2%	6	19.4%	2	6.5%	0	0.0%
Neurosurgery	19	4	21.1%	14	73.7%	1	5.3%	0	0.0%
Normal Newborns	130	126	96.9%	4	3.1%	0	0.0%	0	0.0%
Obstetrics	190	178	93.7%	12	6.3%	0	0.0%	0	0.0%
Oncology	16	8	50.0%	8	50.0%	0	0.0%	0	0.0%
Ophthalmology	2	1	50.0%	1	50.0%	0	0.0%	0	0.0%
Orthopedics	99	57	57.6%	41	41.4%	1	1.0%	0	0.0%
Otolaryngology	14	11	78.6%	3	21.4%	0	0.0%	0	0.0%
Psychiatry	62	61	98.4%	1	1.6%	0	0.0%	0	0.0%
Pulmonary	94	90	95.7%	4	4.3%	0	0.0%	0	0.0%
Rheumatology	3	3	100.0%	0	0.0%	0	0.0%	0	0.0%
Thoracic Surgery	23	7	30.4%	16	69.6%	0	0.0%	0	0.0%
Urology	18	11	61.1%	7	38.9%	0	0.0%	0	0.0%
Vascular Surgery	8	2	25.0%	6	75.0%	0	0.0%	0	0.0%
Other	4	4	100.0%	0	0.0%	0	0.0%	0	0.0%

Source: Healthcare Cost and Utilization Project State Inpatient Sample, 2003; Wyoming hospital discharge data set from the Wyoming Hospital Association, 2003.

Note: The highlighted areas are the disease specialty areas for which Wyoming hospitals had a market share between 30% and 85%, assuming that the denominator of the market share (i.e., 100%) only includes discharges in four states (Wyoming, Colorado, Utah, and Nebraska).

Table 6.8. Distribution of Hospital Discharges Among Hospitals of Wyoming, Colorado, Utah, and Nebraska for Residents of Wyoming ZIP Code 82007 by Disease Specialty Area, 2003

Disease Specialty	Total (100%)	# of discharges in WY	Percent	# of discharges in CO	Percent	# of discharges in UT	Percent	# of discharges in NE	Percent
Cardiology	94	85	90.4%	7	7.4%	2	2.1%	0	0.0%
Dentistry	2	1	50.0%	0	0.0%	0	0.0%	1	50.0%
Dermatology	0	0	-	0	-	0	-	0	-
Endocrine	55	54	98.2%	1	1.8%	0	0.0%	0	0.0%
Gastroenterology	80	77	96.3%	3	3.8%	0	0.0%	0	0.0%
General Medicine	32	25	78.1%	6	18.8%	1	3.1%	0	0.0%
General Surgery	106	79	74.5%	26	24.5%	1	0.9%	0	0.0%
Gynecology	56	53	94.6%	3	5.4%	0	0.0%	0	0.0%
Hematology	10	10	100.0%	0	0.0%	0	0.0%	0	0.0%
Neonatology	60	49	81.7%	11	18.3%	0	0.0%	0	0.0%
Nephrology	16	16	100.0%	0	0.0%	0	0.0%	0	0.0%
Neurology	40	36	90.0%	4	10.0%	0	0.0%	0	0.0%
Neurosurgery	17	6	35.3%	11	64.7%	0	0.0%	0	0.0%
Normal Newborns	210	199	94.8%	11	5.2%	0	0.0%	0	0.0%
Obstetrics	278	258	92.8%	20	7.2%	0	0.0%	0	0.0%
Oncology	9	4	44.4%	5	55.6%	0	0.0%	0	0.0%
Ophthalmology	0	0	-	0	-	0	-	0	-
Orthopedics	97	72	74.2%	24	24.7%	1	1.0%	0	0.0%
Otolaryngology	29	28	96.6%	1	3.4%	0	0.0%	0	0.0%
Psychiatry	78	66	84.6%	12	15.4%	0	0.0%	0	0.0%
Pulmonary	170	162	95.3%	7	4.1%	0	0.0%	1	0.6%
Rheumatology	0	0	-	0	-	0	-	0	-
Thoracic Surgery	19	11	57.9%	8	42.1%	0	0.0%	0	0.0%
Urology	34	32	94.1%	2	5.9%	0	0.0%	0	0.0%
Vascular Surgery	12	7	58.3%	5	41.7%	0	0.0%	0	0.0%
Other	2	2	100.0%	0	0.0%	0	0.0%	0	0.0%

Source: Healthcare Cost and Utilization Project State Inpatient Sample, 2003; Wyoming hospital discharge data set from the Wyoming Hospital Association, 2003.

Note: The highlighted areas are the disease specialty areas for which Wyoming hospitals had a market share between 30% and 85%, assuming that the denominator of the market share (i.e., 100%) only includes discharges in four states (Wyoming, Colorado, Utah, and Nebraska).

Table 6.9. Distribution of Hospital Discharges Among Hospitals of Wyoming, Colorado, Utah, and Nebraska for Residents of Wyoming ZIP Code 82072 by Disease Specialty Area, 2003

Disease Specialty	Total (100%)	# of discharges in WY	Percent	# of discharges in CO	Percent	# of discharges in UT	Percent	# of discharges in NE	Percent
Cardiology	37	22	59.5%	15	40.5%	0	0.0%	0	0.0%
Dentistry	1	1	100.0%	0	0.0%	0	0.0%	0	0.0%
Dermatology	1	1	100.0%	0	0.0%	0	0.0%	0	0.0%
Endocrine	7	7	100.0%	0	0.0%	0	0.0%	0	0.0%
Gastroenterology	36	32	88.9%	3	8.3%	0	0.0%	1	2.8%
General Medicine	18	16	88.9%	2	11.1%	0	0.0%	0	0.0%
General Surgery	49	31	63.3%	18	36.7%	0	0.0%	0	0.0%
Gynecology	26	18	69.2%	8	30.8%	0	0.0%	0	0.0%
Hematology	4	3	75.0%	1	25.0%	0	0.0%	0	0.0%
Neonatology	47	38	80.9%	9	19.1%	0	0.0%	0	0.0%
Nephrology	12	10	83.3%	2	16.7%	0	0.0%	0	0.0%
Neurology	25	18	72.0%	7	28.0%	0	0.0%	0	0.0%
Neurosurgery	5	1	20.0%	4	80.0%	0	0.0%	0	0.0%
Normal Newborns	131	127	96.9%	4	3.1%	0	0.0%	0	0.0%
Obstetrics	205	191	93.2%	14	6.8%	0	0.0%	0	0.0%
Oncology	5	2	40.0%	2	40.0%	1	20.0%	0	0.0%
Ophthalmology	0	0	-	0	-	0	-	0	-
Orthopedics	48	26	54.2%	22	45.8%	0	0.0%	0	0.0%
Otolaryngology	6	5	83.3%	1	16.7%	0	0.0%	0	0.0%
Psychiatry	65	64	98.5%	1	1.5%	0	0.0%	0	0.0%
Pulmonary	103	99	96.1%	4	3.9%	0	0.0%	0	0.0%
Rheumatology	2	1	50.0%	1	50.0%	0	0.0%	0	0.0%
Thoracic Surgery	10	4	40.0%	6	60.0%	0	0.0%	0	0.0%
Urology	16	11	68.8%	5	31.3%	0	0.0%	0	0.0%
Vascular Surgery	10	1	10.0%	9	90.0%	0	0.0%	0	0.0%
Other	1	1	100.0%	0	0.0%	0	0.0%	0	0.0%

Source: Healthcare Cost and Utilization Project State Inpatient Sample, 2003; Wyoming hospital discharge data set from the Wyoming Hospital Association, 2003.

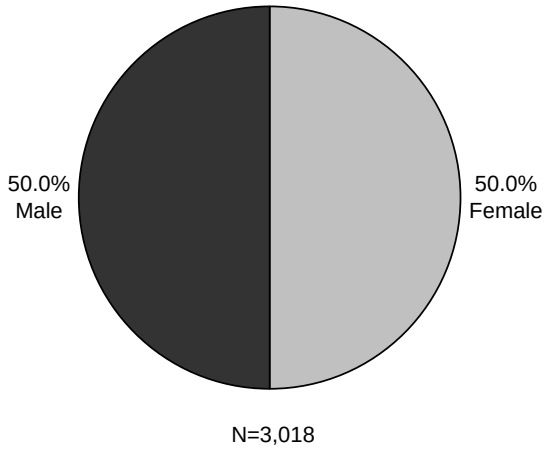
Note: The highlighted areas are the disease specialty areas for which Wyoming hospitals had a market share between 30% and 85%, assuming that the denominator of the market share (i.e., 100%) only includes discharges in four states (Wyoming, Colorado, Utah, and Nebraska).

Hospital Inpatient Out-migration from Wyoming to Utah

Profile of Wyoming Inpatients Out-migrating to Utah Hospitals

In 2003, a total of 3,019 Utah hospital discharges were contributed by Wyoming residents. These discharges constituted about 6.27% of the total discharges of Wyoming patients from hospitals in Wyoming, Colorado, Utah, and Nebraska (a total of 48,155 discharges) in the same year. Of the 3,019 out-migrating discharges, half (50%) were attributed to female patients, and more than one-fourth (26%) were attributed to elderly patients aged 65 or older (Figures 6.5 and 6.6). In addition, private insurance covered more than half of the out-migrating discharges (55%), and Medicare or Medicaid together covered about one-third (31.7%) (Figure 6.7). The top three disease specialty areas with the most out-migrating discharges were orthopedics (403 discharges; 15%), general surgery (366 discharges; 13%), and cardiology (212 discharges; 8%). The detailed distribution of the out-migrating discharges among different disease specialty areas is shown in Table 6.10. The top 10 Wyoming ZIP codes (along with the corresponding county names) where the most out-migrating discharges originated are listed in Table 6.11; ZIP code 82901 (in Sweetwater County) contributed the most out-migrating discharges to Utah.[61] In fact, the top five Wyoming ZIP codes with the most out-migrating discharges to Utah were located in Sweetwater County, Uinta County, or Lincoln County. [62]

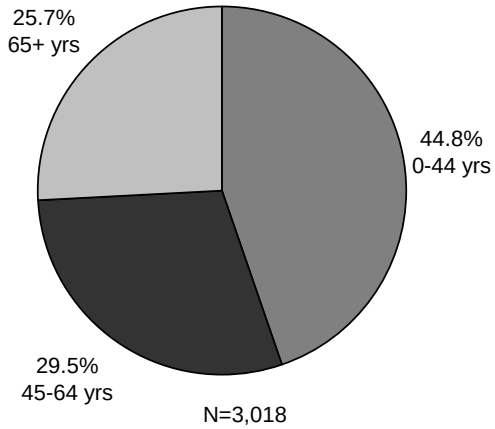
Figure 6.5. Gender Distribution of Wyoming's Out-migrating Inpatients to Utah Hospitals, 2003



Source: Healthcare Cost and Utilization Project State Inpatient Sample, 2003.

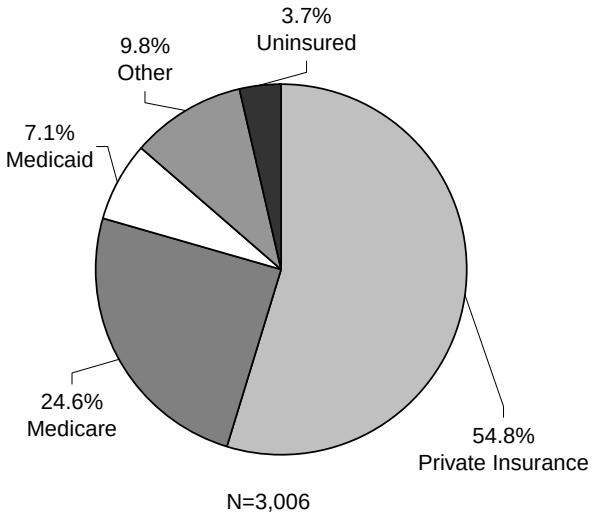
[61] See Appendix N for the detailed distribution of the out-migrating discharges to Utah among all Wyoming ZIP code areas.
[62] See Appendix O for the distribution of out-migrating hospital discharges from Wyoming to Utah by county of residence in Wyoming.

Figure 6.6. Age Distribution of Wyoming's Out-migrating Inpatients to Utah Hospitals, 2003



Source: Healthcare Cost and Utilization Project State Inpatient Sample, 2003.

Figure 6.7. Payer Type Distribution of Wyoming's Out-migrating Inpatients to Utah Hospitals, 2003



Source: Healthcare Cost and Utilization Project State Inpatient Sample, 2003.

Table 6.10. Wyoming's Out-migrating Inpatients to Utah Hospitals by Disease Specialty, Ranked Based on Number of Discharges, 2003

Disease Specialty	Number of Discharges	% Out of Total UT Discharges	% Out of WY Discharges
Orthopedics	403	14.7	10.0
General Surgery	366	13.3	9.5
Cardiology	212	7.7	5.5
Obstetrics	211	7.7	3.1
Thoracic Surgery	139	5.1	18.8
General Medicine	131	4.8	8.5
Neonatology	130	4.7	7.3
Neurosurgery	129	4.7	26.7
Gastroenterology	112	4.1	3.3
Normal Newborns	109	4.0	2.3
Pulmonary	107	3.9	2.4
Oncology	100	3.7	20.6
Neurology	91	3.3	8.0
Gynecology	90	3.3	4.9
Psychiatry	75	2.7	5.0
Urology	65	2.4	6.4
Vascular Surgery	56	2.0	17.5
Endocrine	47	1.7	3.3
Otolaryngology	40	1.5	5.2
Nephrology	36	1.3	5.1
Other	30	1.1	16.7
Hematology	29	1.1	9.2
Rheumatology	21	0.8	11.1
Dentistry	6	0.2	9.7
Dermatology	4	0.2	7.4
Ophthalmology	4	0.2	9.5
Total	**2743**	**100.0**	

Source: Healthcare Cost and Utilization Project State Inpatient Sample, 2003; Wyoming Hospital Association, 2003.

Table 6.11. Wyoming's Out-migrating Inpatients (to Utah Hospitals) by Top Ten ZIP Codes of Wyoming Residence, Ranked based on Number of Discharges, 2003

ZIP Codes	County	Number of Discharges	Percent
82901	Sweetwater	568	18.81
82930	Uinta	456	15.10
82935	Sweetwater	382	12.65
82937	Uinta	133	4.41
83101	Lincoln	123	4.07
83110	Lincoln	108	3.58
82939	Uinta	87	2.88
83001	Teton	78	2.58
82501	Fremont	71	2.35
82902	Sweetwater	70	2.32
Total		**2076**	**68.75**

Source: Healthcare Cost and Utilization Project State Inpatient Sample, 2003.

Financial Implication of Out-migration of Wyoming Inpatients to Utah Hospitals

Hospital Charge Incurred By Wyoming Patients in Utah Hospitals

The total charge incurred in Utah hospitals for all 3,019 out-migrating discharges from Wyoming was about $64 million ($64,268,975) in 2003. The average hospital charge was $22,978, with an average length of stay of 5.8 days. The hospital charge associated with the inpatient out-migration from Wyoming to Utah is ranked by disease specialty area in Table 6.12 (i.e., the unadjusted charges). The top three specialty areas with the most incurred hospital charge due to inpatient out-migration were orthopedics ($9,002,590), general surgery ($8,068,459), and thoracic surgery ($7,191,165).

Table 6.12. Hospital Charges Associated With Inpatient Out-migration From Wyoming to Utah by Disease Specialty, Ranked Based on Unadjusted Charges,* 2003

Disease Specialty	Unadjusted Charges	Adjusted Charges**
Orthopedics	$9,002,590	$10,884,644
General Surgery	$8,068,459	$8,336,053
Thoracic Surgery	$7,191,165	$7,338,240
Neonatology	$6,802,283	$3,274,507
Oncology	$4,005,367	$2,507,370
Cardiology	$3,514,897	$3,022,311
Neurosurgery	$3,076,411	$3,365,740
General Medicine	$2,696,976	$2,305,470
Pulmonary	$1,814,328	$1,625,445
Obstetrics	$1,451,815	$1,558,152
Urology	$1,429,336	$1,466,601
Vascular Surgery	$1,289,259	$1,430,191
Gastroenterology	$1,258,580	$1,111,143
Gynecology	$987,415	$1,262,934
Neurology	$893,720	$855,231
Other	$876,131	$923,151
Psychiatry	$760,584	$766,848
Nephrology	$567,285	$475,446
Otolaryngology	$327,599	$263,641
Hematology	$301,098	$260,086
Endocrine	$286,008	$242,858
Rheumatology	$238,660	$224,032
Normal Newborns	$120,699	$134,097
Dentistry	$53,806	$50,544
Ophthalmology	$29,279	$25,829
Dermatology	$19,442	$16,941
Unknown***	$7,205,783	$6,550,712
Total	**$64,268,975**	**$60,278,217**

Source: Healthcare Cost and Utilization Project State Inpatient Sample, 2003; Wyoming hospital discharge data set from the Wyoming Hospital Association, 2003.

*Unadjusted charge figures come from Utah hospital discharge data.
**Adjusted charge figures were simulated charge estimates that may have been incurred if the out-migrating patients had received care within Wyoming hospitals.
***Adjusted charge for unknown was calculated based on average charge per day ratio of all disease specialties.

Simulated Lost Hospital Charge and Revenue for Wyoming Hospitals Due to Inpatient Out-migration to Utah

The total potential lost hospital charges for Wyoming hospitals due to inpatient out-migration to Utah were estimated at $60 million ($60,278,217, based on 3,019 discharges) in 2003 and ranked by disease specialty area in Table 6.13 (i.e., the adjusted charges). The top three specialty areas with the most estimated lost hospital charges due to inpatient out-migration to Utah were orthopedics ($10,884,644), general surgery ($8,336,053), and thoracic surgery ($7,338,240). These results are quite similar to those based on hospital charges incurred by Wyoming patients in Utah hospitals.

Table 6.13. Hospital Charges Associated With Inpatient Out-migration From Wyoming to Utah by Disease Specialty, Ranked Based on Adjusted Charges, 2003**

Disease Specialty	Unadjusted Charges*	Adjusted Charges
Orthopedics	$9,002,590	$10,884,644
General Surgery	$8,068,459	$8,336,053
Thoracic Surgery	$7,191,165	$7,338,240
Neurosurgery	$3,076,411	$3,365,740
Neonatology	$6,802,283	$3,274,507
Cardiology	$3,514,897	$3,022,311
Oncology	$4,005,367	$2,507,370
General Medicine	$2,696,976	$2,305,470
Pulmonary	$1,814,328	$1,625,445
Obstetrics	$1,451,815	$1,558,152
Urology	$1,429,336	$1,466,601
Vascular Surgery	$1,289,259	$1,430,191
Gynecology	$987,415	$1,262,934
Gastroenterology	$1,258,580	$1,111,143
Other	$876,131	$923,151
Neurology	$893,720	$855,231
Psychiatry	$760,584	$766,848
Nephrology	$567,285	$475,446
Otolaryngology	$327,599	$263,641
Hematology	$301,098	$260,086
Endocrine	$286,008	$242,858
Rheumatology	$238,660	$224,032
Normal Newborns	$120,699	$134,097
Dentistry	$53,806	$50,544
Ophthalmology	$29,279	$25,829
Dermatology	$19,442	$16,941
Unknown***	$7,205,783	$6,550,712
Total	**$64,268,975**	**$60,278,217**

Source: Healthcare Cost and Utilization Project State Inpatient Sample, 2003; Wyoming hospital discharge data set from the Wyoming Hospital Association, 2003.

*Unadjusted charge figures come from Utah hospital discharge data.
**Adjusted charge figures were simulated charge estimates that may have been incurred if the out-migrating patients had received care within Wyoming hospitals.
***Adjusted charge for unknown was calculated based on average charge per day ratio of all disease specialties.

The total potential lost revenue for Wyoming hospitals due to inpatient out-migration to Utah was estimated at $42 million ($42,194,752) in 2003.[63] Based on our economic impact analysis, for each $1.00 less spent in Wyoming hospitals, an average of $0.32 less will be spent in other economic sectors of Wyoming's communities.[64] If we use the estimated lost hospital revenue due to inpatient out-migration as a proxy for economic output, then we can estimate that about $13.5 million ($13,502,321) less was spent in other economic sectors of Wyoming's communities due to hospital inpatient out-migration to Utah in 2003.

Hospital Charge and Revenue Estimates After Excluding Justifiable Inpatient Out-migration to Utah Hospitals

Because the HSAs for the residents of five Wyoming ZIP codes were actually in Utah,[65] the out-migrating discharges originating from these five ZIP codes were theoretically "justifiable" and thus may need to be excluded from the estimation of the financial impact due to inpatient out-migration. Table 6.14 shows the out-migrating discharges from these five Wyoming ZIP codes. A total of 27 discharges (0.9% of the total out-migrating discharges from Wyoming to Utah) were justifiable. After excluding these 27 discharges, we re-estimated the total charges incurred by out-migrating discharges in Utah hospitals at $63,911,042, the total potential lost hospital charges for Wyoming hospitals at $59,924,181, and the total potential lost revenue for Wyoming hospitals at $41,946,927 in 2003 (based on a total of 2,992 discharges).

Table 6.14. Out-migrating Discharges Originating From Wyoming ZIP Codes With Hospital Service Areas* in Utah

ZIP Codes	County	Number of Discharges	Percent
83114	Lincoln	21	77.78
82321	Carbon	2	7.41
82323	Carbon	2	7.41
82190	Park	1	3.70
82712	Crook	1	3.70
Total		**27**	**100.00**

Source: Healthcare Cost and Utilization Project State Inpatient Sample, 2003.

*Based on the Dartmouth Atlas of Health Care.

Market Share Analysis for the Top Five Wyoming ZIP Codes with the Most Out-migrating Discharges to Utah Hospitals

Although we estimated the potential lost revenue for Wyoming hospitals due to inpatient out-migration to Utah at $42 million, not all of this revenue can be recaptured by Wyoming hospitals. As with Colorado, we assumed that if Wyoming hospitals already had a market share

[63] We used the 50th percentile percentage of reductions from gross revenue for Wyoming hospitals in 2003 (i.e., 30%) from *The Comparative Performance of U.S. Hospitals: The 2006 Sourcebook* (2006, Evanston, IL: Solucient, LLC) to estimate the revenue associated with the total potential lost hospital charges for Wyoming hospitals due to inpatient out-migration to Utah.

[64] We used the average hospital-sector multiplier for economic output (1.32) obtained from our county-level economic impact analysis for Wyoming's health care sector.

[65] Based on the Hospital Service Areas defined by the Dartmouth Atlas of Health Care.

(for a certain type of disease specialty area) in the middle range (e.g., somewhere between 30% and 85%), then it would be feasible for them to recapture some of the lost business due to inpatient out-migration to Utah. Based on this assumption, we identified the specialty areas for which Wyoming hospitals may be able to recapture some of the lost business in the top five ZIP codes with the most out-migrating discharges to Utah (the highlighted specialty areas shown in Tables 6.15-6.19). However, these results are based on proxy estimates of market share given that hospital discharge data are available for only Wyoming and three neighboring states (Colorado, Utah, and Nebraska), so the results may be more reliable if a ZIP code of interest is geographically closer to the border between Wyoming and the three neighboring states.[66] Based on the map shown in Appendix M, all five ZIP codes for which data are shown in Tables 6.15-6.19 are located close to the border among Wyoming, Utah, and Colorado (especially ZIP codes 82901, 82930, and 82937). Therefore, the results of the identified specialty areas with a potential for Wyoming hospitals to recapture some of the lost business may be more reliable for these five ZIP codes, given their geographic proximity to the state's border.

[66] Due to the data availability, we assumed that the denominator of the market shares (i.e., 100%) includes only the hospital discharges distributed among the hospitals of the four states (Wyoming, Colorado, Utah, and Nebraska). Therefore, the closer to the state's border a ZIP code area of interest is, the stronger this assumption holds true.

Table 6.15. Distribution of Hospital Discharges Among Hospitals of Wyoming, Colorado, Utah, and Nebraska for Residents of Wyoming ZIP Code 82901 by Disease Specialty Area, 2003

Disease Specialty	Total (100%)	# of discharges in WY	Percent	# of discharges in CO	Percent	# of discharges in UT	Percent	# of discharges in NE	Percent
Cardiology	191	142	74.3%	0	0.0%	49	25.7%	0	0.0%
Dentistry	3	0	0.0%	0	0.0%	3	100.0%	0	0.0%
Dermatology	1	1	100.0%	0	0.0%	0	0.0%	0	0.0%
Endocrine	51	40	78.4%	1	2.0%	10	19.6%	0	0.0%
Gastroenterology	87	66	75.9%	0	0.0%	19	21.8%	2	2.3%
General Medicine	59	33	55.9%	1	1.7%	25	42.4%	0	0.0%
General Surgery	129	69	53.5%	4	3.1%	56	43.4%	0	0.0%
Gynecology	73	50	68.5%	0	0.0%	23	31.5%	0	0.0%
Hematology	14	9	64.3%	0	0.0%	5	35.7%	0	0.0%
Neonatology	99	68	68.7%	1	1.0%	30	30.3%	0	0.0%
Nephrology	17	15	88.2%	0	0.0%	2	11.8%	0	0.0%
Neurology	42	26	61.9%	2	4.8%	14	33.3%	0	0.0%
Neurosurgery	34	2	5.9%	0	0.0%	32	94.1%	0	0.0%
Normal Newborns	251	234	93.2%	0	0.0%	17	6.8%	0	0.0%
Obstetrics	353	320	90.7%	1	0.3%	32	9.1%	0	0.0%
Oncology	25	4	16.0%	0	0.0%	21	84.0%	0	0.0%
Ophthalmology	0	0	-	0	-	0	-	0	-
Orthopedics	140	75	53.6%	1	0.7%	64	45.7%	0	0.0%
Otolaryngology	30	25	83.3%	1	3.3%	4	13.3%	0	0.0%
Psychiatry	45	35	77.8%	0	0.0%	10	22.2%	0	0.0%
Pulmonary	159	140	88.1%	0	0.0%	19	11.9%	0	0.0%
Rheumatology	24	2	8.3%	0	0.0%	22	91.7%	0	0.0%
Thoracic Surgery	5	4	80.0%	0	0.0%	1	20.0%	0	0.0%
Urology	58	29	50.0%	1	1.7%	27	46.6%	1	1.7%
Vascular Surgery	10	4	40.0%	0	0.0%	6	60.0%	0	0.0%
Other	17	8	47.1%	0	0.0%	9	52.9%	0	0.0%

Source: Healthcare Cost and Utilization Project State Inpatient Sample, 2003; Wyoming hospital discharge data set from the Wyoming Hospital Association, 2003.

Note: The highlighted areas are the disease specialty areas for which Wyoming hospitals had a market share between 30% and 85%, assuming that the denominator of the market share (i.e., 100%) only includes discharges in four states (Wyoming, Colorado, Utah, and Nebraska).

Table 6.16. Distribution of Hospital Discharges Among Hospitals of Wyoming, Colorado, Utah, and Nebraska for Residents of Wyoming ZIP Code 82930 by Disease Specialty Area, 2003

Disease Specialty	Total (100%)	# of discharges in WY	Percent	# of discharges in CO	Percent	# of discharges in UT	Percent	# of discharges in NE	Percent
Cardiology	92	61	66.3%	1	1.1%	30	32.6%	0	0.0%
Dentistry	0	0	-	0	-	0	-	0	-
Dermatology	1	1	100.0%	0	0.0%	0	0.0%	0	0.0%
Endocrine	36	30	83.3%	0	0.0%	6	16.7%	0	0.0%
Gastroenterology	84	60	71.4%	1	1.2%	23	27.4%	0	0.0%
General Medicine	44	27	61.4%	1	2.3%	16	36.4%	0	0.0%
General Surgery	126	74	58.7%	1	0.8%	51	40.5%	0	0.0%
Gynecology	67	51	76.1%	0	0.0%	16	23.9%	0	0.0%
Hematology	9	2	22.2%	0	0.0%	7	77.8%	0	0.0%
Neonatology	72	47	65.3%	0	0.0%	25	34.7%	0	0.0%
Nephrology	20	13	65.0%	0	0.0%	7	35.0%	0	0.0%
Neurology	21	14	66.7%	0	0.0%	7	33.3%	0	0.0%
Neurosurgery	16	0	0.0%	0	0.0%	16	100.0%	0	0.0%
Normal Newborns	155	127	81.9%	0	0.0%	28	18.1%	0	0.0%
Obstetrics	224	177	79.0%	0	0.0%	47	21.0%	0	0.0%
Oncology	21	1	4.8%	0	0.0%	20	95.2%	0	0.0%
Ophthalmology	1	1	100.0%	0	0.0%	0	0.0%	0	0.0%
Orthopedics	76	23	30.3%	0	0.0%	53	69.7%	0	0.0%
Otolaryngology	17	15	88.2%	0	0.0%	2	11.8%	0	0.0%
Psychiatry	11	2	18.2%	0	0.0%	8	72.7%	1	9.1%
Pulmonary	110	101	91.8%	0	0.0%	9	8.2%	0	0.0%
Rheumatology	25	3	12.0%	0	0.0%	22	88.0%	0	0.0%
Thoracic Surgery	5	3	60.0%	0	0.0%	2	40.0%	0	0.0%
Urology	26	13	50.0%	0	0.0%	13	50.0%	0	0.0%
Vascular Surgery	14	0	0.0%	1	7.1%	13	92.9%	0	0.0%
Other	12	2	16.7%	0	0.0%	10	83.3%	0	0.0%

Source: Healthcare Cost and Utilization Project State Inpatient Sample, 2003; Wyoming hospital discharge data set from the Wyoming Hospital Association, 2003.

Note: The highlighted areas are the disease specialty areas for which Wyoming hospitals had a market share between 30% and 85%, assuming that the denominator of the market share (i.e., 100%) only includes discharges in four states (Wyoming, Colorado, Utah, and Nebraska).

Table 6.17. Distribution of Hospital Discharges Among Hospitals of Wyoming, Colorado, Utah, and Nebraska for Residents of Wyoming ZIP Code 82935 by Disease Specialty Area, 2003

Disease Specialty	Total (100%)	# of discharges in WY	Percent	# of discharges in CO	Percent	# of discharges in UT	Percent	# of discharges in NE	Percent
Cardiology	106	70	66.0%	1	0.9%	35	33.0%	0	0.0%
Dentistry	0	0	-	0	-	0	-	0	-
Dermatology	0	0	-	0	-	0	-	0	-
Endocrine	19	15	78.9%	0	0.0%	4	21.1%	0	0.0%
Gastroenterology	59	46	78.0%	0	0.0%	13	22.0%	0	0.0%
General Medicine	45	23	51.1%	0	0.0%	22	48.9%	0	0.0%
General Surgery	86	36	41.9%	3	3.5%	46	53.5%	1	1.2%
Gynecology	36	24	66.7%	0	0.0%	12	33.3%	0	0.0%
Hematology	3	3	100.0%	0	0.0%	0	0.0%	0	0.0%
Neonatology	44	25	56.8%	0	0.0%	19	43.2%	0	0.0%
Nephrology	13	8	61.5%	0	0.0%	5	38.5%	0	0.0%
Neurology	33	21	63.6%	0	0.0%	12	36.4%	0	0.0%
Neurosurgery	21	2	9.5%	0	0.0%	19	90.5%	0	0.0%
Normal Newborns	135	128	94.8%	0	0.0%	7	5.2%	0	0.0%
Obstetrics	186	165	88.7%	0	0.0%	21	11.3%	0	0.0%
Oncology	10	3	30.0%	1	10.0%	6	60.0%	0	0.0%
Ophthalmology	1	0	0.0%	0	0.0%	1	100.0%	0	0.0%
Orthopedics	108	55	50.9%	3	2.8%	50	46.3%	0	0.0%
Otolaryngology	12	9	75.0%	0	0.0%	3	25.0%	0	0.0%
Psychiatry	20	13	65.0%	0	0.0%	7	35.0%	0	0.0%
Pulmonary	74	67	90.5%	2	2.7%	5	6.8%	0	0.0%
Rheumatology	18	2	11.1%	0	0.0%	16	88.9%	0	0.0%
Thoracic Surgery	7	6	85.7%	0	0.0%	1	14.3%	0	0.0%
Urology	30	9	30.0%	0	0.0%	21	70.0%	0	0.0%
Vascular Surgery	11	1	9.1%	1	9.1%	9	81.8%	0	0.0%
Other	14	7	50.0%	0	0.0%	7	50.0%	0	0.0%

Source: Healthcare Cost and Utilization Project State Inpatient Sample, 2003; Wyoming hospital discharge data set from the Wyoming Hospital Association, 2003.

Note: The highlighted areas are the disease specialty areas for which Wyoming hospitals had a market share between 30% and 85%, assuming that the denominator of the market share (i.e., 100%) only includes discharges in four states (Wyoming, Colorado, Utah, and Nebraska).

Table 6.18. Distribution of Hospital Discharges Among Hospitals of Wyoming, Colorado, Utah, and Nebraska for Residents of Wyoming ZIP Code 82937 by Disease Specialty Area, 2003

Disease Specialty	Total (100%)	# of discharges in WY	Percent	# of discharges in CO	Percent	# of discharges in UT	Percent	# of discharges in NE	Percent
Cardiology	23	14	60.9%	0	0.0%	9	39.1%	0	0.0%
Dentistry	0	0	-	0	-	0	-	0	-
Dermatology	0	0	-	0	-	0	-	0	-
Endocrine	4	3	75.0%	0	0.0%	1	25.0%	0	0.0%
Gastroenterology	21	15	71.4%	0	0.0%	6	28.6%	0	0.0%
General Medicine	9	4	44.4%	0	0.0%	5	55.6%	0	0.0%
General Surgery	19	10	52.6%	0	0.0%	9	47.4%	0	0.0%
Gynecology	10	5	50.0%	0	0.0%	5	50.0%	0	0.0%
Hematology	3	2	66.7%	0	0.0%	1	33.3%	0	0.0%
Neonatology	16	8	50.0%	0	0.0%	8	50.0%	0	0.0%
Nephrology	4	2	50.0%	0	0.0%	2	50.0%	0	0.0%
Neurology	4	1	25.0%	0	0.0%	3	75.0%	0	0.0%
Neurosurgery	1	0	0.0%	0	0.0%	1	100.0%	0	0.0%
Normal Newborns	28	21	75.0%	0	0.0%	7	25.0%	0	0.0%
Obstetrics	45	31	68.9%	0	0.0%	14	31.1%	0	0.0%
Oncology	6	0	0.0%	0	0.0%	6	100.0%	0	0.0%
Ophthalmology	1	0	0.0%	0	0.0%	1	100.0%	0	0.0%
Orthopedics	21	2	9.5%	1	4.8%	18	85.7%	0	0.0%
Otolaryngology	1	0	0.0%	0	0.0%	1	100.0%	0	0.0%
Psychiatry	8	4	50.0%	0	0.0%	4	50.0%	0	0.0%
Pulmonary	21	12	57.1%	0	0.0%	9	42.9%	0	0.0%
Rheumatology	4	0	0.0%	0	0.0%	4	100.0%	0	0.0%
Thoracic Surgery	0	0	-	0	-	0	-	0	-
Urology	5	2	40.0%	0	0.0%	3	60.0%	0	0.0%
Vascular Surgery	2	0	0.0%	0	0.0%	2	100.0%	0	0.0%
Other	2	0	0.0%	0	0.0%	2	100.0%	0	0.0%

Source: Healthcare Cost and Utilization Project State Inpatient Sample, 2003; Wyoming hospital discharge data set from the Wyoming Hospital Association, 2003.

Note: The highlighted areas are the disease specialty areas for which Wyoming hospitals had a market share between 30% and 85%, assuming that the denominator of the market share (i.e., 100%) only includes discharges in four states (Wyoming, Colorado, Utah, and Nebraska).

Table 6.19. Distribution of Hospital Discharges Among Hospitals of Wyoming, Colorado, Utah, and Nebraska for Residents of Wyoming ZIP Code 83101 by Disease Specialty Area, 2003

Disease Specialty	Total (100%)	# of discharges in WY	Percent	# of discharges in CO	Percent	# of discharges in UT	Percent	# of discharges in NE	Percent
Cardiology	12	1	8.3%	0	0.0%	11	91.7%	0	0.0%
Dentistry	1	1	100.0%	0	0.0%	0	0.0%	0	0.0%
Dermatology	0	0	-	0	-	0	-	0	-
Endocrine	11	10	90.9%	0	0.0%	1	9.1%	0	0.0%
Gastroenterology	18	11	61.1%	0	0.0%	7	38.9%	0	0.0%
General Medicine	7	3	42.9%	0	0.0%	4	57.1%	0	0.0%
General Surgery	19	11	57.9%	0	0.0%	8	42.1%	0	0.0%
Gynecology	10	8	80.0%	0	0.0%	2	20.0%	0	0.0%
Hematology	4	1	25.0%	0	0.0%	3	75.0%	0	0.0%
Neonatology	5	1	20.0%	0	0.0%	4	80.0%	0	0.0%
Nephrology	4	1	25.0%	0	0.0%	3	75.0%	0	0.0%
Neurology	10	1	10.0%	0	0.0%	9	90.0%	0	0.0%
Neurosurgery	8	3	37.5%	0	0.0%	5	62.5%	0	0.0%
Normal Newborns	17	12	70.6%	0	0.0%	5	29.4%	0	0.0%
Obstetrics	26	15	57.7%	0	0.0%	11	42.3%	0	0.0%
Oncology	3	0	0.0%	0	0.0%	3	100.0%	0	0.0%
Ophthalmology	0	0	-	0	-	0	-	0	-
Orthopedics	26	9	34.6%	0	0.0%	17	65.4%	0	0.0%
Otolaryngology	3	1	33.3%	0	0.0%	2	66.7%	0	0.0%
Psychiatry	4	0	0.0%	0	0.0%	4	100.0%	0	0.0%
Pulmonary	19	13	68.4%	0	0.0%	6	31.6%	0	0.0%
Rheumatology	1	0	0.0%	0	0.0%	1	100.0%	0	0.0%
Thoracic Surgery	4	0	0.0%	0	0.0%	4	100.0%	0	0.0%
Urology	5	2	40.0%	0	0.0%	3	60.0%	0	0.0%
Vascular Surgery	2	0	0.0%	0	0.0%	2	100.0%	0	0.0%
Other	2	2	100.0%	0	0.0%	0	0.0%	0	0.0%

Source: Healthcare Cost and Utilization Project State Inpatient Sample, 2003; Wyoming hospital discharge data set from the Wyoming Hospital Association, 2003.

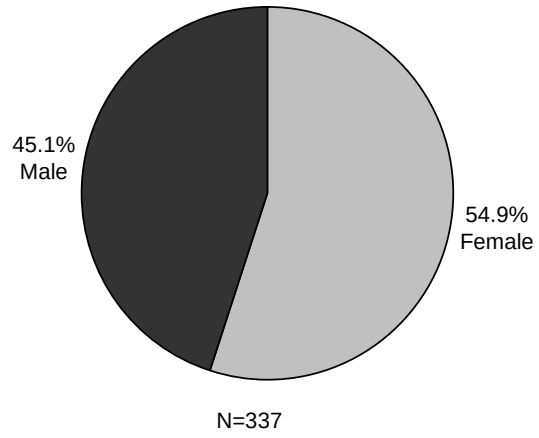
Note: The highlighted areas are the disease specialty areas for which Wyoming hospitals had a market share between 30% and 85%, assuming that the denominator of the market share (i.e., 100%) only includes discharges in four states (Wyoming, Colorado, Utah, and Nebraska).

Hospital Inpatient Out-migration from Wyoming to Nebraska

Profile of Wyoming Inpatients Out-migrating to Nebraska Hospitals

In 2003, a total of 337 Nebraska hospital discharges were contributed by Wyoming residents. These discharges constituted about 0.7% of the total discharges of Wyoming patients from hospitals in Wyoming, Colorado, Utah, and Nebraska (a total of 48,155 discharges) in the same year. Of the 337 out-migrating discharges, more than half (55%) were attributed to female patients, and three-fifths (60%) were attributed to elderly patients aged 65 or older (Figures 6.8 and 6.9). In addition, private insurance covered only 27% of the out-migrating discharges, and Medicare by itself covered more than two-thirds (69%) (Figure 6.10). The top three disease specialty areas with the most out-migrating discharges were general surgery (41 discharges; 12%), pulmonary (40 discharges; 12%), and orthopedics (38 discharges; 11%). The detailed distribution of the out-migrating discharges among different disease specialty areas is shown in Table 6.20. The top 10 Wyoming ZIP codes (along with the corresponding county names) where the most out-migrating discharges originated are listed in Table 6.21; ZIP code 82240 (in Goshen County) contributed the most out-migrating discharges to Nebraska (165 discharges or 49%).[67] In fact, the top five Wyoming ZIP codes with the most out-migrating discharges were located in Goshen County, Laramie County, or Niobrara County.[68]

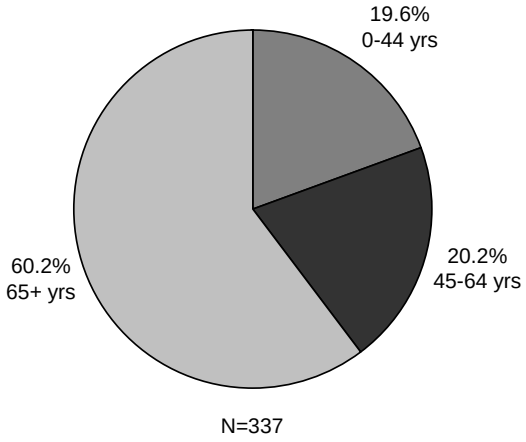
Figure 6.8. Gender Distribution of Wyoming's Out-migrating Inpatients to Nebraska Hospitals, 2003



Source: Nebraska Hospital Association, 2003.

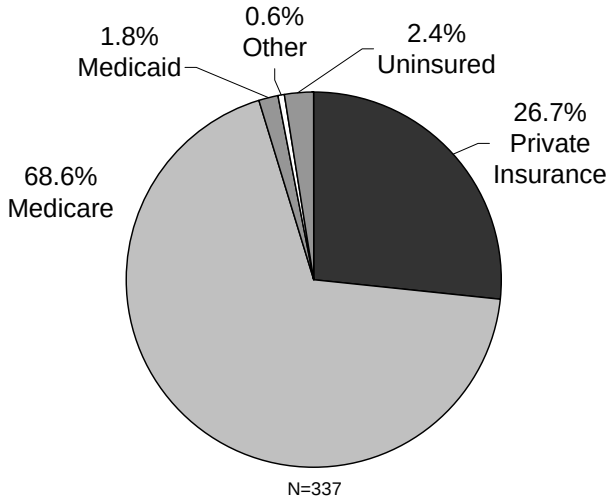
[67] See Appendix P for the detailed distribution of the out-migrating discharges to Nebraska among all Wyoming ZIP code areas.
[68] See Appendix Q for the distribution of out-migrating hospital discharges from Wyoming to Nebraska by county of residence in Wyoming.

Figure 6.9. Age Distribution of Wyoming's Out-migrating Inpatients to Nebraska Hospitals, 2003



Source: Nebraska Hospital Association, 2003.

Figure 6.10. Payer Type Distribution of Wyoming's Out-migrating Inpatients to Nebraska Hospitals, 2003



Source: Nebraska Hospital Association, 2003.

Table 6.20. Wyoming's Out-migrating Inpatients to Nebraska by Disease Specialty, Ranked Based on Number of Discharges, 2003

Disease Specialty	Number of Discharges	% Out of Total NE Discharges	% Out of WY Discharges
General Surgery	41	12.35	1.1
Pulmonary	40	12.05	0.9
Orthopedics	38	11.45	0.9
General Medicine	34	10.24	2.2
Cardiology	32	9.64	0.8
Gastroenterology	29	8.73	0.9
Oncology	14	4.22	2.9
Obstetrics	13	3.92	0.2
Neurology	12	3.61	1.0
Gynecology	10	3.01	0.5
Endocrine	9	2.71	0.6
Urology	9	2.71	0.9
Neurosurgery	8	2.41	1.7
Normal Newborns	8	2.41	0.2
Psychiatry	7	2.11	0.5
Nephrology	6	1.81	0.9
Hematology	5	1.51	1.6
Otolaryngology	5	1.51	0.6
Neonatology	3	0.9	0.2
Thoracic Surgery	3	0.9	0.4
Vascular Surgery	2	0.6	1.1
Other	2	0.6	0.6
Dentistry	1	0.3	1.6
Dermatology	1	0.3	1.9
Total	**332**	**100.0**	

Source: Nebraska Hospital Association, 2003.

Table 6.21. Wyoming's Out-migrating Inpatients (to Nebraska Hospitals) by Top Ten ZIP Codes of Wyoming Residence, Ranked based on Number of Discharges, 2003

ZIP Codes	County	Number of Discharges	Percent
82240	Goshen	165	48.96
82223	Goshen	23	6.82
82082	Laramie	17	5.04
82212	Goshen	16	4.75
82225	Niobrara	15	4.45
82243	Goshen	11	3.26
82001	Laramie	10	2.97
82221	Goshen	9	2.67
82217	Goshen	8	2.37
82003	Laramie	6	1.78
Total		**280**	**83.07**

Source: Nebraska Hospital Association, 2003.

Financial Implication of Out-migration of Wyoming Inpatients to Nebraska Hospitals

Hospital Charge Incurred By Wyoming Patients in Nebraska Hospitals

The total charge incurred in Nebraska hospitals for all 337 out-migrating discharges from Wyoming was about $5.2 million ($5,219,396) in 2003. The average hospital charge was $15,488, with an average length of stay of 4.6 days. The hospital charge associated with the inpatient out-migration from Wyoming to Nebraska is ranked by disease specialty area in Table 6.22 (i.e., the unadjusted charges). The top three specialty areas with the most incurred hospital charge due to inpatient out-migration were general surgery ($1,027,751), orthopedics ($861,141), and gastroenterology ($782,819).

Table 6.22. Hospital Charges Associated With Patient Out-migration From Wyoming to Nebraska by Subspecialty, Ranked Based on Unadjusted Charges,* 2003

Disease Specialty	Unadjusted Charges	Adjusted Charges**
General Surgery	$1,027,751	$907,474
Orthopedics	$861,141	$932,497
Gastroenterology	$782,819	$654,186
Pulmonary	$481,911	$410,478
General Medicine	$396,617	$360,732
Urology	$250,266	$216,614
Nephrology	$241,158	$205,172
Cardiology	$226,799	$188,933
Neurosurgery	$156,468	$138,662
Oncology	$140,108	$74,996
Neurology	$125,717	$123,464
Gynecology	$114,051	$112,748
Obstetrics	$81,241	$85,860
Vascular Surgery	$61,473	$55,798
Thoracic Surgery	$52,825	$44,337
Endocrine	$41,310	$35,882
Psychiatry	$35,521	$38,246
Hematology	$30,190	$22,619
Otolaryngology	$21,607	$18,225
Other	$20,704	$17,554
Normal Newborns	$11,344	$13,874
Neonatology	$9,020	$4,516
Dermatology	$7,727	$7,444
Dentistry	$4,447	$4,147
Ophthalmology	$0	$0
Rheumatology	$0	$0
Unknown***	$37,182	$31,779
Total	**$5,219,396**	**$4,706,235**

Source: Nebraska Hospital Association, 2003; Wyoming hospital discharge data set from the Wyoming Hospital Association, 2003.

*Unadjusted charge figures come from Nebraska hospital discharge data.
**Adjusted charge figures were simulated charge estimates that may have been incurred if the out-migrating patients had received care within Wyoming hospitals.
***Adjusted charge for unknown was calculated based on average charge per day ratio of all disease specialties.

Simulated Lost Hospital Charge and Revenue for Wyoming Hospitals Due to Inpatient Out-migration to Nebraska

The potential lost hospital charges for Wyoming hospitals due to inpatient out-migration to Nebraska was estimated at $4.7 million ($4,706,235, based on 337 discharges) in 2003 and is ranked by disease specialty area in Table 6.23 (i.e., the adjusted charges). The top three specialty areas with the most estimated lost hospital charges due to inpatient out-migration to Nebraska were orthopedics ($932,497), general surgery ($907,474), and gastroenterology ($654,186). These results are somewhat inconsistent with those based on hospital charges incurred by Wyoming patients in Nebraska hospitals.

Table 6.23. Hospital Charges Associated With Inpatient Out-migration From Wyoming to Nebraska by Disease Specialty, Ranked Based on Adjusted Charges, 2003**

Disease Specialty	Unadjusted Charges*	Adjusted Charges
Orthopedics	$861,141	$932,497
General Surgery	$1,027,751	$907,474
Gastroenterology	$782,819	$654,186
Pulmonary	$481,911	$410,478
General Medicine	$396,617	$360,732
Urology	$250,266	$216,614
Nephrology	$241,158	$205,172
Cardiology	$226,799	$188,933
Neurosurgery	$156,468	$138,662
Neurology	$125,717	$123,464
Gynecology	$114,051	$112,748
Obstetrics	$81,241	$85,860
Oncology	$140,108	$74,996
Vascular Surgery	$61,473	$55,798
Thoracic Surgery	$52,825	$44,337
Psychiatry	$35,521	$38,246
Endocrine	$41,310	$35,882
Hematology	$30,190	$22,619
Otolaryngology	$21,607	$18,225
Other	$20,704	$17,554
Normal Newborns	$11,344	$13,874
Dermatology	$7,727	$7,444
Neonatology	$9,020	$4,516
Dentistry	$4,447	$4,147
Ophthalmology	$0	$0
Rheumatology	$0	$0
Unknown***	$37,182	$31,779
Total	**$5,219,396**	**$4,706,235**

Source: Nebraska Hospital Association, 2003; Wyoming hospital discharge data set from the Wyoming Hospital Association, 2003.

*Unadjusted charge figures come from Nebraska hospital discharge data.
**Adjusted charge figures were simulated charge estimates that may have been incurred if the out-migrating patients had received care within Wyoming hospitals.
***Adjusted charge for unknown was calculated based on average charge per day ratio of all disease specialties.

The total potential lost revenue for Wyoming hospitals due to inpatient out-migration to Nebraska was estimated at $3.3 million ($3,294,365) in 2003.[69] Based on our economic impact analysis, for each $1.00 less spent in Wyoming hospitals, an average of $0.32 less will be spent in other economic sectors of Wyoming's communities.[70] If we use the estimated lost hospital revenue due to inpatient out-migration as a proxy for economic output, then we can estimate that about $1 million ($1,054,197) less was spent in other economic sectors of Wyoming's communities due to hospital inpatient out-migration to Nebraska in 2003.

Hospital Charge and Revenue Estimates After Excluding Justifiable Inpatient Out-migration to Nebraska Hospitals

Because the HSAs for the residents of three Wyoming ZIP codes were actually in Nebraska,[71] the out-migrating discharges originating from these three ZIP codes were theoretically "justifiable" and thus may need to be excluded from the estimation of the financial impact due to inpatient out-migration. Table 6.24 shows the out-migrating discharges from these three Wyoming ZIP codes. A total of four discharges (1.2% of the total out-migrating discharges from Wyoming to Nebraska) were justifiable. After excluding these four discharges, we re-estimated the total charges incurred by out-migrating discharges in Nebraska hospitals at $5,161,960, the total potential lost hospital charges for Wyoming hospitals at $4,656,851, and the total potential lost revenue for Wyoming hospitals at $3,259,796 in 2003 (based on 333 discharges).

Table 6.24. Out-migrating Discharges Originating From Wyoming ZIP Codes With Hospital Service Areas* in Nebraska

ZIP Codes	County	Number of Discharges	Percent
82219	Goshen	3	75.00
82222	Niobrara	1	25.00
82242	Niobrara	0	0.00
Total		**4**	**100.00**

Source: Nebraska Hospital Association, 2003.

*Based on the Dartmouth Atlas of Health Care.

Market Share Analysis for the Top Five Wyoming ZIP Codes with the Most Out-migrating Discharges to Nebraska Hospitals

Although we estimated the potential lost hospital revenues for Wyoming hospitals due to inpatient out-migration to Nebraska at $3.3 million, not all of this revenue can be recaptured by Wyoming hospitals. As with Colorado and Utah, we assumed that if Wyoming hospitals already had a market share (for a certain type of disease specialty area) in the middle range (e.g.,

[69] We used the 50th percentile percentage of reductions from gross revenue for Wyoming hospitals in 2003 (i.e., 30%) from *The Comparative Performance of U.S. Hospitals: The 2006 Sourcebook* (2006, Evanston, IL: Solucient, LLC) to estimate the revenue associated with the total potential lost hospital charges for Wyoming hospitals due to inpatient out-migration to Nebraska.

[70] We used the average hospital-sector multiplier for economic output (1.32) obtained from our county-level economic impact analysis for Wyoming's health care sector.

[71] Based on the Hospital Service Areas defined by the Dartmouth Atlas of Health Care.

somewhere between 30% and 85%), then it would be feasible for them to recapture some of the lost business due to inpatient out-migration. Based on this assumption, we identified the specialty areas for which some of the lost business may be recaptured by Wyoming hospitals for the top five ZIP codes with the most out-migrating discharges to Nebraska (the highlighted specialty areas shown in Tables 6.25-6.29). However, as with Colorado and Utah, these results are based on proxy estimates of market share given that the hospital discharge data are available for only Wyoming and the three neighboring states (Colorado, Nebraska, and Nebraska), so the results may be more reliable if a ZIP code of interest is geographically closer to the border between Wyoming and the three neighboring states.[72] Based on the map shown in Appendix M, all five ZIP codes for which data are shown in Tables 6.25-6.29 (except for ZIP code 82225, which is also close to South Dakota) are located close to the border between Wyoming and Nebraska and between Wyoming and Colorado. Therefore, the results of the identified specialty areas with a potential for Wyoming hospitals to recapture lost business may be relatively more reliable for these four ZIP codes (excluding ZIP code 82225).

[72] Due to the data availability, we assumed that the denominator of the market shares (i.e., 100%) includes only the hospital discharges distributed among the hospitals of the four states (Wyoming, Colorado, Utah, and Nebraska). Therefore, the closer to the state's border a ZIP code of interest is, the stronger this assumption holds true.

Table 6.25. Distribution of Hospital Discharges Among Hospitals of Wyoming, Colorado, Utah, and Nebraska for Residents of Wyoming ZIP Code 82240 by Disease Specialty Area, 2003

Disease Specialty	Total (100%)	# of discharges in WY	Percent	# of discharges in CO	Percent	# of discharges in UT	Percent	# of discharges in NE	Percent
Cardiology	105	86	81.9%	4	3.8%	0	0.0%	15	14.3%
Dentistry	2	2	100.0%	0	0.0%	0	0.0%	0	0.0%
Dermatology	2	1	50.0%	0	0.0%	0	0.0%	1	50.0%
Endocrine	60	59	98.3%	0	0.0%	0	0.0%	1	1.7%
Gastroenterology	122	110	90.2%	6	4.9%	0	0.0%	6	4.9%
General Medicine	90	68	75.6%	1	1.1%	0	0.0%	21	23.3%
General Surgery	91	58	63.7%	16	17.6%	1	1.1%	16	17.6%
Gynecology	23	16	69.6%	2	8.7%	0	0.0%	5	21.7%
Hematology	8	6	75.0%	1	12.5%	0	0.0%	1	12.5%
Neonatology	9	4	44.4%	3	33.3%	0	0.0%	2	22.2%
Nephrology	20	19	95.0%	0	0.0%	0	0.0%	1	5.0%
Neurology	44	28	63.6%	6	13.6%	1	2.3%	9	20.5%
Neurosurgery	9	2	22.2%	3	33.3%	0	0.0%	4	44.4%
Normal Newborns	68	63	92.6%	1	1.5%	0	0.0%	4	5.9%
Obstetrics	88	78	88.6%	3	3.4%	0	0.0%	7	8.0%
Oncology	13	1	7.7%	4	30.8%	0	0.0%	8	61.5%
Ophthalmology	1	1	100.0%	0	0.0%	0	0.0%	0	0.0%
Orthopedics	87	25	28.7%	32	36.8%	0	0.0%	30	34.5%
Otolaryngology	24	22	91.7%	1	4.2%	0	0.0%	1	4.2%
Psychiatry	28	24	85.7%	1	3.6%	0	0.0%	3	10.7%
Pulmonary	127	106	83.5%	1	0.8%	1	0.8%	19	15.0%
Rheumatology	0	0	-	0	-	0	-	0	-
Thoracic Surgery	17	13	76.5%	3	17.6%	0	0.0%	1	5.9%
Urology	37	30	81.1%	3	8.1%	0	0.0%	4	10.8%
Vascular Surgery	5	2	40.0%	1	20.0%	0	0.0%	2	40.0%
Other	2	2	100.0%	0	0.0%	0	0.0%	0	0.0%

Source: Nebraska Hospital Association, 2003; Wyoming hospital discharge data set from the Wyoming Hospital Association, 2003.

Note: The highlighted areas are the disease specialty areas for which Wyoming hospitals had a market share between 30% and 85%, assuming that the denominator of the market share (i.e., 100%) only includes discharges in four states (Wyoming, Colorado, Utah, and Nebraska).

Table 6.26. Distribution of Hospital Discharges Among Hospitals of Wyoming, Colorado, Utah, and Nebraska for Residents of Wyoming ZIP Code 82223 by Disease Specialty Area, 2003

Disease Specialty	Total (100%)	# of discharges in WY	Percent	# of discharges in CO	Percent	# of discharges in UT	Percent	# of discharges in NE	Percent
Cardiology	12	7	58.3%	1	8.3%	0	0.0%	4	33.3%
Dentistry	0	0	-	0	-	0	-	0	-
Dermatology	0	0	-	0	-	0	-	0	-
Endocrine	5	3	60.0%	0	0.0%	0	0.0%	2	40.0%
Gastroenterology	10	8	80.0%	0	0.0%	0	0.0%	2	20.0%
General Medicine	9	7	77.8%	0	0.0%	0	0.0%	2	22.2%
General Surgery	7	6	85.7%	0	0.0%	0	0.0%	1	14.3%
Gynecology	4	3	75.0%	0	0.0%	0	0.0%	1	25.0%
Hematology	1	0	0.0%	0	0.0%	0	0.0%	1	100.0%
Neonatology	0	0	-	0	-	0	-	0	-
Nephrology	5	2	40.0%	0	0.0%	0	0.0%	3	60.0%
Neurology	3	3	100.0%	0	0.0%	0	0.0%	0	0.0%
Neurosurgery	2	0	0.0%	1	50.0%	0	0.0%	1	50.0%
Normal Newborns	6	6	100.0%	0	0.0%	0	0.0%	0	0.0%
Obstetrics	8	8	100.0%	0	0.0%	0	0.0%	0	0.0%
Oncology	2	2	100.0%	0	0.0%	0	0.0%	0	0.0%
Ophthalmology	0	0	-	0	-	0	-	0	-
Orthopedics	8	6	75.0%	1	12.5%	0	0.0%	1	12.5%
Otolaryngology	3	3	100.0%	0	0.0%	0	0.0%	0	0.0%
Psychiatry	2	2	100.0%	0	0.0%	0	0.0%	0	0.0%
Pulmonary	9	6	66.7%	0	0.0%	0	0.0%	3	33.3%
Rheumatology	0	0	-	0	-	0	-	0	-
Thoracic Surgery	2	0	0.0%	1	50.0%	0	0.0%	1	50.0%
Urology	3	1	33.3%	0	0.0%	1	33.3%	1	33.3%
Vascular Surgery	0	0	-	0	-	0	-	0	-
Other	1	1	100.0%	0	0.0%	0	0.0%	0	0.0%

Source: Nebraska Hospital Association, 2003; Wyoming hospital discharge data set from the Wyoming Hospital Association, 2003.

Note: The highlighted areas are the disease specialty areas for which Wyoming hospitals had a market share between 30% and 85%, assuming that the denominator of the market share (i.e., 100%) only includes discharges in four states (Wyoming, Colorado, Utah, and Nebraska).

Table 6.27. Distribution of Hospital Discharges Among Hospitals of Wyoming, Colorado, Utah, and Nebraska for Residents of Wyoming ZIP Code 82082 by Disease Specialty Area, 2003

Disease Specialty	Total (100%)	# of discharges in WY	Percent	# of discharges in CO	Percent	# of discharges in UT	Percent	# of discharges in NE	Percent
Cardiology	6	3	50.0%	3	50.0%	0	0.0%	0	0.0%
Dentistry	0	0	-	0	-	0	-	0	-
Dermatology	0	0	-	0	-	0	-	0	-
Endocrine	3	1	33.3%	0	0.0%	0	0.0%	2	66.7%
Gastroenterology	20	13	65.0%	0	0.0%	0	0.0%	7	35.0%
General Medicine	3	2	66.7%	1	33.3%	0	0.0%	0	0.0%
General Surgery	16	12	75.0%	3	18.8%	0	0.0%	1	6.3%
Gynecology	13	13	100.0%	0	0.0%	0	0.0%	0	0.0%
Hematology	1	1	100.0%	0	0.0%	0	0.0%	0	0.0%
Neonatology	1	1	100.0%	0	0.0%	0	0.0%	0	0.0%
Nephrology	2	2	100.0%	0	0.0%	0	0.0%	0	0.0%
Neurology	1	1	100.0%	0	0.0%	0	0.0%	0	0.0%
Neurosurgery	1	0	0.0%	1	100.0%	0	0.0%	0	0.0%
Normal Newborns	17	16	94.1%	0	0.0%	0	0.0%	1	5.9%
Obstetrics	19	18	94.7%	0	0.0%	0	0.0%	1	5.3%
Oncology	2	1	50.0%	1	50.0%	0	0.0%	0	0.0%
Ophthalmology	1	1	100.0%	0	0.0%	0	0.0%	0	0.0%
Orthopedics	8	7	87.5%	1	12.5%	0	0.0%	0	0.0%
Otolaryngology	2	1	50.0%	0	0.0%	0	0.0%	1	50.0%
Psychiatry	2	2	100.0%	0	0.0%	0	0.0%	0	0.0%
Pulmonary	13	9	69.2%	1	7.7%	0	0.0%	3	23.1%
Rheumatology	1	1	100.0%	0	0.0%	0	0.0%	0	0.0%
Thoracic Surgery	5	2	40.0%	3	60.0%	0	0.0%	0	0.0%
Urology	6	5	83.3%	1	16.7%	0	0.0%	0	0.0%
Vascular Surgery	1	0	0.0%	1	100.0%	0	0.0%	0	0.0%
Other	2	1	50.0%	0	0.0%	0	0.0%	1	50.0%

Source: Nebraska Hospital Association, 2003; Wyoming hospital discharge data set from the Wyoming Hospital Association, 2003.

Note: The highlighted areas are the disease specialty areas for which Wyoming hospitals had a market share between 30% and 85%, assuming that the denominator of the market share (i.e., 100%) only includes discharges in four states (Wyoming, Colorado, Utah, and Nebraska).

Table 6.28. Distribution of Hospital Discharges Among Hospitals of Wyoming, Colorado, Utah, and Nebraska for Residents of Wyoming ZIP Code 82212 by Disease Specialty Area, 2003

Disease Specialty	Total (100%)	# of discharges in WY	Percent	# of discharges in CO	Percent	# of discharges in UT	Percent	# of discharges in NE	Percent
Cardiology	9	7	77.8%	0	0.0%	0	0.0%	2	22.2%
Dentistry	0	0	-	0	-	0	-	0	-
Dermatology	0	0	-	0	-	0	-	0	-
Endocrine	4	3	75.0%	0	0.0%	0	0.0%	1	25.0%
Gastroenterology	2	1	50.0%	0	0.0%	0	0.0%	1	50.0%
General Medicine	4	2	50.0%	0	0.0%	0	0.0%	2	50.0%
General Surgery	4	4	100.0%	0	0.0%	0	0.0%	0	0.0%
Gynecology	2	1	50.0%	0	0.0%	0	0.0%	1	50.0%
Hematology	0	0	-	0	-	0	-	0	-
Neonatology	1	0	0.0%	0	0.0%	0	0.0%	1	100.0%
Nephrology	0	0	-	0	-	0	-	0	-
Neurology	3	1	33.3%	1	33.3%	0	0.0%	1	33.3%
Neurosurgery	1	0	0.0%	1	100.0%	0	0.0%	0	0.0%
Normal Newborns	0	0	-	0	-	0	-	0	-
Obstetrics	1	0	0.0%	0	0.0%	0	0.0%	1	100.0%
Oncology	0	0	-	0	-	0	-	0	-
Ophthalmology	0	0	-	0	-	0	-	0	-
Orthopedics	9	5	55.6%	1	11.1%	0	0.0%	3	33.3%
Otolaryngology	1	1	100.0%	0	0.0%	0	0.0%	0	0.0%
Psychiatry	0	0	-	0	-	0	-	0	-
Pulmonary	10	7	70.0%	0	0.0%	0	0.0%	3	30.0%
Rheumatology	0	0	-	0	-	0	-	0	-
Thoracic Surgery	1	0	0.0%	1	100.0%	0	0.0%	0	0.0%
Urology	0	0	-	0	-	0	-	0	-
Vascular Surgery	0	0	-	0	-	0	-	0	-
Other	0	0	-	0	-	0	-	0	-

Source: Nebraska Hospital Association, 2003; Wyoming hospital discharge data set from the Wyoming Hospital Association, 2003.

Note: The highlighted areas are the disease specialty areas for which Wyoming hospitals had a market share between 30% and 85%, assuming that the denominator of the market share (i.e., 100%) only includes discharges in four states (Wyoming, Colorado, Utah, and Nebraska).

Table 6.29. Distribution of Hospital Discharges Among Hospitals of Wyoming, Colorado, Utah, and Nebraska for Residents of Wyoming ZIP Code 82225 by Disease Specialty Area, 2003

Disease Specialty	Total (100%)	# of discharges in WY	Percent	# of discharges in CO	Percent	# of discharges in UT	Percent	# of discharges in NE	Percent
Cardiology	22	22	100.0%	0	0.0%	0	0.0%	0	0.0%
Dentistry	0	0	-	0	-	0	-	0	-
Dermatology	0	0	-	0	-	0	-	0	-
Endocrine	5	4	80.0%	0	0.0%	0	0.0%	1	20.0%
Gastroenterology	19	19	100.0%	0	0.0%	0	0.0%	0	0.0%
General Medicine	8	5	62.5%	1	12.5%	0	0.0%	2	25.0%
General Surgery	24	20	83.3%	1	4.2%	0	0.0%	3	12.5%
Gynecology	8	7	87.5%	1	12.5%	0	0.0%	0	0.0%
Hematology	1	1	100.0%	0	0.0%	0	0.0%	0	0.0%
Neonatology	4	3	75.0%	1	25.0%	0	0.0%	0	0.0%
Nephrology	5	5	100.0%	0	0.0%	0	0.0%	0	0.0%
Neurology	5	2	40.0%	1	20.0%	0	0.0%	2	40.0%
Neurosurgery	2	0	0.0%	1	50.0%	0	0.0%	1	50.0%
Normal Newborns	19	19	100.0%	0	0.0%	0	0.0%	0	0.0%
Obstetrics	19	19	100.0%	0	0.0%	0	0.0%	0	0.0%
Oncology	7	5	71.4%	2	28.6%	0	0.0%	0	0.0%
Ophthalmology	0	0	-	0	-	0	-	0	-
Orthopedics	13	9	69.2%	3	23.1%	0	0.0%	1	7.7%
Otolaryngology	2	2	100.0%	0	0.0%	0	0.0%	0	0.0%
Psychiatry	3	2	66.7%	0	0.0%	0	0.0%	1	33.3%
Pulmonary	22	19	86.4%	0	0.0%	0	0.0%	3	13.6%
Rheumatology	0	0	-	0	-	0	-	0	-
Thoracic Surgery	3	3	100.0%	0	0.0%	0	0.0%	0	0.0%
Urology	3	3	100.0%	0	0.0%	0	0.0%	0	0.0%
Vascular Surgery	0	0	-	0	-	0	-	0	-
Other	2	1	50.0%	0	0.0%	0	0.0%	1	50.0%

Source: Nebraska Hospital Association, 2003; Wyoming hospital discharge data set from the Wyoming Hospital Association, 2003.

Note: The highlighted areas are the disease specialty areas for which Wyoming hospitals had a market share between 30% and 85%, assuming that the denominator of the market share (i.e., 100%) only includes discharges in four states (Wyoming, Colorado, Utah, and Nebraska).

Hospital Inpatient In-Migration from Colorado, Utah, and Nebraska to Wyoming

In 2003, a total of 336 hospital discharges in Wyoming were contributed by Colorado residents, resulting in total charges of $4,845,813 and associated revenue of $3,392,069. Appendix R shows the total charges associated with these in-migrating inpatients from Colorado to Wyoming by disease specialty area. The top three disease specialty areas with the greatest hospital charges were orthopedics ($977,029), general surgery ($969,085), and pulmonary ($441,023).

In the same year, a total of 189 hospital discharges in Wyoming were contributed by Utah residents, resulting in total charges of $1,984,521 and associated revenue of $1,389,165. Appendix S shows the total charges associated with these in-migrating inpatients from Utah to Wyoming by disease specialty area. The top three disease specialty areas with the greatest hospital charges were general surgery ($464,604), orthopedics ($358,249), and pulmonary ($249,879).

Similarly, in the same year, a total of 277 hospital discharges in Wyoming were contributed by Nebraska residents, resulting in total charges of $5,918,702 and associated revenue of $4,143,091. Appendix T shows the total charges associated with these in-migrating inpatients from Nebraska to Wyoming by disease specialty area. The top three disease specialty areas with the greatest hospital charges were thoracic surgery ($1,239,423), orthopedics ($1,002,796), and cardiology ($549,350).

A total of 802 hospital discharges in Wyoming originated from Colorado, Utah, or Nebraska in 2003, resulting in total charges of more than $12 million ($12,749,035). The estimated revenue associated with these charges was about $9 million ($8,924,324).

Summary

In 2003, a total of 6,086 hospital discharges were of Wyoming patients who out-migrated to hospitals in Colorado, Utah, and Nebraska. This accounted for 12.6% of the total discharges of Wyoming patients (48,155 discharges) from hospitals in Wyoming, Colorado, Utah, and Nebraska. The top three Wyoming counties with the most out-migrating hospital discharges to Colorado, Utah, and Nebraska were Sweetwater, Laramie, and Uinta. The top three disease specialty areas with the most Wyoming out-migrating hospital discharges to the same three neighboring states were orthopedics, general surgery, and obstetrics. In 2003, the estimated total lost charges and total lost revenue for Wyoming hospitals due to inpatient out-migration to these three neighboring states were $144.7 million and $101.3 million, respectively. Applying our estimated multiplier from the economic impact analysis, the estimated total less spending for Wyoming communities due to hospital inpatient out-migration to Colorado, Utah, and Nebraska was $32.5 million in 2003. The estimated financial impact is broken down by the destination state of patient out-migration as follows:

Summarized Financial Impact of Wyoming's Hospital Inpatient Out-migration

	2003 Dollar Estimates in Millions				
	CO	UT	NE	Total	
Total charges incurred in the destination state		$110	$64	$5.2	*
Estimated lost charges for WY hospitals	$80	$60	$4.7	$144.7	
Estimated lost revenue for WY hospitals	$56	$42	$3.3	$101.3	
Estimated less spending in WY communities	$18	$13.5	$1	$32.5	

*The total charges incurred in the destination states are not aggregated because of the difference in hospital charge practice among the states.

Our economic analysis shows that the financial impact of hospital inpatient out-migration for Wyoming hospitals and communities is significant. The financial impact includes not only lost revenues for hospitals, but less spending in local communities through the multiplier effect. Although not all of this lost revenue and less spending can be recaptured or recreated, comprehensive strategic planning (including the enhancement of capability and capacity in Wyoming's health care delivery system, and the adoption of marketing strategies targeting out-migrating patients) may help reverse some of the out-migrating utilization patterns.

Part Two: Recommendations for Change

Chapter 7. Other Systems as Models for Change

Key Findings

- The total spending on personal health care in Wyoming was the lowest among the six states we examined.
- Most of the states have formal or informal networks of providers to coordinate care. Examples of strong comprehensive networks across providers are the Alaska Federal Health Care Access Network and the Nebraska Rural Comprehensive Care Network.
- State health agencies use advisory groups to provide technical assistance and formulate recommendations. The Health Policy Commission in New Mexico, for example, is an independent commission monitoring the health status and health care services in the state.
- Alaska and New Mexico have established organizations that track developments in training and placing health care professionals, and develop plans for training and recruitment based on the data collected.
- In Vermont, the Fletcher Allen Telemedicine Program provides regional access to clinical care, medical education, and consultation between rural health care facilities and a hub in Burlington.
- The Vermont Public Transportation Association Program, a public-private partnership, brokers transportation through the Medicaid program in nine regions of the state.
- Catamount Health in Vermont is changing the health care system focus from treating acute illness to managing chronic diseases.
- The Western Region Alliance for Patient Safety is a multi-state (AZ, CA, CO, NM, NV, OK, UT) patient safety organization to advocate adoption of safe practices and share innovative work products and promising practices.
- New Mexico established an interagency behavioral health purchasing collaborative involving over 17 agencies and local collaboratives in each of the state's 13 judicial districts to improve the quality of life for persons with behavioral health concerns.

Methods

We compared characteristics of rural health care delivery systems in Wyoming with characteristics of systems in five other states (Alaska, Nebraska, New Mexico, North Dakota, and Vermont) and New Zealand to guide the research team in developing effective and applicable policy recommendations for improving health care delivery in rural Wyoming. These states and New Zealand were selected due to the rural nature of the population and similar geographical characteristics to Wyoming.[73] We collected and synthesized information about each system from state government agencies, professional associations, rural health organizations and

[73] Total and rural population calculations by U.S. Census Bureau for Wyoming and the five comparison states listed in Appendix T.

research centers, ministries of health, and national data repositories. We then divided comparative analysis of the six systems into two sections: overall health care systems comparison and initiatives to improve health care delivery.

Overall Health Care Systems Comparison

The financing, organization, and governance of health care delivery play an intricate role in enabling people to access safe, effective, patient-centered, timely, efficient, and equitable health care. The six systems we examined reveal distinct differences that may affect access to medical care, quality of care, and patient satisfaction. We first present comparisons between Wyoming and the selected states (Alaska, Nebraska, New Mexico, North Dakota, and Vermont) using national and state data. We then discuss relevant features of New Zealand's unique health care system. Appendix U provides key information about how health care is financed, organized and governed in the six locations. The findings from these data are presented below.

Financing of Health Care Systems

Comparison Between States – To compare how the six states finance health care, we examined three specific areas: total personal health care expenditures, government spending on health services, and health insurance coverage.

During the past decade, the total spending on personal health care in Wyoming, measured by total personal health care expenditure (PHCE), has consistently been lower than that of the selected comparison states.[74] In 2004, Wyoming's total PHCE was $2,270 million while the total PHCE in the comparison states ranged from $3,557 million in Vermont to $9,860 million in Nebraska. This pattern remained consistent even after taking into account population variation between Wyoming and the selected states (i.e., calculating per capita PHCE or total PHCE as a share of the total Gross State Product).[75] In 2004, Wyoming's per capita PHCE ($4,490) was lower than that of the comparison states, with the exception of North Dakota. Wyoming's total PHCE accounted for 9.4% of the total GSP. In the comparison states, the PHCE as a share of the total GSP ranged from 11.6% in Alaska to 17.6% in North Dakota. The PHCE breakdown by service types was similar across the five states, with hospital care and physician services accounting for the majority of the health care expenditure (59% to 69% in 2004).[76]

Similarly, the overall state government spending in Wyoming was among the lowest of the selected states. In 2003, Wyoming's state government expenditures were $4,381 per capita. In

[74] Personal Health Care Expenditure (PHCE) is defined by the Centers for Medicare and Medicaid Services as "the total amount spent to treat individuals with specific medical conditions." PHCE is used here as a proxy measure of the size of the health care industry in each state. This figure is calculated based on all in-state health care providers and does not include spending from government public health activities and program administration.
[75] Gross state product (GSP) is a measure of total economic output of a state. Total PHCE as a share of GSP is a proxy indicator of how much the health care sector accounts for the total state economic output.
[76] Centers for Medicare and Medicaid Services, Office of Actuary. (February 2007). *Health Expenditures by State of Providers: State-specific Tables, 1980-2004.* http://www.cms.hhs.gov/NationalHealthExpendData/downloads/nhestatespecific2004.pdf.

comparison, the states with the lowest and highest state government spending were Nebraska, with $3,920 per capita, and Alaska, with $10,126 per capita, respectively. Among the other comparison states, state government expenditures ranged from $4,464 to $4,945 per capita.[77]

Wyoming's total health care-related government spending accounted for the highest proportion of overall state budget of the comparison states in 2003—32.3% of Wyoming's total state budget. In contrast, comparison states' health care-related spending was 18% in Alaska, 26.6% in New Mexico, 27.2% in North Dakota, 27.7% in Vermont, and 31.6% in Nebraska as a percent of each state's total budget. In 2003, state government spending on health in Wyoming was $1,414 per capita. With the exception of Alaska, among the comparison states, state spending on health was slightly lower than in Wyoming, ranging from $1,212 per capita in North Dakota to $1,367 per capita in Vermont.[77,78]

State government spending on Medicaid in Wyoming was the lowest in both absolute terms and as a share of total state budget. In 2003, Wyoming's government spending on Medicaid was $100 million ($36 million in state funds and $64 million in federal funds), accounting for 4.6% of the total state budget. State spending on Medicaid among the comparison states ranged from $447 million in North Dakota to $2,048 million in New Mexico, accounting for 12.8% to 22.1% of the total state budget.[77]

The average percent of the total population that was uninsured between 2004 and 2005 was 14.8% in Wyoming, lower than the national average (15.8%) and lower than in Alaska and New Mexico.[79] Among the nonelderly population (younger than 65 years), the average percent who were uninsured in Wyoming was 17%, higher than in Nebraska, North Dakota, and Vermont, but lower than in Alaska and New Mexico.[80]

New Zealand – Public sector funding is the major source of finance for New Zealand's health care system, accounting for approximately 80% of all health care expenditures. Out-of pocket expenditures and private insurance are the main sources for the other 20% of all health expenditures. Vote Health is New Zealand's main contributor to its publicly funded health and disabilities services, including District Health Boards and the Ministry of Health. Total funding for Vote Health for the 2005 fiscal year was $9.7 billion for health and disability services, slightly higher than the $8.81 billion spent during the 2004 fiscal year. In the 2006 fiscal year,

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[77] National Association of State Budget Officers. (2005). *2004 State Expenditure Report.* http://www.nasbo.org/Publications/PDFs/2004ExpendReport.pdf.

[78] Milbank Memorial Fund, National Association of State Budget Officers, and Reforming States Groups. (June 2005). *2002-2003 State Health Care Expenditure Report: Tables 14.*

[79] U.S. Census Bureau, Current Population Report. (August 2006). *Income, Poverty and Health Insurance Coverage in the United States: 2005.* http://www.census.gov/prod/2006pubs/p60-231.pdf.

[80] Henry J. Kaiser Foundation. (October 2006). *Individual State Profiles: Health Coverage and Uninsured. http://www.statehealthfacts.org/cgi-bin/healthfacts.cgi?action=profile. *Urban Institute and Kaiser Commission on Medicaid and the Uninsured estimates based on the Census Bureau's March 2005 and 2006 Current Population Survey (CPS: Annual Social and Economic Supplements.*

Vote Health funding increased to $10.64 billion, accounting for 21% of New Zealand's $52.3 billion total government expenses.[81,82]

Looking at health spending in relationship to New Zealand's total population, Vote Health expenditures in the 2004 fiscal year were $2,064 per capita and represented 5.8% of the total gross domestic product. When separated by service categories, personal health and disability support services accounted for the vast majority of Vote Health expenditures (76.9% and 17.9%, respectively). A significant portion of Vote Health's funding is disbursed to District Health Boards (DHBs). During the 2005-2006 budget year, appropriations totaled $7.24 billion (75% of total Vote Health funding), increasing slightly to $7.41 billion in the 2006-2007 budget year (70% of total Vote Health funding). Funding is allocated to DHBs using a weighted population-based funding formula.[82]

Organization of Health Care Delivery

Comparison Between States – To compare how health care delivery is organized, we examined the differences across states in terms of distribution of health care institutions, the health care workforce, and existing rural health networks that facilitate coordination of care.

Wyoming has a total of 34 Medicare-approved hospitals, with 4.2 certified beds per 1,000 people. The number of Medicare-approved hospitals and certified beds among comparison states were as follows: Alaska, 30 hospitals with 3.2 beds per 1,000 people; Nebraska, 98 hospitals with 4.0 beds per 1,000 people; New Mexico, 68 hospitals with 3.2 beds per 1,000 people; North Dakota, 52 hospitals with 5.7 beds per 1,000 people; and Vermont, 16 hospitals with 3.2 beds per 1,000 people. [83]

The total number and distribution of Federally Qualified Health Centers (FQHCs) and Rural Health Clinics (RHCs), often seen as the safety net providers, varies across the states. Wyoming currently has 25 FQHCs and RHCs, combined. In comparison the total combined number of FQHCs and RHCs in the comparison states ranged from 27 in Alaska to 128 in Nebraska.[83]

The health professional workforce varies substantially across the comparison states. For example, in 2004 the number of primary care physicians ranged from 71.7 per 100,000 people in Nebraska to 110.4 per 100,000 people in Vermont. The number of registered nurses ranged from 711 per 100,000 people in New Mexico to 1,180 per 100,000 people in North Dakota. Wyoming's primary care physician and registered nurse workforce numbers were at the lower end of these ranges, with 72.6 primary care physicians and 804 registered nurses per 100,000 people. However, Wyoming has the highest number of optometrists and emergency medical

[81] New Zealand Ministry of Health. (October 2005). *Director-General of Health's Annual Report on the State of Public Health 2005.* *http://www.moh.govt.nz/moh.nsf/0/78619E4262221A28CC2570A00003CBB6/$File/annualreport-healthandindependencereport2005-1.pdf*.

[82] New Zealand Ministry of Health. (October 2006). *Director-General of Health's Annual Report on the State of Public Health 2006.* *http://www.moh.govt.nz/moh.nsf/indexmh/annual-report-0506?Open*.

[83] Health Resources and Services Administration – Geospatial Data Warehouse. (2007). http://datawarehouse.hrsa.gov/.

technicians and paramedics (EMT-paramedics) of the comparison states. In 2004, Wyoming had 23.7 optometrists and 73.05 EMT-paramedics per 100,000 people. Among the comparison states, the number of providers ranged from 7.6 to 18.9 optometrists per 100,000 people and 26.9 to 56.3 EMT-paramedics per 100,000 people. [84]

All six states have health networks of various memberships, purposes, and service areas. These health networks are purposefully created to coordinate integrated health care delivery to the local community (i.e., these networks are not created to unify governing of health providers). Many of the states have networks that coordinate care through health information technology (e.g., telemedicine) and/or quality improvement. The Alaska Federal Health Care Access Network,[85] started in 1998, is an excellent example of a health network that began as a project to improve health care using modern telemedicine technology. Today, AFHCAN links more than 230 clinic and hospitals across the state, including 200 rural communities and 6 regional hospitals. Through the AFHCAN network, rural communities are connected to teleradiology and telepharmacy services, distance education and videoconferencing, and integrated health information systems. Through the AFHCAN network, these services also support Alaska's Community Health Aid/Practitioner and Dental Health Aide Programs.[54]

Several states have rural health networks that include comprehensive health care across the continuum, although the level of development of these networks varies. A promising model is Nebraska's Rural Comprehensive Care Network (RCCN), a non-profit organization created by the collaboration of the South East Rural Physicians Alliance and the Blue River Valley Network Critical Access Hospitals. The mission of RCCN is to promote and support quality rural health care, and in that way helps preserve rural communities. More specifically, RCCN's goal is to provide a rural alternative with services designed with input from businesses and health care providers who work in the area. RCCN's area of membership now covers approximately 20 counties in southeast Nebraska.[86]

New Zealand – The organization of New Zealand's health care system has undergone several changes, moving from a "purchaser/provider" market-oriented model to a population-based model. The passage of New Zealand's Public Health and Disability Act of 2000 created 21 District Health Boards (DHBs) responsible for funding health and disability services to a geographically defined population. DHBs play an important role in coordinating care across public hospitals and a majority of public health services. Twelve public health units, owned by DHBs, provide more than half of New Zealand's public health services.[87][88]

One task of the DHBs has been to work with local communities and provider organizations to establish regional primary health organizations (PHOs). PHOs are the local structures for delivering and coordinating primary health care services, including general practice services,

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[84] New York Center for Health Workforce Studies. (October 2006). *The United States Health Workforce Profile.* http://chws.albany.edu/index.php?id=11,0,0,1,0,0.
[85] Alaska Federal Health Care Access Network. (2007) http://www.afhcan.org/about/default.aspx.
[86] Rural Comprehensive Care Network. (2007) http://www.rccn.info/.
[87] New Zealand Ministry of Health. (October 2006). *Director-General of Health's Annual Report on the State of Public Health 2006. http://www.moh.govt.nz/moh.nsf/indexmh/annual-report-0506?Open.*
[88] Alaska Department of Health and Social Services. (2007). http://www.hss.state.ak.us/.

mobile nursing services, and community health services that target certain conditions (e.g., maternal, mental, and dental health). PHOs vary widely in size and structure, with provider teams of doctors, nurses, and other professionals such as health promotion workers. Currently there are 81 PHOs.[56]

Governance of Health Care Systems

Comparison Between States – To examine how decision making occurs in each of the six states, we examined the overall organization of state health agencies and how they are governed. In addition, we selected two examples to compare states' current Medicaid regulations and licensing of health professionals.

Although the organization of each health agency varies in complexity and size, all include departments/offices addressing mental and behavioral health; public health issues (including emergency preparedness and response); and health services specific to vulnerable populations, such as the elderly, infants/children, and the disabled. Two comparison states, Alaska and Nebraska, have recently or are currently in the process of reconfiguring the organizational structure of their state health agencies. The objective of these reconfigurations is to streamline the services, reduce duplication, and improve consumer's ease of access to the services offered by the agencies.[57,89] One of the most simplistic governance models is Nebraska's newly reorganized structure, with seven departments (operations, public health, Medicaid and long-term care, behavioral health, children and family services, developmental disabilities, and veterans' homes) that oversee all the programs and regulatory functions of the agency. These departments report to the chief executive officer of the Health and Human Services System, who reports directly to the governor.[58] New Mexico has a more complex governance model, similar to that in Wyoming. In this organizational structure, the health agency is overseen by a cabinet secretary. The chief medical officer, deputy secretary of finance and administration, deputy secretary of programs, and deputy secretary of facilities report directly to the cabinet secretary. Under each deputy secretary or the chief medical officer reside divisions responsible for carrying out the state's programs and regulatory functions.[90]

In general, each state or country has some form of an advisory group to the state health agencies (e.g., North Dakota's State Health Council, and Alaska's Partnership for Healthy Communities). These advisory groups may report to the governor, the legislative branch, or both, and serve an oversight function to the state health agencies. A promising advisory group model is that of the New Mexico Health Policy Commission. In New Mexico, an independent commission was created in 2004 to monitor the health status of and health care services in the state. This Health Policy Commission is tasked with conducting analysis, providing technical assistance, and formulating recommendations to both the legislative and executive branch.[91]

While all state Medicaid programs are federally mandated to serve low-income pregnant women and children, eligibility regulations vary across states. In Wyoming, the income threshold for

[89] Nebraska Health and Human Service System. (2007). http://www.hhs.state.ne.us/index.htm.
[90] New Mexico Department of Health. (2007). http://www.health.state.nm.us/.
[91] New Mexico Health Policy Commission. (2007) http://hpc.state.nm.us/.

Medicaid eligibility is 133% of the federal poverty level, the lowest income threshold of the selected states. For all other states compared (with the exception of North Dakota), the income threshold for pregnant women and children is 175% of the federal poverty level or higher. For pregnant women specifically, Wyoming is one of three states that we examined that allow presumptive eligibility.[92]

All selected states require that physicians, nurses, social workers, and mental health counselors must be licensed to practice. However, the level of detail in licensing regulations varies. Nebraska and New Mexico's licensing regulations have detailed subcategorizations of each health profession type. Other states, including Alaska and Wyoming, use less detailed categorizations of health professions. For example, Alaska's regulations classify licenses under the general category of certified nurse aide, while Nebraska's classifications of similar licenses are subdivided further into certified nurse aide, certified medication aide-20 hours, certified medical aide-ICR-MR/nursing, certified staff members-ICF-MR only, etc.

New Zealand – New Zealand's Ministry of Health (Ministry) vision is "to facilitate the development of the health and disability support sector to maximize the potential of people with disabilities and the health of New Zealand people." The Ministry fulfills several roles, including policy advisor, monitor of performance and public health funding, and facilitator of coordination across health sectors. Under the Ministry are eight directories responsible for carrying forth the Ministry's roles: Corporate and Information, Clinical Services, District Health Board Funding and Performance, Disability Services, Mãori Health Mental Health, Public Health, and Sector Policy.

Under section 19 of New Zealand's Public Health and Disability Act of 2000 (the Act), District Health Boards (DHBs) were established and administered through the Ministry. "DHBs are responsible for improving, promoting, and protecting their populations' health independence. They are required to assess the health and disability support needs of the people in their regions, and to manage their resources appropriately in addressing those needs." The Ministry supports the DHBs by providing national policy advice, regulation, and funding. Each DHB has up to 11 members: 7 elected by the community and 4 appointed by the Ministry.

Under this Act, the National Advisory Committee on Health and Disability was appointed as an independent advisory committee reporting directly to the Ministry. The subcommittee, Public Health Advisory, was also established under the Act and was specifically tasked with providing advice on public health issues (including the monitoring and promotion of public health, and factors influencing health of people and communities).[93]

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[92] Kaiser Commission on and Medicaid and the Uninsured. (January 2007). *Resuming the Path to Health Coverage for Children and Parents: 1 50 State Update on Eligibility Rules, Enrollment and Renewal Procedures, and Cost-Sharing Practices in Medicaid and SCHIP in 2006.* http://www.kff.org/medicaid/upload/7608.pdf.

[93] New Zealand National Health Committee. (2007). http://www.nhc.health.govt.nz/moh.nsf/indexcm/nhc-aboutus-role;

Initiatives to Improve Health Care Delivery

We created a matrix of programs, policies, and practices; purposes; and accomplishments from the selected health care systems (Alaska, Nebraska, New Mexico, North Dakota, Vermont, and New Zealand). This matrix, found in Appendix V, is organized by health care delivery needs identified in previous steps of our study. Key programs from this matrix are presented below to describe possibilities in Wyoming.

Workforce Recruitment and Education

Alaska Health Careers[94] – The Alaska Health Careers portal was developed by Allied Health Alliance to provide access to resources for students, educators, and the health care industry seeking information about health careers. Formed in 2002, the Allied Health Alliance is a group of deans, faculty, and staff of the University of Alaska who collaborate with health professionals and organizations across the state. One component of the Allied Health Alliance's mission, to "coordinate and expand health care education course offerings," led to the development of a database of health career education components accessible by all health care educators, workers, students, and potential students/workers. The alliance used funds from the U.S. Department of Health and Human Services, Health Resources and Services Administration (HRSA) to create Alaska Health Careers, which became operational in 2004. Health care career information is accessed through three paths: Career Education, Career Paths, and Career Preparation.

Rural Health Opportunities Program (Nebraska)[95] – Developed in the 1990s, the Rural Health Opportunities Program (RHOP) addresses the special needs of rural Nebraska by encouraging rural residents to pursue health care careers. RHOP is designed for rural Nebraska students, traditional and nontraditional, interested in practicing in small communities throughout Nebraska. If selected, students obtain early admission into participating University of Nebraska Medical Center colleges upon completion of studies at Chadron State College or Wayne State College. The criteria for selection include academic potential and commitment to practicing in the rural areas of Nebraska. During the past 10 years, 343 students have participated in the RHOP. RHOP is recognized as a successful program, with more than 70% of its graduates working in rural communities.

New Mexico Health Resources, Inc.[96] – Founded in 1981, New Mexico Health Resources, Inc., (NMHR) is a private, nonprofit agency organized to support efforts to recruit and retain health care professionals. Its mission is "to assist health care providers in recruiting, placing, and retaining qualified professionals, and to advise the state regarding health personnel needs in New Mexico communities, particularly those which are underserved." Specifically, NMHR is a clearinghouse for health care practice opportunities and information for health care professionals.

[94] Allied Health Alliance, University of Alaska**.** http://www.alaska.edu/alaskahealth/viewArticle.html?id=20. Retrieved April 2, 2007.
[95] Nebraska Rural Health Education Network. http://www.unmc.edu/dept/rhen/. Retrieved April 25, 2007.
[96] New Mexico Health Resources, Inc. http://www.nmhr.org/index.html#. Retrieved April 10, 2007.

The agency also provides training assistance to agencies seeking to improve their recruitment and retention of health care professionals.

New Mexico Center for Nursing Excellence[97] – Established in 2002, the New Mexico Center for Nursing Excellence (NMCNE) is a nonprofit organization, focused on improving the nursing workforce in New Mexico. The goals of the center are to recruit new nurses and support nurses throughout their careers, support nursing education, develop nurse leaders in communities, and honor nurses for their contributions to New Mexico. In 2003 NMCNE, in partnership with the Nightingale Scholarship League, developed the Nightingale Scholarship for nursing students of all levels of nursing education. In 2005, NMCNE received funds from the state legislature to develop the Clinical Teaching Institute (the state legislature appropriated additional funds in 2006 for continued development). The Clinical Teaching Institute provides education opportunities to nurses to support their professional development. Currently the institute offers a full two-day course on preceptorship and a three-tier track for leadership. In addition, the NMCNE maintains a comprehensive statewide nursing data set, including information about nurse demographics, nursing education systems, and the practice work environment.

Access to Care: Provider Location

Frontier Extended Stay Clinic Consortium (Alaska)[98] **–** The Frontier Extended Stay Clinic (FESC) Consortium was developed to demonstrate the operational viability and financial sustainability of an FESC. Under the FESC model, providers in frontier communities offer observation services traditionally associated with acute care inpatient hospitals until the patient can be transferred or is no longer in need of transport. The FESC Consortium and model was a result of discussions between officials in the State of Alaska and several state offices of rural health, primary care offices, and primary care associations to explore the development of a new provider type that would enable reimbursement of such services. The Medicare Prescription Drug, Improvement, and Modernization Act of 2003 authorized the Centers for Medicare and Medicaid Services to conduct a demonstration project in which FESCs would be treated as Medicare providers. (Prior to this demonstration, extended stay services were not reimbursed by Medicare, Medicaid, or other third-party payers). In addition, the FESC Consortium has received funding from the HRSA Office of Rural Health Policy to support the demonstration program.

Fletcher Allen Telehealth Program (Vermont)[99] – In partnership with the University of Vermont College of Medicine, the Fletcher Allen Telehealth program provides regional access to clinical care, medical education, and consultation between rural health care facilities and the Burlington hub. Currently over 12 community hospitals are linked through this program and receive services including rural trauma care, surgical support and follow up, dermatology clinics, telepsychiatry, and renal services. Three projects are included in the Fletcher Allen Telehealth Program: the Vermont Rural Telehealth Initiative, the Teletrauma Project, and the FAST STAR

[97] New Mexico Center for Nursing Excellence. http://www.nmnursingexcellence.org/. Retrieved April 10, 2007.
[98] Alaska FES Consortium. http://www.alaskafesc.org/. Retrieved April 2, 2007.
[99] Fletcher Allen Healthcare. http://www.fahc.org/Telemedicine/Research/fast_star.html. Retrieved March 26, 2007.

Project. The Vermont Rural Telehealth Initiative began in 1998, with funding from the Office for the Advancement of Telehealth, to evaluate the acceptance, satisfaction of use, apparent benefits, strengths, and weaknesses of Fletcher Allen Telehealth Program. The Teletrauma Project is a two-way interactive video telemedicine system to reduce disparities in clinical care and medical education. Its purpose is to provide 24-hour access to trauma center specialty surgeons and educate rural ambulance personnel and doctors with limited access to educational opportunities. Currently seven emergency rooms in rural Vermont and upstate New York are participating in this Office for Advancement in Telehealth-funded project. The FAST STAR project field tests the use of one-way, full-motion video and two-way audio communication between a command center (at Fletcher Allen) and an emergency medical services crew inside an ambulance. This project aims to increase the survival rate of critical patients who are transported via ambulance in rural areas and is funded by the National Highway Traffic Safety Administration.

Vermont Public Transportation Association[100] – Incorporated in 1986, the Vermont Public Transportation Association's (VPTA's) mission is to "develop and provide transportation services to access employment, education, medical, social, recreational, and other services." The VPTA provides information about public transportation to the public and to policymakers, coordinates information and resource sharing for members, and contracts with government agencies to administer and develop transportation services statewide. The VPTA Medicaid Transportation Program, started in 1986, is a public-private partnership between Vermont's community transportation providers and the State Agency of Human Services to deliver coordinated transportation under a brokerage agreement with the Office of Vermont Health Access. VPTA serves as the program manager and single point of contact and accountability for the medical transportation programs of nine regional Medicaid brokers statewide. This program has been nationally recognized for its low cost, innovative coordinated approach to providing service. Ladies First was launched in 1995 to provide cancer screening and testing services for financially constrained women age 45 and older. Under this federally funded statewide program, the VPTA and its member organizations provide transportation services to and from appointments.

Access to Care: Financial Assistance

Insure New Mexico![101] – In 2004, the Insure New Mexico council was created by the governor with the mission to reduce the number of people without health insurance and increase the number of employers offering health insurance to their employees. Initiatives recommended by the council and signed into law by the governor include the following:

- State Coverage Insurance is a public/private partnership that offers affordable health care coverage to eligible low-income working adults, primarily through an employer-based system. It is available to uninsured adults aged 19 through 64, with countable family incomes of up to 200 percent of the federal poverty level.

[100] Vermont Public Transportation Association. http://www.vpta.net/. Retrieved 26, 2007.
[101] AcademyHealth. (January 2007) *State of the States: State Coverage Initiatives.* http://www.statecoverage.net/. Retrieved March 10, 2007.

- The Small Employer Insurance Program is a new program with a comprehensive benefit package and an annual benefit limit of $100,000 per member available to employees and their dependents. It is available for employees of small businesses who have not had health insurance for the past 12 months.
- The Health Insurance Alliance (HIA) offers three types of broker-assisted comprehensive plans: PPO, Indemnity, and HMO, through 11 participating commercial carriers. Employees' and dependents' share of premiums depends on employer contribution. New Mexico HIA policies are available to those who currently offer insurance coverage. Policies are available for employees and dependents of small businesses (2-50 employees), self-employed persons with at least one dependent, and individuals.
- New Mexico Medical Insurance Pool is an insurance product for high-risk employees and individuals with preexisting conditions or individuals who have been previously rejected by commercial carriers due to health status.
- Expanded *New Mexikids* now covers more children and pregnant women through traditional Medicaid, an expanded State Children's Health Insurance Program, and the new premium assistance program, which provides assistance for purchase of health insurance for children and pregnant women who do not qualify for certain state or federal programs.

Catamount HealthPlan: The 2006 Health Care Affordability Act (Vermont)[102] – Passed by legislation in Vermont in 2006, the Catamount Health Plan was the state's first step in changing its health care system from a focus on treating acute illness to managing chronic diseases. The goal of this plan is to provide insurance coverage for 96% of Vermonters by 2010. There are two components of the Catamount Health Plan:

1. A new insurance market especially for the uninsured and underinsured.
   Coverage is based on the typical nongroup market product offered in the state, but with much less cost sharing by the individual or family. Specific services and cost benefits must be included; e.g., for individual coverage, the plan cannot have more than a $250 deductible, 20% coinsurance, $10 office visit co-pay, no prescription drug deductible, no out-of-pocket for preventive and chronic care, and an out-of-pocket maximum of $800 per year.
2. A mechanism to provide coverage for people who are uninsured, but eligible for insurance through their employer, if the insurance meets coverage standards.
   Individuals and families with incomes up to 300% of the federal poverty level receive subsidies. In addition, the state provides premium assistance to low-income individuals with access to employer-sponsored insurance that had previously been unable to afford insurance.

[102] AcademyHealth. (January 2007) *State of the States: State Coverage Initiatives.* http://www.statecoverage.net/. Retrieved March 10, 2007.

Quality of Care

CheckPoint (New Mexico)[103] – Coordinated by the New Mexico Hospital and Health Systems Association, CheckPoint is a voluntary program for reporting quality of care measures. The purpose of CheckPoint is to provide information to purchasers on the quality of care provided by hospitals, to consumers to facilitate their choice of provider, and to hospitals for quality improvement. Currently 34 acute care and critical access hospitals serving a majority of New Mexico residents participate in CheckPoint. The 14 clinical measures tracked by CheckPoint were selected based on the three most common causes of hospitalization (pneumonia, heart attack, and congestive heart failure) and are endorsed by the National Quality Forum.

Western Region Alliance for Patient Safety (New Mexico)[104] – This multi-state patient safety organization includes members from Arizona, California, Colorado, New Mexico, Nevada, Okalahoma, and Utah. The Alliance's mission is "to enhance and promote patient safety by advocating the adoption of regional safe practices in health care organization and sharing innovative work products and promising practices."

Rural Quality Improvement Steering Committee (Nebraska)[105] – Created in 2002, the Rural Quality Improvement Steering Committee was formed as result of the statewide Quality Improvement Conference sponsored by the Nebraska Office of Rural Health, the Nebraska Hospital Association, and the Sunderbruch Corporation-Nebraska (Sunderbruch was the quality improvement organization in 2002, but it has since been replaced by CIMRO of Nebraska). The committee's purpose is to provide the framework for developing a quality improvement plan that is comprehensive, integrated, and holistic in its approach to quality management. Specifically, the committee was charged with developing a model quality improvement plan for Nebraska hospitals, developing sample forms for use in completing quality improvement activities, completing a dashboard report for use by hospitals, and identifying education necessary to accomplish these quality improvement goals.

Core Services: Behavioral/Mental Health

Behavioral Health Integration Project (Alaska)[106] – In 2003, Alaska was awarded a five-year Substance Abuse and Mental Health Services Administration Co-occurring State Incentive Grant to enhance their infrastructure to increase their capacity to provide accessible, effective, comprehensive, coordinated/integrated, and evidence-based treatment services to persons with co-occurring substance abuse and mental disorders. The Behavioral Health Integration Project

[103] New Mexico Hospitals & Health Systems Association. http://www.nmcheckpoint.org/about/sponsor.php. Retrieved April 10, 2007.
[104] Western Regional Alliance for Patient Safety. http://www.azhha.org/public/uploads/WRAPS%20Charter.pdf. Retrieved April 10, 2007.
[105] Nebraska Hospital Association. http://www.nhanet.org/quality_patient/about.htm#steering_committee. Retrieved April 25, 2007.
[106] Division of Behavioral Health, Alaska Department of Health and Social Services. http://www.hss.state.ak.us/dbh/resources/initiatives/default.htm. Retrieved April 2, 2007.

occurred in two phases. Phase one (first three years) focused on development and enhancement of infrastructure, and phase two (last two years) incorporated evaluation and continuous collection of performance data. As part of this statewide effort to integrate behavioral health services, the Alaska Automated Information Management System (AKIMS) was initiated in February 2003 to enhance the state's management information system and clinical documentation. AKIMS is an evolving, web-based application and database that serves dual purposes, to meet state and federal reporting requirements and to serve as a tool to create full electronic medical records for patients.

Interagency Behavioral Health Purchasing Collaborative (New Mexico)[107] – This statewide initiative involves over 17 agencies interested in developing strong local voices to guide behavioral health planning and services. Local collaboratives were developed in each of the state's 13 judicial districts formally recognized by the state. In addition, a limited number for the state's sovereign tribes and pueblos were included in these collaboratives. Each local collaborative is tasked with identifying needs, developing a range of resources, and ensuring the responsiveness and relevance of behavioral health services and supports to improve the quality of life of those affected by behavioral health concerns. Moreover, these local collaboratives help create and enhance needed partnerships, are the voice of local communities, and are the entities that state agencies will utilize for local input and decision-making. The Behavioral Health Planning Council was created to serve as the single statewide advisory structure for behavioral health in New Mexico and is intended to have an ongoing advisory role to this collaborative. Specifically, the council's tasks include supporting the development of a comprehensive, integrated, community-based behavioral health system of care, and advising the collaborative and state agencies responsible for behavioral health services for children and adults.

Core Services: Elderly and Disability Care

Alaska Pioneer Homes[108] **–** Six assisted-living facilities across the state are operated by the Division of Alaska Pioneer Homes. As of March 2007, system-wide occupancy of these Pioneer homes was 86%. Of the 441 residents, 23% are veterans and 58% require high levels of professional care available 24-hours a day. Approximately 50% of residents depend on the Medicaid waiver and/or state-funded payment assistance program to pay for at least part of the monthly rate. Over 2,700 qualified Alaska residents (age 65 and older) are on the waiting list for the facilities. In May 2004, legislation was passed to develop the state's first Pioneer and Veterans Home. In the summer of 2005, in cooperation with the Veterans Administration, the State of Alaska will begin a major remodel and upgrade of the Palmer Pioneer Home.

[107] New Mexico Behavioral Health Planning Council. http://www.bhd.state.nm.us/collaboratives.html. Retrieved April 10, 2007.
[108] Division of Alaska Pioneer Homes, Alaska Department of Health and Social Services. http://www.hss.state.ak.us/dalp/. Retrieved April 2, 2007.

Personal Care Assistant (PCA) Program (Alaska)[109] – This statewide program, through the state's Medicaid program, offers home care services to functionally disabled and handicapped individuals and the elderly. These services, provided by PCAs, may include bathing, dressing and grooming, shopping and cleaning, and other activities requiring semiskilled or skilled care. Services are provided through two different program models. Under the agency-based PCA program model, the consumer receives services through an agency that oversees, manages, and supervises the care. Under the consumer-directed PCA program model, consumers manage their care by selecting and supervising their own PCA while the agency provides administrative support. Currently the PCA program serves 125 Alaskan communities.

Mi Via (New Mexico)[110] – Through a planning and development grant from the Robert Wood Johnson Foundation, New Mexico developed and implemented the Mi Via program in November 2006. This self-directed program allows participants to choose services they need, hire their own service workers, and decide where and how to spend their Mi Via budget. Consulting services and assistance are available to participants as necessary. Those eligible for the Mi Via program include Medicaid recipients receiving long-term services through home- and community-based waiver programs.

Medically Handicapped Children's Program (Nebraska)[111] – Part of the state's Title V services for medically handicapped children, this program provides family-focused services coordination/case management, specialty medical team evaluations for children in local areas, access to specialty physicians, and payment of treatment services. A services coordinator/social services worker is assigned to help families access services to fit their needs and those of the child with a disability or chronic health care need. The worker is the family's link to the medical team evaluation and treatment planning process through specialty teams for children and youth. Specialty teams for children and youth consist of specialty physicians, nutritionists, nurses, occupational therapists, physical therapists, psychologists, dentists, speech and hearing pathologists, and the family. Team membership depends upon the particular medical conditions being reviewed. Teams provide diagnosis of the medical concerns and problems, a written plan of treatment, and access to all the team members at one time and place. There are no financial eligibility requirements to have the program provide a diagnosis and treatment plan.

Summary

The systems selected for comparison to Wyoming all face similar needs to distribute resources (including health professionals) across vast spaces of rural territory, to support public services on a limited revenue base (due to combination of low wealth and expectations for minimal tax

[109] Division of Senior and Disabilities Services, Alaska Department of Health and Social Services. http://www.hss.state.ak.us/dsds/pca/default.htm. Retrieved April 2, 2007.
[110] New Mexico Aging and Long-Term Services Department. http://www.nmaging.state.nm.us/. Retrieved April 10, 2007.
[111] Nebraska Health and Human Services System. http://www.hhs.state.ne.us/chd/mhcp.htm. Retrieved April 25, 2007.

burdens), and to change existing patterns of health care delivery to meet new demands for evidence of high quality care. Leaders in Wyoming can learn from the accomplishments in other states and nations. For example, appropriate use of telemedicine can help resolve problems of shortages of key personnel. Other states have also developed different strategies for recruiting and retaining health care professionals, from getting elementary grade students interested in science, to offering special training tracks to high school graduates that lead to admission to health professional training programs, to rural training tracks in health professions training, to support for professionals in practice in rural areas (e.g., continuing education). Other states have invested in an infrastructure that can continuously monitor developments in health care delivery and finance and make recommendations to policy makers for actions that could make health care more cost-effective. Particularly impressive are special efforts designed to encourage the development of health care delivery networks in areas of states (and New Zealand), initiatives to improve access to behavioral health services (especially in Alaska) and initiatives to monitor and improve quality of care (i.e., the CheckPoint program in New Mexico and Nebraska's Rural Quality Improvement Steering Committee).

Chapter 8. Recommendations

Recommendation to Meet the Need for Health Professionals

1. Establish a coordinated, multifaceted approach to health care provider recruitment and retention.

- Establish a task force for this purpose that includes representation of health professions education programs (including multi-state consortia), the health professions, institutional providers, and licensing boards.
- Using the data provided by the Health Professions Tracking Center, the task force should consider needs for all health care professionals, including but not limited to, physicians, nurses, therapists, laboratory and radiology technicians, hospital administrators, pharmacists, public health professionals, mental health professionals, dentists, dental hygienists, etc.
- Establish targets for each profession based on national professional-to-population ratios and sensitive to the distance between providers and minimum staffing requirements of small hospitals and other providers.
- Assess current and future health care professional needs by location and profession type across Wyoming.
- Work closely with WWAMI (a partnership between the University of Washington School of Medicine and the states of Wyoming, Alaska, Montana, and Idaho) and the Western Interstate Commission for Higher Education to meet the expectation that Wyoming students be prepared and encouraged through the use of incentives to return to Wyoming for practice.
- Secure access to continuing education programs in rural communities, including use of televideo technologies as appropriate.
- Emphasize training programs that are interdisciplinary and community-based.

Rationale: *Like many rural states, Wyoming struggles to fill its health care professional recruitment and retention needs. Wyoming is further disadvantaged because it does not have a medical school (although Wyoming participates in WWAMI). Many recruitment and retention strategies exist, but it is unclear if a single Wyoming strategy effectively provides the recruitment and retention necessary to eliminate rural health care professional shortages. Thus, a comprehensive and integrated approach is necessary, one that includes regularly reviewing and adjusting as new shortages or surpluses develop.*

Initial Steps in Implementation

- Nurture already successful programs:
    - Restart the seven-week high school summer enrichment program (U-DOC) previously sponsored by WWAMI and the Wyoming Area Health Education Center.
    - Expand the use of rural sites in the pharmacy residency program.
    - Promote student enrollment in the Student Providers Aspiring to Rural Experiences program that encourages meeting the needs of underserved populations.
    - Continue state support of the nurse practitioner training program.
    - Provide resources to add faculty to the School of Social Work to increase the class size in the master's of social work program.
- Appoint members to the new Wyoming Task Force for Health Professions Training, Recruitment, and Retention.
- Provide permanent funding for the task force.

Recommendations to Improve Health Care in Communities

2. Assess access to core health care services (public health, emergency medical services, primary care), and then engage the Wyoming Health Planning Commission (see Recommendation 9) to design cost-effective strategies to deliver core services to all Wyoming residents.

- Establish a process for ongoing assessment of availability of core services in every Wyoming community of 1,500 or more residents.
- Link this assessment to the assessment of health care professionals in Recommendation 1.
- Aggregate community assessments to determine statewide need.

Rationale: *Sparsely populated areas, boom-bust economies, and suboptimal integration of health care delivery across the continuum of care risks Wyoming people's health and quality of life. Although our interviews suggested good primary care access in Powell, a significant amount of primary care is delivered in the Emergency Department (ED) in Rawlins. Most experts would agree that ED care is more expensive and less preferable than well-established primary care. Furthermore, our interviews did not include the most sparsely populated areas of Wyoming, where access to basic primary care is impeded by distance and provider availability. Emergency medical service(EMS) care is time-dependent; therefore, statewide plans and crew distribution are needed to ensure timely availability of EMS services. Public health is increasingly recognized as the vehicle by which communities can improve health, quality of life, and*

attractiveness to employers. Yet our interviews suggested limited interaction between public health providers and more traditional health care providers, such as doctors and hospitals.

Initial Steps in Implementation

- Designate responsibility for community assessments, most likely to local departments of public health.
- Examine alternative methodologies used by other states.
- Conduct two initial assessments to determine best method for Wyoming.

3. Develop a coalition of state leaders, health care insurers, and major Wyoming employers to implement joint strategies that improve population health and worker productivity.

- Strategies implemented in a limited number of locations can be replicated throughout the state.
- The focus on population health requires that all factors influencing general health be included, such as the environment, housing, and education.
- The focus on worker productivity should generate innovative approaches to encourage individual well-being and pro-active steps to assure worker safety.

Rationale: *Other than government, employers are the largest purchaser of health care services. Employers have a strong interest in a productive workforce and attractive communities. Accessible and high-quality health care is essential to attract new business. Insurers can help design insurance products that foster these outcomes. Wyoming's economy, significantly based on natural resources, has been described as "boom or bust." However, much of the Wyoming population requires health care services regardless of the economic environment. A coalition as described above will assist Wyoming residents in maintaining good health despite unfavorable economic conditions. Productive workers and an accessible and high-quality health care system are important strategies to turn bust into boom.*

Initial Steps in Implementation

- Identify state leaders to initiate this effort.
- Identify one or two communities ready to undertake projects.
- Seek external support for those projects (e.g., federal grant support, private foundation funding).

4. Charge a work group to assess community health, facilitate public health and local provider integration, implement community health improvement strategies, and remeasure to assess intervention effectiveness.

- The activities satisfying this recommendation should consider a regional approach to integrating services, meaning aggregations of communities and surrounding areas to a level capable of sustaining primary and secondary health care services.
- Service integration should include how the regional services are integrated with services provided to local residents by health care professionals and institutions outside the region.

Rationale: *The continuum of care model suggests that integration of services along the continuum is critical to both efficient and comprehensive care. The "beginning" of the continuum is preventive care and an understanding of community health needs. This analysis and integration strategy needs facilitation. For example, sophisticated primary care (and some secondary care) is delivered in Powell, but minimal interchange occurs between public health and traditional health care providers. Although public health may not be the ideal facilitator in all areas, the role of the Department of Health is essential to assessing community status and facilitating patient flow along the continuum.*

Initial Steps in Implementation

- A state commission should recommend logical regions of the state for the purposes of planning related to primary and secondary services.
- Coalitions should form within those regions for the purposes of developing targeted interventions.
- The state should retain the services of an external consultant to assist the initial development of regional interventions.

5. Target Wyoming's "vulnerable" communities for detailed community assessment and needs analysis to protect people in greatest need and improve community vitality. Then, request that the Wyoming legislature direct appropriate resources to those communities.

- RUPRI research, using 2000 census information, identifies one Wyoming community as *vulnerable* based on community characteristics. Variables used to assess community vulnerability include access to health care and service utilization, health insurance coverage, employment rates, poverty rates, and age/race demographics. In addition, greater than 70% of the rest of the state is vulnerable based on population characteristics.
- RUPRI methodology can assist state health planners target resources to those Wyoming communities in greatest need and at greatest risk.

Rationale: *Health care system and community development resources are necessarily finite. Thus, Wyoming health planners require an objective method, such as the RUPRI vulnerable*

community identification, to prioritize resource commitment. Resource commitment should be preceded by timely yet comprehensive needs assessment and should be followed by outcome analyses.

Initial Steps in Implementation

- Reach consensus among Wyoming stakeholders (e.g., public policy makers, health professions associations, business leaders) that the vulnerable places are correctly identified.

Recommendations to Monitor and Analyze Trends In Health Care Delivery

6. Implement a plan to assess health information and communication needs and then prioritize resources for health information and communication needs. Provide funding to develop Wyoming's health information infrastructure.

- Collaboration between the Wyoming Department of Health, Department of Administration and Information, and other state agencies will accomplish this objective.
- The infrastructure includes the necessary physical system and the software to facilitate communications across health care providers regardless of the particular systems different providers use.
- Assessment of needs is an ongoing process, focused on what is best to facilitate patient-centered care.
- The focus on this recommendation is on all uses of telehealth, with a particular emphasis on improvements in patient care that are facilitated by effective use of communications technology.

Rationale: *Increasingly, health care providers are relying on a variety of information technology and communication strategies to improve health care access and quality. The growing payor and societal demand for quality information transparency requires sophisticated information systems to ease the burden of data collection and reporting. The need for information technology and communication strategies is likely to be more acute in rural areas due to care coordination issues at a distance and lack of readily available continued medical education and other health care provider support. Yet, multiple interviewees (health care providers, state employees, and community members) noted that Wyoming's health information technology is underdeveloped and hence underutilized. Wyoming health care providers have been "slow to adopt" new technologies (other than diagnostics and certain treatment technologies). Wyoming's rural geography and distance between health care providers suggests a significant need for robust health information technology and communication. For example, telemedicine can obviate the need for patient travel. Accurate information flow between health care providers, regardless of distance, can reduce health care costs and increase health care quality and safety.*

Initial Steps in Implementation

- Coordinate all existing efforts through a state-supported entity that has the endorsement of all the critical stakeholders (e.g., health professions, state government, utilities industry, insurance industry, health institutions such as hospitals and nursing homes).
- Conduct a critical review of what has been done in Wyoming to the point in time of the first meeting of the task force.
- Work with a consultant to complete a comprehensive needs assessment for the state. (The consultant could be from the University of Wyoming; if not, the consultant should work with the staff of the university.)

7. Convene a health care provider group under the direction of the Wyoming Health Planning Commission (see Recommendation 9) to assess patient migration patterns (both within state and out of state) and then implement a plan to improve access to Wyoming health care providers.

- Assessment of patient migration should become an ongoing activity.
- Data to support this activity will need to be collected on a continuous basis and should include both inpatient and outpatient data.
- Representatives to the task force should be subject to change as the state's economy changes to involve different employers.

Rationale: *Community interviewees and health care providers noted the long distances that patients must travel for certain health care services (especially mental health services). Some health care providers and Commissioners expressed concern about patients traveling out of state for services available instate. However, providers in Powell were satisfied with patient referrals to Billings, Montana. Most experts would agree that when clinically appropriate and safe, health care is best when it is delivered locally. Furthermore, appropriate utilization of local health care services supports local economies and supports local providers. A strong and enduring local health care system provides residents a sense of security and is an important factor when new potential employers evaluate a community.*

Initial Steps in Implementation

- Identify the appropriate members of the task force and convene a meeting of that group.
- Review the data presented in this report and develop ideas for interventions.
- Develop and implement at least one intervention.

8. Design a process to analyze boom and bust economic impacts and then design strategies to mitigate the negative effects of bust economies and extend the positive effects of boom economies.

- Monitor a database for Wyoming that tracks "real time" effects of changes in the economy.

Rationale: *Many Wyoming communities have experienced boom and bust economies based on energy and extraction sectors. Although currently enjoying a boom related to energy prices, Wyoming's rollercoaster economy is likely to persist. Bust economies leading to population loss, insurance coverage loss, increased Medicaid, and less disposable family income can threaten provider practice viability and consequently access to health care services. Less obviously, boom economies can lead to unintended and wasteful health care system growth that inadequately plans a health care system designed to endure beyond the economic boom initiating its inception.*

Initial Steps in Implementation

- Complete a literature review of studies of boom and bust economies (could be coordinated with graduate programs at the University of Wyoming.)

9. Establish and fund a Wyoming Health Planning Commission (WHPC).

- The foundations for this commission should be activities of local coalitions throughout Wyoming and the lessons learned from previous efforts to coalesce interests across the state.
- The WHPC should interact with the task forces contained in the recommendations of this report, either as subgroups of the WHPC or as separate entities.

Rationale: *Consistent and strong leadership is essential to guide Wyoming health care successfully into the future. Multiple interviewees suggested that current leadership focus on narrow and/or near-term issues does not serve rural Wyoming people and places well. With thoughtful member selection, full funding, and decision-making authority, the WHPC can assist current and future Wyoming leadership. Consistent with national concerns, RUPRI research demonstrates significant health care gaps in Wyoming and a need for statewide health care planning and service coordination. Wyoming cannot afford to waste resources due to poor health care service coordination, pay for services that do not improve the health of Wyoming residents, or support non-Wyoming health care providers when instate providers could provide equal or better care. For example, in Powell, interviewees noted several state programs for poor and/or migrant individuals, but minimal coordination across the programs, resulting in waste and preventing needy individuals from receiving care. Research also demonstrates a significant concern about health care professional recruitment and retention. Health care provider recruitment and retention is a complex challenge requiring a multifaceted and coordinated approach. Therefore, comprehensive and coordinated policies are needed to ensure that Wyoming is well-served by health care professionals into the future (see below).*

Initial Steps in Implementation

- Draft a specific proposal.
- Obtain consensus from health provider groups, state government, and major economic interests in Wyoming to pursue this recommendation.
- Appoint the initial members to the group.

Recommendations to Achieve Systemic Change in Health Care Delivery and Finance

10. Charge a work group to begin comparative analyses of treatment protocols and medication use.

- Look for variation by location of service and/or provider of service. Such variation is unlikely to be driven by patient or illness differences.
- Consider a demonstration project (within the Medicaid program or as a collaboration with a health plan) that begins to pay differentially more for evidence-based care and less for unproven care.

Rationale: *Like all states, Wyoming cannot afford to purchase health care services that do not benefit the patient or the community. There is an increasing national call (the Medicare Payment Advisory Commission and the Agency for Healthcare Research and Quality), fueled by findings from the Dartmouth Atlas of Health Care, to critically examine health care services that may be commonly delivered, but not proven to be of benefit to patient or community. Wyoming can be a state leader in this analysis.*

Initial Steps in Implementation

- Coordinate with other recommendations for action in Wyoming to address improvements in quality of care and patient safety.
- Develop a report of what has worked in other states.
- Seek opportunities to collaborate with other states.
- Work with the state rural hospital flexibility grant program to achieve mutual goals.

11. Establish projects to test potential improvements to the health care system designed to increase health care value (improved quality, improved service, and/or decreased cost).

- Potential demonstration projects include payment reduction for services not supported by evidence, pay-for-performance strategies, payment for episodes of care (considers multiple providers along the continuum of care), etc.

- Consider community-based foundation (or other entity) responsible for allocating community health care resources to various providers, including public health.

Rationale: D*emonstration projects may be an excellent approach to testing potential improvements for Wyoming health care delivery. Options for demonstration projects include focusing on a group of private employers and covered employees, a cooperative HMO group, or state employees. The WHPC can also learn from current projects within the state's Medicaid program. Wyoming can be "ahead of the curve" in testing new health care methodologies and preparing its providers to demonstrate health care quality and efficiency. Although there are many potential pitfalls to pay-for-performance strategies, pay-for-performance is certainly increasing.*

Initial steps in implementation

- Monitor opportunities available through national grant programs (government and foundation supported).
- Solicit interest in this effort from Wyoming health professions and institutional providers.

12. Continue and expand Wyoming Office of Rural Health efforts in the Medicare Rural Hospital Flexibility (Flex) grant program to develop critical access hospital (CAH) networks and foster collaborative linkages between Wyoming's primary, secondary, and tertiary hospitals.

- Support locally-based activities, especially those that are led by the CAHs.
- Strengthen support for local delivery of health services by encouraging regional referral hospitals to be involved in rural community health activities throughout their regions.

Rationale: *Regional integration can improve provider coordination along the continuum of care. Provider coordination and collaboration has the potential to improve patient access, improve efficiency and reduce waste, and improve health care quality and patient safety. The Flex program specifically funds statewide rural health planning, CAH support, and emergency medical service development. Seamless patient transitions along the continuum of care is an overarching health system goal. Care coordination begins with development of collaborative linkages and networking.*

Initial steps in implementation

- Work with the state office of rural health to strengthen the Flex program by broadening the framework for that program now that CAHs have been designated.
- Leverage the use of Flex program resources by linking those program objectives with other objectives related to patient care and community health.

13. Consider health care service development as one facet of a multisector approach to economic development.

- The Wyoming Health Planning Commission should obtain input from state officials, experts, and consumers regarding the impacts of non-health care sectors (see below) on community health.

Rationale: *Housing, employment, environment, recreation, and education are critical components of a comprehensive rural economic development plan.*

Initial steps in implementation

- Create an interagency task force for community well-being that includes representation and at times, leadership from the health department.
- Discuss the implications of health care as an economic engine in rural Wyoming communities—as an attractor of resources and as a critical element of the local infrastructure.

Recommendations for Specific Actions

14. Specifically address rural mental health and substance abuse issues. Monitor the effectiveness of current system investments.

- Long term health of individuals and communities includes the mental health of residents.
- The health care delivery system can be easily overwhelmed by the consequences of substance abuse.
- Substance abuse should be treated as an individual problem and as a social problem.

Rationale: *Inadequate access to mental health services is a national concern. The Wyoming legislature allocated $20 million to build five mental health regions that include emergency/crisis response and moderate/intensive residential care. An additional program allocated $9 million for youth and substance abuse. Despite these investments, interviewees note continued local concerns about substance abuse and mental health care access difficulties.*

Initial steps in implementation

- Agree to a set of key indicators to track over time.
- Be sure that persons working in the fields of mental health and substance abuse are included in any comprehensive planning related to health care services.

15. Specifically address the health care (physical and mental) and housing (independent living, assisted living, nursing home, etc.) needs of the Wyoming elderly.

- Reexamine the current Wyoming elderly housing certificate of need policy that is state-based rather than regional-based or local-based.

Rationale: *Like most rural states, Wyoming is aging. The aging will require increased health care services and age-appropriate housing. Furthermore, interviewees expressed concern about availability of assisted living facilities. The goal is a healthy, productive, and independent elderly population. To develop Wyoming as a retirement destination and serve an aging population, Wyoming should provide accessible and high-quality health care, housing alternatives appropriate to citizen needs, and elderly volunteer opportunities.*

Initial Steps in Implementation

- Bring together stakeholders in housing, community development, economic development, and transportation to develop a comprehensive approach to meeting the needs of the elderly and disabled populations.
- Examine the issue within regions of the state.

16. Continue development of a statewide EMS and patient transportation plan.

- Use state Flex Program funds to continue development of a rural Wyoming EMS plan.

Rationale: *EMS serves a life-saving function, especially in a frontier state like Wyoming when distance and travel time to even primary care may be significant. Interviewees expressed concern about the long-term viability of a largely volunteer EMS staff. Furthermore, state officials desire that Wyoming patients receive health care in-state if possible. A robust Wyoming patient (and family) transportation system, charged with transporting patients between local communities and tertiary care hospitals and specialty services, may increase the use of in-state providers.*

17. Within demonstration project(s), investigate development, implementation, and outcome evaluation of a healthcare funding strategy that places at least partial resource allocation authority within a representative community foundation (e.g., a Health Outcomes Trust or Primary Care Trust).

- The foundation could perform community/regional planning for public health, provider recruitment, tertiary hospital and specialty consultant relationships, and resource allocation.
- Specific resources should be allocated for foundation member education and compensation.

Rationale: *As in politics, it is said that all health care is local. Indeed, local community members may make the best assessments of community health care needs and priorities. However,*

community representatives require education before given the authority to allocate health care resources that often originate with state taxpayers or other sources outside of the community. Nonetheless, the health care services literature (Kindig, D. Purchasing Population Health: Paying for Results) *and experiences in England (Primary Care Trusts) suggest that local/regional control of health care resources can better meet local health care needs and utilize resources wisely.*

Initial Steps in Implementation

- Review the experiences of other places that have implemented a similar approach.
- Develop a working document describing the core elements of this strategy.

Appendix A. U.S. Census Population Data by County and State, Wyoming 1980 to 2020

Table A.1 Population Census and Projections by County, Wyoming 1980 to 2020

	1980*		1990*		2000*		2010**		2020**	
AREA	Total Population	Percent of Total	Total Population	Percent of Total	Total Population	Percent of Total	Total Population	Percent of Total	Total Population	Percent of Total
Wyoming	**469,557**	**-**	**453,588**	**-**	**493,782**	**-**	**519,595**	-	**533,534**	-
Albany	29,062	6.2	30,797	6.8	32,014	6.5	32,204	6.2	31,405	5.9
BigHorn	11,896	2.5	10,525	2.3	11,461	2.3	11,439	2.2	11,324	2.1
Campbell	24,367	5.2	29,370	6.5	33,698	6.8	39,701	7.6	44,595	8.4
Carbon	21,896	4.7	16,659	3.7	15,639	3.2	14,671	2.8	13,965	2.6
Converse	14,069	3.0	11,128	2.5	12,052	2.4	12,882	2.5	13,392	2.5
Crook	5,308	1.1	5,294	1.2	5,887	1.2	6,222	1.2	6,419	1.2
Fremont	38,992	8.3	33,662	7.4	35,804	7.3	36,872	7.1	37,135	7.0
Goshen	12,040	2.6	12,373	2.7	12,538	2.5	12,086	2.3	11,596	2.2
Hot Springs	5,710	1.2	4,809	1.1	4,882	1.0	4,555	0.9	4,391	0.8
Johnson	6,700	1.4	6,145	1.4	7,075	1.4	8,268	1.6	9,198	1.7
Laramie	68,649	14.6	73,142	16.1	81,607	16.5	86,916	16.7	89,268	16.7
Lincoln	12,177	2.6	12,625	2.8	14,573	3.0	16,466	3.2	17,868	3.3
Natrona	71,856	15.3	61,226	13.5	66,533	13.5	70,529	13.6	72,151	13.5
Niobrara	2,924	0.6	2,499	0.6	2,407	0.5	2,102	0.4	1,892	0.4
Park	21,639	4.6	23,178	5.1	25,786	5.2	27,747	5.3	28,760	5.4
Platte	11,975	2.6	8,145	1.8	8,807	1.8	8,804	1.7	8,760	1.6
Sheridan	25,048	5.3	23,562	5.2	26,560	5.4	28,805	5.5	30,336	5.7
Sublette	4,548	1.0	4,843	1.1	5,920	1.2	7,161	1.4	8,135	1.5
Sweetwater	41,723	8.9	38,823	8.6	37,613	7.6	35,567	6.8	32,759	6.1
Teton	9,355	2.0	11,172	2.5	18,251	3.7	22,352	4.3	26,671	5.0
Uinta	13,021	2.8	18,705	4.1	19,742	4.0	19,906	3.8	19,509	3.7
Washakie	9,496	2.0	8,388	1.8	8,289	1.7	7,668	1.5	7,501	1.4
Weston	7,106	1.5	6,518	1.4	6,644	1.3	6,669	1.3	6,509	1.2

Sources: U.S. Department of Commerce, Bureau of the Census (http://www.census.gov/). *1980, 1990, and 2000 Decennial Census Data; Population Estimates and Forecasts for Wyoming, counties, cities, and towns for 2000-2020,* from Wyoming Department of Administration and Information, Economic Analysis Division http://eadiv.state.wy.us/demog_data/demographic.html.

*Calculations based on *actual* population data.
**Calculations based on *projected* population data.

Appendix

Table A.2 Population Census and Projections by County, and Percent Change Over Time, Wyoming 1980 to 2020

	Percent Change of Population						
Area	**1980 - 1990***	**1990 - 2000***	**2000 - 2010****	**2010 - 2020****	**1980 - 2000***	**2000 - 2020*****	**1980 - 2020*****
Wyoming	**(3.4)**	**8.9**	**5.2**	**2.7**	**5.2**	**8.1**	**13.6**
Albany	6.0	4.0	0.6	(2.5)	10.2	(1.9)	8.1
BigHorn	(11.5)	8.9	(0.2)	(1.0)	(3.7)	(1.2)	(4.8)
Campbell	20.5	14.7	17.8	12.3	38.3	32.3	83.0
Carbon	(23.9)	(6.1)	(6.2)	(4.8)	(28.6)	(10.7)	(36.2)
Converse	(20.9)	8.3	6.9	4.0	(14.3)	11.1	(4.8)
Crook	(0.3)	11.2	5.7	3.2	10.9	9.0	20.9
Fremont	(13.7)	6.4	3.0	0.7	(8.2)	3.7	(4.8)
Goshen	2.8	1.3	(3.6)	(4.1)	4.1	(7.5)	(3.7)
Hot Springs	(15.8)	1.5	(6.7)	(3.6)	(14.5)	(10.1)	(23.1)
Johnson	(8.3)	15.1	16.9	11.2	5.6	30.0	37.3
Laramie	6.5	11.6	6.5	2.7	18.9	9.4	30.0
Lincoln	3.7	15.4	13.0	8.5	19.7	22.6	46.7
Natrona	(14.8)	8.7	6.0	2.3	(7.4)	8.4	0.4
Niobrara	(14.5)	(3.7)	(12.7)	(10.0)	(17.7)	(21.4)	(35.3)
Park	7.1	11.3	7.6	3.7	19.2	11.5	32.9
Platte	(32.0)	8.1	(0.0)	(0.5)	(26.5)	(0.5)	(26.8)
Sheridan	(5.9)	12.7	8.5	5.3	6.0	14.2	21.1
Sublette	6.5	22.2	21.0	13.6	30.2	37.4	78.9
Sweetwater	(7.0)	(3.1)	(5.4)	(7.9)	(9.9)	(12.9)	(21.5)
Teton	19.4	63.4	22.5	19.3	95.1	46.1	185.1
Uinta	43.7	5.5	0.8	(2.0)	51.6	(1.2)	49.8
Washakie	(11.7)	(1.2)	(7.5)	(2.2)	(12.7)	(9.5)	(21.0)
Weston	(8.3)	1.9	0.4	(2.4)	(6.5)	(2.0)	(8.4)

Sources: U.S. Department of Commerce, Bureau of the Census (http://www.census.gov/). *1980, 1990, and 2000 Decennial Census Data; Population Estimates and Forecasts for Wyoming, counties, cities, and towns for 2000-2020,* from Wyoming Department of Administration and Information, Economic Analysis Division http://eadiv.state.wy.us/demog_data/demographic.html.

Note: Parentheses indicate negative numbers.

*Calculations based on *actual* population data.
**Calculations based on *projected* population data.
***Calculations based on *actual* and *projected* population data.

Appendix

Table A.3 Working Age (15-54 years) Population Census and Projections by County, Wyoming 1980 to 2020

	1980*			1990*			2000*			2010**			2020**		
		Population Aged 15 to 54 Years			Population Aged 15 to 54 Years			Population Aged 15 to 54 Years			Population Aged 15 to 54 Years			Population Aged 15 to 54 Years	
AREA	Total Area Population	Number	Percent of Total	Total Area Population	Number	Percent of Total	Total Area Population	Number	Percent of Total	Total Area Population	Number	Percent of Total	Total Area Population	Number	Percent of Total
Wyoming	**469,557**	**276,582**	**58.9**	**453,588**	**256,589**	**56.6**	**493,782**	**288,056**	**58.4**	**519,595**	**278,250**	**53.6**	**533,534**	**263,330**	**49.4**
Albany	29,062	19,831	68.2	30,797	21,064	68.4	32,014	22,383	69.9	32,204	21,041	65.3	31,405	19,065	60.7
BigHorn	11,896	5,903	49.6	10,525	5,006	47.6	11,461	5,651	49.3	11,439	5,141	44.9	11,324	4,647	41.0
Campbell	24,367	15,513	63.7	29,370	17,825	60.7	33,698	21,454	63.7	39,701	23,018	58.0	44,595	23,838	53.5
Carbon	21,896	12,951	59.1	16,659	9,501	57	15,639	9,167	58.6	14,671	7,879	53.7	13,965	6,890	49.3
Converse	14,069	8,337	59.3	11,128	6,168	55.4	12,052	6,890	57.2	12,882	6,718	52.2	13,392	6,421	47.9
Crook	5,308	2,900	54.6	5,294	2,716	51.3	5,887	3,131	53.2	6,222	2,972	47.8	6,419	2,820	43.9
Fremont	38,992	22,814	58.5	33,662	17,826	53	35,804	19,465	54.4	36,872	18,221	49.4	37,135	16,829	45.3
Goshen	12,040	6,301	52.3	12,373	6,356	51.4	12,538	6,555	52.3	12,086	5,737	47.5	11,596	5,043	43.5
Hot Springs	5,710	2,899	50.8	4,809	2,385	49.6	4,882	2,389	48.9	4,555	1,991	43.7	4,391	1,747	39.8
Johnson	6,700	3,488	52.1	6,145	3,131	51	7,075	3,575	50.5	8,268	3,822	46.2	9,198	3,875	42.1
Laramie	68,649	40,564	59.1	73,142	42,430	58	81,607	47,843	58.6	86,916	47,112	54.2	89,268	44,864	50.3
Lincoln	12,177	6,208	51.0	12,625	6,439	51	14,573	7,816	53.6	16,466	7,984	48.5	17,868	7,934	44.4
Natrona	71,856	43,996	61.2	61,226	34,202	55.9	66,533	38,345	57.6	70,529	37,056	52.5	72,151	34,843	48.3
Niobrara	2,924	1,454	49.7	2,499	1,251	50.1	2,407	1,231	51.1	2,102	959	45.6	1,892	797	42.1
Park	21,639	12,247	56.6	23,178	12,656	54.6	25,786	14,307	55.5	27,747	14,041	50.6	28,760	13,356	46.4
Platte	11,975	6,837	57.1	8,145	4,175	51.3	8,807	4,586	52.1	8,804	4,188	47.6	8,760	3,815	43.6
Sheridan	25,048	13,781	55.0	23,562	12,648	53.7	26,560	14,707	55.4	28,805	14,642	50.8	30,336	14,052	46.3
Sublette	4,548	2,568	56.5	4,843	2,701	55.8	5,920	3,323	56.1	7,161	3,700	51.7	8,135	3,865	47.5
Sweetwater	41,723	24,967	59.8	38,823	22,514	58	37,613	23,007	61.2	35,567	19,946	56.1	32,759	16,915	51.6
Teton	9,355	6,482	69.3	11,172	7,305	65.4	18,251	12,470	68.3	22,352	14,326	64.1	26,671	15,829	59.3
Uinta	13,021	7,361	56.5	18,705	10,448	55.9	19,742	11,741	59.5	19,906	10,780	54.2	19,509	9,638	49.4
Washakie	9,496	5,227	55.0	8,388	4,378	52.2	8,289	4,340	52.4	7,668	3,641	47.5	7,501	3,265	43.5
Weston	7,106	3,953	55.6	6,518	3,464	53.1	6,644	3,680	55.4	6,669	3,329	49.9	6,509	2,979	45.8

Sources: U.S. Department of Commerce, Bureau of the Census (http://www.census.gov/). *1980, 1990, and 2000 Decennial Census Data; Population Estimates and Forecasts for Wyoming, counties, cities, and towns for 2000-2020,* from Wyoming Department of Administration and Information, Economic Analysis Division http://eadiv.state.wy.us/demog_data/demographic.html.

*Calculations based on *actual* population data.
**Calculations based on *projected* population data.

Appendix

Table A.4 Working Age (15-54 years) Population Census and Projections by County, and Percent Change Over Time, Wyoming 1980 to 2020

	Percent Change of Working Age (15-54 years) Population						
Area	**1980 - 1990***	**1990 - 2000***	**2000 - 2010****	**2010 - 2020****	**1980 - 2000***	**2000 - 2020*****	**1980 - 2020*****
Wyoming	**(7.2)**	**12.3**	**(3.4)**	**(5.4)**	**4.1**	**(8.6)**	**(4.8)**
Albany	6.2	6.3	(6.0)	(9.4)	12.9	(14.8)	(3.9)
BigHorn	(15.2)	12.9	(9.0)	(9.6)	(4.3)	(17.8)	(21.3)
Campbell	14.9	20.4	7.3	3.6	38.3	11.1	53.7
Carbon	(26.6)	(3.5)	(14.1)	(12.6)	(29.2)	(24.8)	(46.8)
Converse	(26.0)	11.7	(2.5)	(4.4)	(17.4)	(6.8)	(23.0)
Crook	(6.3)	15.3	(5.1)	(5.1)	8.0	(9.9)	(2.8)
Fremont	(21.9)	9.2	(6.4)	(7.6)	(14.7)	(13.5)	(26.2)
Goshen	0.9	3.1	(12.5)	(12.1)	4.0	(23.1)	(20.0)
Hot Springs	(17.7)	0.2	(16.7)	(12.3)	(17.6)	(26.9)	(39.7)
Johnson	(10.2)	14.2	6.9	1.4	2.5	8.4	11.1
Laramie	4.6	12.8	(1.5)	(4.8)	17.9	(6.2)	10.6
Lincoln	3.7	21.4	2.1	(0.6)	25.9	1.5	27.8
Natrona	(22.3)	12.1	(3.4)	(6.0)	(12.8)	(9.1)	(20.8)
Niobrara	(14.0)	(1.6)	(22.1)	(16.9)	(15.3)	(35.3)	(45.2)
Park	3.3	13.0	(1.9)	(4.9)	16.8	(6.6)	9.1
Platte	(38.9)	9.8	(8.7)	(8.9)	(32.9)	(16.8)	(44.2)
Sheridan	(8.2)	16.3	(0.4)	(4.0)	6.7	(4.5)	2.0
Sublette	5.2	23.0	11.3	4.5	29.4	16.3	50.5
Sweetwater	(9.8)	2.2	(13.3)	(15.2)	(7.9)	(26.5)	(32.3)
Teton	12.7	70.7	14.9	10.5	92.4	26.9	144.2
Uinta	41.9	12.4	(8.2)	(10.6)	59.5	(17.9)	30.9
Washakie	(16.2)	(0.9)	(16.1)	(10.3)	(17.0)	(24.8)	(37.5)
Weston	(12.4)	6.2	(9.5)	(10.5)	(6.9)	(19.0)	(24.6)

Sources: U.S. Department of Commerce, Bureau of the Census (http://www.census.gov/). *1980, 1990, and 2000 Decennial Census Data; Population Estimates and Forecasts for Wyoming, counties, cities, and towns for 2000-2020,* from Wyoming Department of Administration and Information, Economic Analysis Division http://eadiv.state.wy.us/demog_data/demographic.html.

Note: Parentheses indicate negative numbers.

*Calculations based on *actual* population data.
**Calculations based on *projected* population data.
***Calculations based on *actual* and *projected* population data.

Appendix

Table A.5 Elderly (aged 65 years and older) Population Census and Projections by County, Wyoming 1980 to 2020

	1980*			1990*			2000*			2010**			2020**		
		Population Aged 65 Years and Older			Population Aged 65 Years and Older			Population Aged 65 Years and Older			Population Aged 65 Years and Older			Population Aged 65 Years and Older	
AREA	Total Population	Number	Percent of Total	Total Population	Number	Percent of Total	Total Population	Number	Percent of Total	Total Population	Number	Percent of Total	Total Population	Number	Percent of Total
Wyoming	**469,557**	**37,175**	**7.9**	**453,588**	**47,195**	**10.4**	**493,782**	**57,786**	**11.7**	**519,595**	**70,631**	**13.6**	**533,534**	**96,962**	**18.2**
Albany	29,062	2,005	6.9	30,797	2,358	7.7	32,014	2,650	8.3	32,204	3,158	9.8	31,405	4,659	14.8
BigHorn	11,896	1,652	13.9	10,525	1,837	17.5	11,461	1,915	16.7	11,439	2,117	18.5	11,324	2,583	22.8
Campbell	24,367	693	2.8	29,370	1,094	3.7	33,698	1,789	5.3	39,701	3,215	8.1	44,595	5,743	12.9
Carbon	21,896	1,513	6.9	16,659	1,717	10.3	15,639	1,920	12.3	14,671	2,029	13.8	13,965	2,585	18.5
Converse	14,069	780	5.5	11,128	995	8.9	12,052	1,345	11.2	12,882	1,698	13.2	13,392	2,384	17.8
Crook	5,308	501	9.4	5,294	643	12.1	5,887	874	14.8	6,222	1,053	16.9	6,419	1,340	20.9
Fremont	38,992	2,728	7.0	33,662	3,873	11.5	35,804	4,757	13.3	36,872	5,623	15.3	37,135	7,306	19.7
Goshen	12,040	1,771	14.7	12,373	1,998	16.1	12,538	2,172	17.3	12,086	2,313	19.1	11,596	2,727	23.5
Hot Springs	5,710	930	16.3	4,809	900	18.7	4,882	978	20.0	4,555	994	21.8	4,391	1,149	26.2
Johnson	6,700	927	13.8	6,145	1,073	17.5	7,075	1,278	18.1	8,268	1,566	18.9	9,198	2,157	23.5
Laramie	68,649	6,023	8.8	73,142	7,553	10.3	81,607	9,355	11.5	86,916	11,548	13.3	89,268	15,707	17.6
Lincoln	12,177	1,003	8.2	12,625	1,265	10.0	14,573	1,814	12.4	16,466	2,308	14.0	17,868	3,288	18.4
Natrona	71,856	4,546	6.3	61,226	6,456	10.5	66,533	8,424	12.7	70,529	10,850	15.4	72,151	14,477	20.1
Niobrara	2,924	506	17.3	2,499	478	19.1	2,407	444	18.4	2,102	451	21.5	1,892	476	25.2
Park	21,639	2,244	10.4	23,178	3,076	13.3	25,786	3,747	14.5	27,747	4,496	16.2	28,760	5,966	20.7
Platte	11,975	1,082	9.0	8,145	1,276	15.7	8,807	1,442	16.4	8,804	1,569	17.8	8,760	1,943	22.2
Sheridan	25,048	2,984	11.9	23,562	3,527	15.0	26,560	4,121	15.5	28,805	4,941	17.2	30,336	6,737	22.2
Sublette	4,548	379	8.3	4,843	577	11.9	5,920	719	12.1	7,161	961	13.4	8,135	1,456	17.9
Sweetwater	41,723	2,068	5.0	38,823	2,785	7.2	37,613	3,009	8.0	35,567	3,502	9.8	32,759	4,817	14.7
Teton	9,355	486	5.2	11,172	723	6.5	18,251	1,288	7.1	22,352	1,855	8.3	26,671	3,542	13.3
Uinta	13,021	775	6.0	18,705	998	5.3	19,742	1,374	7.0	19,906	1,808	9.1	19,509	2,785	14.3
Washakie	9,496	922	9.7	8,388	1,165	13.9	8,289	1,323	16.0	7,668	1,374	17.9	7,501	1,676	22.3
Weston	7,106	657	9.2	6,518	828	12.7	6,644	1,047	15.8	6,669	1,202	18.0	6,509	1,459	22.4

Sources: U.S. Department of Commerce, Bureau of the Census (http://www.census.gov/). *1980, 1990, and 2000 Decennial Census Data; Population Estimates and Forecasts for Wyoming, counties, cities, and towns for 2000-2020,* from Wyoming Department of Administration and Information, Economic Analysis Division http://eadiv.state.wy.us/demog_data/demographic.html.

*Calculations based on *actual* population data.
**Calculations based on projected population data.

Appendix

Table A.6 Elderly (aged 65 years and older) Population Census and Projections by County, and Percent Change Over Time, Wyoming 1980 to 2020

	Percent Change of Elderly Population						
Area	**1980 - 1990***	**1990 - 2000***	**2000 - 2010****	**2010 - 2020****	**1980 - 2000***	**2000 - 2020*****	**1980 - 2020*****
Wyoming	**27.0**	**22.4**	**22.2**	**37.3**	**55.4**	**67.8**	**160.8**
Albany	17.6	12.4	19.2	47.5	32.2	75.8	132.4
BigHorn	11.2	4.2	10.5	22.0	15.9	34.9	56.4
Campbell	57.9	63.5	79.7	78.6	158.2	221.0	728.7
Carbon	13.5	11.8	5.7	27.4	26.9	34.6	70.9
Converse	27.6	35.2	26.2	40.4	72.4	77.2	205.6
Crook	28.3	35.9	20.5	27.3	74.5	53.3	167.5
Fremont	42.0	22.8	18.2	29.9	74.4	53.6	167.8
Goshen	12.8	8.7	6.5	17.9	22.6	25.6	54.0
Hot Springs	(3.2)	8.7	1.6	15.6	5.2	17.5	23.5
Johnson	15.7	19.1	22.5	37.7	37.9	68.8	132.7
Laramie	25.4	23.9	23.4	36.0	55.3	67.9	160.8
Lincoln	26.1	43.4	27.2	42.5	80.9	81.3	227.8
Natrona	42.0	30.5	28.8	33.4	85.3	71.9	218.5
Niobrara	(5.5)	(7.1)	1.6	5.5	(12.3)	7.2	(5.9)
Park	37.1	21.8	20.0	32.7	67.0	59.2	165.9
Platte	17.9	13.0	8.8	23.8	33.3	34.7	79.6
Sheridan	18.2	16.8	19.9	36.3	38.1	63.5	125.8
Sublette	52.2	24.6	33.7	51.5	89.7	102.5	284.2
Sweetwater	34.7	8.0	16.4	37.5	45.5	60.1	132.9
Teton	48.8	78.1	44.0	90.9	165.0	175.0	628.8
Uinta	28.8	37.7	31.6	54.0	77.3	102.7	259.4
Washakie	26.4	13.6	3.9	22.0	43.5	26.7	81.8
Weston	26.0	26.4	14.8	21.4	59.4	39.4	122.1

Sources: U.S. Department of Commerce, Bureau of the Census (http://www.census.gov/). *1980, 1990, and 2000 Decennial Census Data; Population Estimates and Forecasts for Wyoming, counties, cities, and towns for 2000-2020,* from Wyoming Department of Administration and Information, Economic Analysis Division http://eadiv.state.wy.us/demog_data/demographic.html.

Note: Parentheses indicate negative numbers.

*Calculations based on *actual* population data.
**Calculations based on *projected* population data.
***Calculations based on *actual* and *projected* population data.

Appendix

Table A.7 Youth (aged 19 years and younger) Population Census and Projections by County, Wyoming 1980 to 2020

	1980*			1990*			2000*			2010**			2020**		
		Population 19 Years and Younger			Population 19 Years and Younger			Population 19 Years and Younger			Population 19 Years and Younger			Population 19 Years and Younger	
AREA	Total Population	Number	Percent of Total	Total Population	Number	Percent of Total	Total Population	Number	Percent of Total	Total Population	Number	Percent of Total	Total Population	Number	Percent of Total
Wyoming	**469,557**	**163,845**	**34.9**	**453,588**	**149,121**	**32.9**	**493,782**	**145,417**	**29.4**	**519,595**	**144,415**	**27.8**	**533,534**	**144,156**	**27.0**
Albany	29,062	9,021	31.0	30,797	8,919	29.0	32,014	8,405	26.3	32,204	7,976	24.8	31,405	7,541	24.0
BigHorn	11,896	4,274	35.9	10,525	3,440	32.7	11,461	3,613	31.5	11,439	3,432	30.0	11,324	3,308	29.2
Campbell	24,367	9,326	38.3	29,370	11,196	38.1	33,698	11,582	34.4	39,701	12,886	32.5	44,595	14,144	31.7
Carbon	21,896	7,833	35.8	16,659	5,345	32.1	15,639	4,179	26.7	14,671	3,709	25.3	13,965	3,427	24.5
Converse	14,069	5,497	39.1	11,128	3,959	35.6	12,052	3,740	31.0	12,882	3,779	29.3	13,392	3,831	28.6
Crook	5,308	1,939	36.5	5,294	1,815	34.3	5,887	1,726	29.3	6,222	1,708	27.5	6,419	1,714	26.7
Fremont	38,992	14,425	37.0	33,662	11,398	33.9	35,804	10,965	30.6	36,872	10,678	29.0	37,135	10,475	28.2
Goshen	12,040	3,927	32.6	12,373	3,868	31.3	12,538	3,513	28.0	12,086	3,190	26.4	11,596	2,975	25.7
Hot Springs	5,710	1,779	31.2	4,809	1,361	28.3	4,882	1,190	24.4	4,555	1,047	23.0	4,391	976	22.2
Johnson	6,700	2,176	32.5	6,145	1,801	29.3	7,075	1,886	26.7	8,268	2,064	25.0	9,198	2,226	24.2
Laramie	68,649	22,962	33.4	73,142	22,446	30.7	81,607	23,325	28.6	86,916	23,420	26.9	89,268	23,410	26.2
Lincoln	12,177	5,018	41.2	12,625	5,102	40.4	14,573	4,939	33.9	16,466	5,302	32.2	17,868	5,625	31.5
Natrona	71,856	24,428	34.0	61,226	19,602	32.0	66,533	19,560	29.4	70,529	19,560	27.7	72,151	19,460	27.0
Niobrara	2,924	864	29.5	2,499	655	26.2	2,407	598	24.8	2,102	491	23.4	1,892	426	22.5
Park	21,639	7,337	33.9	23,178	7,297	31.5	25,786	7,251	28.1	27,747	7,329	26.4	28,760	7,387	25.7
Platte	11,975	4,047	33.8	8,145	2,523	31.0	8,807	2,438	27.7	8,804	2,300	26.1	8,760	2,225	25.4
Sheridan	25,048	8,013	32.0	23,562	6,968	29.6	26,560	7,167	27.0	28,805	7,304	25.4	30,336	7,458	24.6
Sublette	4,548	1,619	35.6	4,843	1,477	30.5	5,920	1,645	27.8	7,161	1,868	26.1	8,135	2,066	25.4
Sweetwater	41,723	15,706	37.6	38,823	14,318	36.9	37,613	12,179	32.4	35,567	11,004	30.9	32,759	9,893	30.2
Teton	9,355	2,506	26.8	11,172	2,910	26.0	18,251	3,999	21.9	22,352	4,513	20.2	26,671	5,211	19.5
Uinta	13,021	5,154	39.6	18,705	7,917	42.3	19,742	7,266	36.8	19,906	7,022	35.3	19,509	6,738	34.5
Washakie	9,496	3,486	36.7	8,388	2,729	32.5	8,289	2,457	29.6	7,668	2,153	28.1	7,501	2,050	27.3
Weston	7,106	2,508	35.3	6,518	2,075	31.8	6,644	1,791	27.0	6,669	1,680	25.2	6,509	1,589	24.4

Sources: U.S. Department of Commerce, Bureau of the Census (http://www.census.gov/). *1980, 1990, and 2000 Decennial Census Data; Population Estimates and Forecasts for Wyoming, counties, cities, and towns for 2000-2020,* from Wyoming Department of Administration and Information, Economic Analysis Division http://eadiv.state.wy.us/demog_data/demographic.html.

*Calculations based on *actual* population data.
**Calculations based on projected population data.

Appendix

Table A.8 Youth (aged 19 years and younger) Population Census and Projections by County, and Percent Change over Time, Wyoming 1980 to 2020

	Percent Change of Youth Population						
Area	**1980 - 1990***	**1990 - 2000***	**2000 - 2010****	**2010 - 2020****	**1980 - 2000***	**2000 - 2020*****	**1980 - 2020*****
Wyoming	**(9.0)**	**(2.5)**	**(0.7)**	**(0.2)**	**(11.2)**	**(0.9)**	**(12.0)**
Albany	(1.1)	(5.8)	(5.1)	(5.5)	(6.8)	(10.3)	(16.4)
BigHorn	(19.5)	5.0	(5.0)	(3.6)	(15.5)	(8.4)	(22.6)
Campbell	20.1	3.4	11.3	9.8	24.2	22.1	51.7
Carbon	(31.8)	(21.8)	(11.2)	(7.6)	(46.6)	(18.0)	(56.2)
Converse	(28.0)	(5.5)	1.0	1.4	(32.0)	2.4	(30.3)
Crook	(6.4)	(4.9)	(1.0)	0.4	(11.0)	(0.7)	(11.6)
Fremont	(21.0)	(3.8)	(2.6)	(1.9)	(24.0)	(4.5)	(27.4)
Goshen	(1.5)	(9.2)	(9.2)	(6.7)	(10.5)	(15.3)	(24.2)
Hot Springs	(23.5)	(12.6)	(12.0)	(6.8)	(33.1)	(18.0)	(45.1)
Johnson	(17.2)	4.7	9.4	7.8	(13.3)	18.0	2.3
Laramie	(2.2)	3.9	0.4	(0.0)	1.6	0.4	2.0
Lincoln	1.7	(3.2)	7.3	6.1	(1.6)	13.9	12.1
Natrona	(19.8)	(0.2)	0.0	(0.5)	(19.9)	(0.5)	(20.3)
Niobrara	(24.2)	(8.7)	(17.9)	(13.2)	(30.8)	(28.8)	(50.7)
Park	(0.5)	(0.6)	1.1	0.8	(1.2)	1.9	0.7
Platte	(37.7)	(3.4)	(5.7)	(3.3)	(39.8)	(8.7)	(45.0)
Sheridan	(13.0)	2.9	1.9	2.1	(10.6)	4.1	(6.9)
Sublette	(8.8)	11.4	13.6	10.6	1.6	25.6	27.6
Sweetwater	(8.8)	(14.9)	(9.6)	(10.1)	(22.5)	(18.8)	(37.0)
Teton	16.1	37.4	12.9	15.5	59.6	30.3	107.9
Uinta	53.6	(8.2)	(3.4)	(4.0)	41.0	(7.3)	30.7
Washakie	(21.7)	(10.0)	(12.4)	(4.8)	(29.5)	(16.6)	(41.2)
Weston	(17.3)	(13.7)	(6.2)	(5.4)	(28.6)	(11.3)	(36.6)

Sources: U.S. Department of Commerce, Bureau of the Census (http://www.census.gov/). *1980, 1990, and 2000 Decennial Census Data; Population Estimates and Forecasts for Wyoming, counties, cities, and towns for 2000-2020,* from Wyoming Department of Administration and Information, Economic Analysis Division http://eadiv.state.wy.us/demog_data/demographic.html.

Note: Parentheses indicate negative numbers.

*Calculations based on *actual* population data.
**Calculations based on *projected* population data.
***Calculations based on *actual* and *projected* population data.

Table A.9 Racial Minority (any race) and Hispanic Ethnicity, Population Census and Projections by County, Wyoming 1980 to 1990

		1980*											
		All Races				White				†Racial Minority			
		Non-Hispanic		Hispanic		Non-Hispanic		Hispanic		Non-Hispanic		Hispanic	
AREA	Total Area Population	Number	Percent Total	Number	Percent Total	Number	Percent Total	Number	Percent Total	Number	Percent Total	Number	Percent Total
Wyoming	**469,557**	**445,058**	**94.8**	**24,499**	**5.2**	**431,935**	**92.0**	**14,553**	**3.1**	**13,123**	**2.8**	**9,946**	**2.1**
Albany	29,062	27,192	93.6	1,870	6.4	26,347	90.7	1,152	4.0	845	2.9	718	2.5
BigHorn	11,896	11,441	96.2	455	3.8	11,340	95.3	328	2.8	101	0.8	127	1.1
Campbell	24,367	23,742	97.4	625	2.6	23,428	96.1	361	1.5	314	1.3	264	1.1
Carbon	21,896	19,430	88.7	2,466	11.3	19,014	86.8	1,338	6.1	416	1.9	1,128	5.2
Converse	14,069	13,372	95.0	697	5.0	13,219	94.0	460	3.3	153	1.1	237	1.7
Crook	5,308	5,289	99.6	19	0.4	5,262	99.1	12	0.2	27	0.5	7	0.1
Fremont	38,992	37,728	96.8	1,264	3.2	33,245	85.3	541	1.4	4,483	11.5	723	1.9
Goshen	12,040	11,143	92.5	897	7.5	11,064	91.9	330	2.7	79	0.7	567	4.7
Hot Springs	5,710	5,623	98.5	87	1.5	5,495	96.2	69	1.2	128	2.2	18	0.3
Johnson	6,700	6,608	98.6	92	1.4	6,552	97.8	66	1.0	56	0.8	26	0.4
Laramie	68,649	62,024	90.3	6,625	9.7	58,966	85.9	4,161	6.1	3,058	4.5	2,464	3.6
Lincoln	12,177	11,887	97.6	290	2.4	11,788	96.8	202	1.7	99	0.8	88	0.7
Natrona	71,856	69,306	96.5	2,550	3.5	67,925	94.5	1,469	2.0	1,381	1.9	1,081	1.5
Niobrara	2,924	2,897	99.1	27	0.9	2,887	98.7	18	0.6	10	0.3	9	0.3
Park	21,639	20,858	96.4	781	3.6	20,697	95.6	436	2.0	161	0.7	345	1.6
Platte	11,975	11,402	95.2	573	4.8	11,313	94.5	403	3.4	89	0.7	170	1.4
Sheridan	25,048	24,576	98.1	472	1.9	24,228	96.7	312	1.2	348	1.4	160	0.6
Sublette	4,548	4,509	99.1	39	0.9	4,485	98.6	30	0.7	24	0.5	9	0.2
Sweetwater	41,723	38,476	92.2	3,247	7.8	37,519	89.9	2,204	5.3	957	2.3	1,043	2.5
Teton	9,355	9,223	98.6	132	1.4	9,132	97.6	105	1.1	91	1.0	27	0.3
Uinta	13,021	12,618	96.9	403	3.1	12,526	96.2	255	2.0	92	0.7	148	1.1
Washakie	9,496	8,686	91.5	810	8.5	8,578	90.3	247	2.6	108	1.1	563	5.9
Weston	7,106	7,028	98.9	78	1.1	6,925	97.5	54	0.8	103	1.4	24	0.3

		1990*											
		All Races				White				†Racial Minority			
		Non-Hispanic		Hispanic		Non-Hispanic		Hispanic		Non-Hispanic		Hispanic	
AREA	Total Area Population	Number	Percent Total	Number	Percent Total	Number	Percent Total	Number	Percent Total	Number	Percent Total	Number	Percent Total
Wyoming	**453,588**	**427,837**	**94.3**	**25,751**	**5.7**	**412,711**	**91.0**	**14,350**	**3.2**	**15,126**	**3.3**	**11,401**	**2.5**
Albany	30,797	28,809	93.5	1,988	6.5	27,714	90.0	1,115	3.6	1,095	3.6	873	2.8
BigHorn	10,525	9,974	94.8	551	5.2	9,895	94.0	314	3.0	79	0.8	237	2.3
Campbell	29,370	28,488	97.0	882	3.0	28,074	95.6	578	2.0	414	1.4	304	1.0
Carbon	16,659	14,344	86.1	2,315	13.9	14,050	84.3	1,064	6.4	294	1.8	1,251	7.5
Converse	11,128	10,563	94.9	565	5.1	10,411	93.6	305	2.7	152	1.4	260	2.3
Crook	5,294	5,268	99.5	26	0.5	5,238	98.9	20	0.4	30	0.6	6	0.1
Fremont	33,662	32,326	96.0	1,336	4.0	26,273	78.0	493	1.5	6,053	18.0	843	2.5
Goshen	12,373	11,295	91.3	1,078	8.7	11,171	90.3	579	4.7	124	1.0	499	4.0
Hot Springs	4,809	4,742	98.6	67	1.4	4,626	96.2	34	0.7	116	2.4	33	0.7
Johnson	6,145	6,067	98.7	78	1.3	6,004	97.7	53	0.9	63	1.0	25	0.4
Laramie	73,142	65,832	90.0	7,310	10.0	62,410	85.3	3,870	5.3	3,422	4.7	3,440	4.7
Lincoln	12,625	12,373	98.0	252	2.0	12,266	97.2	165	1.3	107	0.8	87	0.7
Natrona	61,226	58,974	96.3	2,252	3.7	57,888	94.5	1,435	2.3	1,086	1.8	817	1.3
Niobrara	2,499	2,463	98.6	36	1.4	2,434	97.4	15	0.6	29	1.2	21	0.8
Park	23,178	22,353	96.4	825	3.6	22,112	95.4	468	2.0	241	1.0	357	1.5
Platte	8,145	7,741	95.0	404	5.0	7,708	94.6	349	4.3	33	0.4	55	0.7
Sheridan	23,562	23,118	98.1	444	1.9	22,789	96.7	306	1.3	329	1.4	138	0.6
Sublette	4,843	4,786	98.8	57	1.2	4,698	97.0	52	1.1	88	1.8	5	0.1
Sweetwater	38,823	35,353	91.1	3,470	8.9	34,529	88.9	2,035	5.2	824	2.1	1,435	3.7
Teton	11,172	11,014	98.6	158	1.4	10,864	97.2	125	1.1	150	1.3	33	0.3
Uinta	18,705	17,932	95.9	773	4.1	17,725	94.8	553	3.0	207	1.1	220	1.2
Washakie	8,388	7,587	90.5	801	9.5	7,490	89.3	374	4.5	97	1.2	427	5.1
Weston	6,518	6,435	98.7	83	1.3	6,342	97.3	48	0.7	93	1.4	35	0.5

Sources: U.S. Department of Commerce, Bureau of the Census (http://www.census.gov/). *1980 and 1990 Decennial Census Data.* 1980 data from GeoLytics, Inc., *CensusCD 1980 Short and Long Form* (www.GeoLytics.com).

Note: Hispanic ethnicity includes Mexican, Puerto Rican, Cuban and Hispanic Other.
Note: "All Races" denotes all Hispanic and non-Hispanic whites and racial minorities (any race).
Note: "White; Hispanic" denotes whites alone of Hispanic origin.
Note: "White; Non-Hispanic" denotes whites alone, not of Hispanic origin.
Note: "Racial Minority; Hispanic" denotes racial minorities (any race) alone of Hispanic origin.
Note: "Racial Minority; Non-Hispanic" denotes racial minorities (any race) alone, not of Hispanic origin.

*Calculations based on *actual* population data.
†Racial minorities include: Black, Native American (American Indian, Eskimo, Aleut), Japanese, Asian (Chinese, Filipino, Korean, Asian Indian), Native Hawaiian or Other Pacific Islander (Guam, Somoan), Some Other Race, and Two or More Races.

Table A.10 Racial Minority (any race) and Hispanic Ethnicity, Population Census and Projections by County, Wyoming 2000 to 2005

	2000*											
		All Races				White				†Racial Minority			
		Non-Hispanic		Hispanic		Non-Hispanic		Hispanic		Non-Hispanic		Hispanic	
AREA	Total Area Population	Number	Percent Total	Number	Percent Total	Number	Percent Total	Number	Percent Total	Number	Percent Total	Number	Percent Total
Wyoming	**493,782**	**462,113**	**93.6**	**31,669**	**6.4**	**438,799**	**88.9**	**15,871**	**3.2**	**23,314**	**4.7**	**15,798**	**3.2**
Albany	32,014	29,617	92.5	2,397	7.5	28,003	87.5	1,232	3.8	1,614	5.0	1,165	3.6
BigHorn	11,461	10,754	93.8	707	6.2	10,527	91.9	250	2.2	227	2.0	457	4.0
Campbell	33,698	32,507	96.5	1,191	3.5	31,701	94.1	668	2.0	806	2.4	523	1.6
Carbon	15,639	13,476	86.2	2,163	13.8	12,892	82.4	1,200	7.7	584	3.7	963	6.2
Converse	12,052	11,392	94.5	660	5.5	11,072	91.9	344	2.9	320	2.7	316	2.6
Crook	5,887	5,833	99.1	54	0.9	5,729	97.3	32	0.5	104	1.8	22	0.4
Fremont	35,804	34,238	95.6	1,566	4.4	26,693	74.6	695	1.9	7,545	21.1	871	2.4
Goshen	12,538	11,431	91.2	1,107	8.8	11,172	89.1	592	4.7	259	2.1	515	4.1
Hot Springs	4,882	4,766	97.6	116	2.4	4,614	94.5	71	1.5	152	3.1	45	0.9
Johnson	7,075	6,927	97.9	148	2.1	6,771	95.7	94	1.3	156	2.2	54	0.8
Laramie	81,607	72,710	89.1	8,897	10.9	67,901	83.2	4,662	5.7	4,809	5.9	4,235	5.2
Lincoln	14,573	14,258	97.8	315	2.2	14,002	96.1	155	1.1	256	1.8	160	1.1
Natrona	66,533	63,276	95.1	3,257	4.9	61,023	91.7	1,621	2.4	2,253	3.4	1,636	2.5
Niobrara	2,407	2,371	98.5	36	1.5	2,337	97.1	23	1.0	34	1.4	13	0.5
Park	25,786	24,827	96.3	959	3.7	24,356	94.5	516	2.0	471	1.8	443	1.7
Platte	8,807	8,342	94.7	465	5.3	8,181	92.9	290	3.3	161	1.8	175	2.0
Sheridan	26,560	25,914	97.6	646	2.4	25,122	94.6	343	1.3	792	3.0	303	1.1
Sublette	5,920	5,808	98.1	112	1.9	5,709	96.4	62	1.0	99	1.7	50	0.8
Sweetwater	37,613	34,068	90.6	3,545	9.4	32,675	86.9	1,786	4.7	1,393	3.7	1,759	4.7
Teton	18,251	17,066	93.5	1,185	6.5	16,668	91.3	413	2.3	398	2.2	772	4.2
Uinta	19,742	18,687	94.7	1,055	5.3	18,210	92.2	411	2.1	477	2.4	644	3.3
Washakie	8,289	7,338	88.5	951	11.5	7,143	86.2	335	4.0	195	2.4	616	7.4
Weston	6,644	6,507	97.9	137	2.1	6,298	94.8	76	1.1	209	3.1	61	0.9

	2005**											
	All Races					White				†Racial Minority			
		Non-Hispanic		Hispanic		Non-Hispanic		Hispanic		Non-Hispanic		Hispanic	
AREA	Total Area Population	Number	Percent Total	Number	Percent Total	Number	Percent Total	Number	Percent Total	Number	Percent Total	Number	Percent Total
Wyoming	**509,294**	**475,030**	**93.3**	**34,264**	**6.7**	**451,205**	**88.6**	**31,833**	**6.3**	**23,825**	**4.7**	**2,431**	**0.5**
Albany	30,890	28,783	93.2	2,107	6.8	27,102	87.7	1,965	6.4	1,681	5.4	142	0.5
BigHorn	11,333	10,618	93.7	715	6.3	10,431	92.0	678	6.0	187	1.7	37	0.3
Campbell	37,405	35,799	95.7	1,606	4.3	34,796	93.0	1,480	4.0	1,003	2.7	126	0.3
Carbon	15,331	13,334	87.0	1,997	13.0	12,814	83.6	1,948	12.7	520	3.4	49	0.3
Converse	12,766	12,176	95.4	590	4.6	11,924	93.4	556	4.4	252	2.0	34	0.3
Crook	6,182	6,114	98.9	68	1.1	6,027	97.5	62	1.0	87	1.4	6	0.1
Fremont	36,491	34,725	95.2	1,766	4.8	26,916	73.8	1,348	3.7	7,809	21.4	418	1.1
Goshen	12,243	11,134	90.9	1,109	9.1	10,934	89.3	1,076	8.8	200	1.6	33	0.3
Hot Springs	4,537	4,421	97.4	116	2.6	4,293	94.6	106	2.3	128	2.8	10	0.2
Johnson	7,721	7,547	97.7	174	2.3	7,418	96.1	163	2.1	129	1.7	11	0.1
Laramie	85,163	75,859	89.1	9,304	10.9	70,714	83.0	8,567	10.1	5,145	6.0	737	0.9
Lincoln	15,999	15,567	97.3	432	2.7	15,294	95.6	405	2.5	273	1.7	27	0.2
Natrona	69,799	66,314	95.0	3,485	5.0	63,977	91.7	3,204	4.6	2,337	3.3	281	0.4
Niobrara	2,286	2,249	98.4	37	1.6	2,228	97.5	36	1.6	21	0.9	1	0.0
Park	26,664	25,579	95.9	1,085	4.1	25,126	94.2	1,044	3.9	453	1.7	41	0.2
Platte	8,619	8,130	94.3	489	5.7	8,045	93.3	447	5.2	85	1.0	42	0.5
Sheridan	27,389	26,672	97.4	717	2.6	25,884	94.5	658	2.4	788	2.9	59	0.2
Sublette	6,926	6,736	97.3	190	2.7	6,635	95.8	177	2.6	101	1.5	13	0.2
Sweetwater	37,975	33,980	89.5	3,995	10.5	32,508	85.6	3,755	9.9	1,472	3.9	240	0.6
Teton	19,032	17,070	89.7	1,962	10.3	16,718	87.8	1,906	10.0	352	1.8	56	0.3
Uinta	19,939	18,748	94.0	1,191	6.0	18,295	91.8	1,154	5.8	453	2.3	37	0.2
Washakie	7,933	6,958	87.7	975	12.3	6,767	85.3	947	11.9	191	2.4	28	0.4
Weston	6,671	6,517	97.7	154	2.3	6,359	95.3	151	2.3	158	2.4	3	0.0

Sources: U.S. Department of Commerce, Bureau of the Census (http://www.census.gov/). *2000 Decennial Census Data and 2005 Population Estimates.* 2005 data from Wyoming Economic Analysis Division (http://eadiv.state.wy.us).

Note: Hispanic ethnicity includes: Mexican, Puerto Rican, Cuban and Hispanic Other.
Note: "All Races" denotes all Hispanic and non-Hispanic whites and racial minorities (any race).
Note: "White; Hispanic" denotes whites alone of Hispanic origin.
Note: "White; Non-Hispanic" denotes whites alone, not of Hispanic origin.
Note: "Racial Minority; Hispanic" denotes racial minorities (any race) alone of Hispanic origin.
Note: "Racial Minority; Non-Hispanic" denotes racial minorities (any race) alone, not of Hispanic origin.

*Calculations based on *actual* population data.
**Calculations based on population *estimates* and *projections*.
†Racial minorities include: Black, Native American (American Indian, Eskimo, Aleut), Japanese, Asian (Chinese, Filipino, Korean, Asian Indian), Native Hawaiian or Other Pacific Islander (Guam, Somoan), Some Other Race, and Two or More Races.

Table A.11 Racial Minority Population Census and Projections by County, and Percent Change Over Time, Wyoming 1980 to 2005

	1980 - 1990*						1990 - 2000*						2000 - 2005**					
	All Races		White		†Racial Minority		All Races		White		†Racial Minority		All Races		White		†Racial Minority	
AREA	Non-Hispanic	Hispanic	Non-Hispanic	Hispanic	Non-Hispanic	Hispanic	Non-Hispanic	Hispanic	Non-Hispanic	Hispanic	Non-Hispanic	Hispanic	Non-Hispanic	Hispanic	Non-Hispanic	Hispanic	Non-Hispanic	Hispanic
Wyoming	**(3.9)**	**5.1**	**(4.5)**	**(1.4)**	**15.3**	**14.6**	**8.0**	**23.0**	**6.3**	**10.6**	**54.1**	**38.6**	**2.8**	**8.2**	**2.8**	**100.6**	**2.2**	**(84.6)**
Albany	5.9	6.3	5.2	(3.2)	29.6	21.6	2.8	20.6	1.0	10.5	47.4	33.4	(2.8)	(12.1)	(3.2)	59.5	4.2	(87.8)
BigHorn	(12.8)	21.1	(12.7)	(4.3)	(21.8)	86.6	7.8	28.3	6.4	(20.4)	187.3	92.8	(1.3)	1.1	(0.9)	171.2	(17.6)	(91.9)
Campbell	20.0	41.1	19.8	60.1	31.8	15.2	14.1	35.0	12.9	15.6	94.7	72.0	10.1	34.8	9.8	121.6	24.4	(75.9)
Carbon	(26.2)	(6.1)	(26.1)	(20.5)	(29.3)	10.9	(6.1)	(6.6)	(8.2)	12.8	98.6	(23.0)	(1.1)	(7.7)	(0.6)	62.3	(11.0)	(94.9)
Converse	(21.0)	(18.9)	(21.2)	(33.7)	(0.7)	9.7	7.8	16.8	6.3	12.8	110.5	21.5	6.9	(10.6)	7.7	61.6	(21.3)	(89.2)
Crook	(0.4)	36.8	(0.5)	66.7	11.1	(14.3)	10.7	107.7	9.4	60.0	246.7	266.7	4.8	25.9	5.2	93.8	(16.3)	(72.7)
Fremont	(14.3)	5.7	(21.0)	(8.9)	35.0	16.6	5.9	17.2	1.6	41.0	24.6	3.3	1.4	12.8	0.8	94.0	3.5	(52.0)
Goshen	1.4	20.2	1.0	75.5	57.0	(12.0)	1.2	2.7	0.0	2.2	108.9	3.2	(2.6)	0.2	(2.1)	81.8	(22.8)	(93.6)
Hot Springs	(15.7)	(23.0)	(15.8)	(50.7)	(9.4)	83.3	0.5	73.1	(0.3)	108.8	31.0	36.4	(7.2)	0.0	(7.0)	49.3	(15.8)	(77.8)
Johnson	(8.2)	(15.2)	(8.4)	(19.7)	12.5	(3.8)	14.2	89.7	12.8	77.4	147.6	116.0	9.0	17.6	9.6	73.4	(17.3)	(79.6)
Laramie	6.1	10.3	5.8	(7.0)	11.9	39.6	10.4	21.7	8.8	20.5	40.5	23.1	4.3	4.6	4.1	83.8	7.0	(82.6)
Lincoln	4.1	(13.1)	4.1	(18.3)	8.1	(1.1)	15.2	25.0	14.2	(6.1)	139.3	83.9	9.2	37.1	9.2	161.3	6.6	(83.1)
Natrona	(14.9)	(11.7)	(14.8)	(2.3)	(21.4)	(24.4)	7.3	44.6	5.4	13.0	107.5	100.2	4.8	7.0	4.8	97.7	3.7	(82.8)
Niobrara	(15.0)	33.3	(15.7)	(16.7)	190.0	133.3	(3.7)	0.0	(4.0)	53.3	17.2	(38.1)	(5.1)	2.8	(4.7)	56.5	(38.2)	(92.3)
Park	7.2	5.6	6.8	7.3	49.7	3.5	11.1	16.2	10.1	10.3	95.4	24.1	3.0	13.1	3.2	102.3	(3.8)	(90.7)
Platte	(32.1)	(29.5)	(31.9)	(13.4)	(62.9)	(67.6)	7.8	15.1	6.1	(16.9)	387.9	218.2	(2.5)	5.2	(1.7)	54.1	(47.2)	(76.0)
Sheridan	(5.9)	(5.9)	(5.9)	(1.9)	(5.5)	(13.8)	12.1	45.5	10.2	12.1	140.7	119.6	2.9	11.0	3.0	91.8	(0.5)	(80.5)
Sublette	6.1	46.2	4.7	73.3	266.7	(44.4)	21.4	96.5	21.5	19.2	12.5	900.0	16.0	69.6	16.2	185.5	2.0	(74.0)
Sweetwater	(8.1)	6.9	(8.0)	(7.7)	(13.9)	37.6	(3.6)	2.2	(5.4)	(12.2)	69.1	22.6	(0.3)	12.7	(0.5)	110.2	5.7	(86.4)
Teton	19.4	19.7	19.0	19.0	64.8	22.2	54.9	650.0	53.4	230.4	165.3	2,239.4	0.0	65.6	0.3	361.5	(11.6)	(92.7)
Uinta	42.1	91.8	41.5	116.9	125.0	48.6	4.2	36.5	2.7	(25.7)	130.4	192.7	0.3	12.9	0.5	180.8	(5.0)	(94.3)
Washakie	(12.7)	(1.1)	(12.7)	51.4	(10.2)	(24.2)	(3.3)	18.7	(4.6)	(10.4)	101.0	44.3	(5.2)	2.5	(5.3)	182.7	(2.1)	(95.5)
Weston	(8.4)	6.4	(8.4)	(11.1)	(9.7)	45.8	1.1	65.1	(0.7)	58.3	124.7	74.3	0.2	12.4	1.0	98.7	(24.4)	(95.1)

Table A.11 continues on next page

Table A.11 Racial Minority Population Census and Projections by County, and Percent Change Over Time, Wyoming 1980 to 2005 (continued)

	1980 - 2000*						1980 - 2005**					
	All Races		White		†Racial Minority		All Races		White		†Racial Minority	
AREA	Non-Hispanic	Hispanic	Non-Hispanic	Hispanic	Non-Hispanic	Hispanic	Non-Hispanic	Hispanic	Non-Hispanic	Hispanic	Non-Hispanic	Hispanic
Wyoming	**3.8**	**29.3**	**1.6**	**9.1**	**77.7**	**58.8**	**6.7**	**39.9**	**4.5**	**118.7**	**81.6**	**(75.6)**
Albany	8.9	28.2	6.3	6.9	91.0	62.3	5.9	12.7	2.9	70.6	98.9	(80.2)
BigHorn	(6.0)	55.4	(7.2)	(23.8)	124.8	259.8	(7.2)	57.1	(8.0)	106.7	85.1	(70.9)
Campbell	36.9	90.6	35.3	85.0	156.7	98.1	50.8	157.0	48.5	310.0	219.4	(52.3)
Carbon	(30.6)	(12.3)	(32.2)	(10.3)	40.4	(14.6)	(31.4)	(19.0)	(32.6)	45.6	25.0	(95.7)
Converse	(14.8)	(5.3)	(16.2)	(25.2)	109.2	33.3	(8.9)	(15.4)	(9.8)	20.9	64.7	(85.7)
Crook	10.3	184.2	8.9	166.7	285.2	214.3	15.6	257.9	14.5	416.7	222.2	(14.3)
Fremont	(9.3)	23.9	(19.7)	28.5	68.3	20.5	(8.0)	39.7	(19.0)	149.2	74.2	(42.2)
Goshen	2.6	23.4	1.0	79.4	227.8	(9.2)	(0.1)	23.6	(1.2)	226.1	153.2	(94.2)
Hot Springs	(15.2)	33.3	(16.0)	2.9	18.8	150.0	(21.4)	33.3	(21.9)	53.6	0.0	(44.4)
Johnson	4.8	60.9	3.3	42.4	178.6	107.7	14.2	89.1	13.2	147.0	130.4	(57.7)
Laramie	17.2	34.3	15.2	12.0	57.3	71.9	22.3	40.4	19.9	105.9	68.2	(70.1)
Lincoln	19.9	8.6	18.8	(23.3)	158.6	81.8	31.0	49.0	29.7	100.5	175.8	(69.3)
Natrona	(8.7)	27.7	(10.2)	10.3	63.1	51.3	(4.3)	36.7	(5.8)	118.1	69.2	(74.0)
Niobrara	(18.2)	33.3	(19.1)	27.8	240.0	44.4	(22.4)	37.0	(22.8)	100.0	110.0	(88.9)
Park	19.0	22.8	17.7	18.3	192.5	28.4	22.6	38.9	21.4	139.4	181.4	(88.1)
Platte	(26.8)	(18.8)	(27.7)	(28.0)	80.9	2.9	(28.7)	(14.7)	(28.9)	10.9	(4.5)	(75.3)
Sheridan	5.4	36.9	3.7	9.9	127.6	89.4	8.5	51.9	6.8	110.9	126.4	(63.1)
Sublette	28.8	187.2	27.3	106.7	312.5	455.6	49.4	387.2	47.9	490.0	320.8	44.4
Sweetwater	(11.5)	9.2	(12.9)	(19.0)	45.6	68.6	(11.7)	23.0	(13.4)	70.4	53.8	(77.0)
Teton	85.0	797.7	82.5	293.3	337.4	2,759.3	85.1	1,386.4	83.1	1,715.2	286.8	107.4
Uinta	48.1	161.8	45.4	61.2	418.5	335.1	48.6	195.5	46.1	352.5	392.4	(75.0)
Washakie	(15.5)	17.4	(16.7)	35.6	80.6	9.4	(19.9)	20.4	(21.1)	283.4	76.9	(95.0)
Weston	(7.4)	75.6	(9.1)	40.7	102.9	154.2	(7.3)	97.4	(8.2)	179.6	53.4	(87.5)

Sources: U.S. Department of Commerce, Bureau of the Census (http://www.census.gov/). *1980, 1990, 2000 Decennial Census Data and 2005 Population Estimates.* 1980 data from GeoLytics, Inc., *CensusCD 1980 Short and Long Form;* and *Estimates, Projections, Consumer Expenditures and Profiles 2003/2008* (www.GeoLytics.com). 2005 data from Wyoming Economic Analysis Division (http://eadiv.state.wy.us).

Note: Parentheses indicate negative numbers.
Note: Hispanic ethnicity includes: Mexican, Puerto Rican, Cuban and Hispanic Other.
Note: "All Races" denotes all Hispanic and non-Hispanic whites and racial minorities (any race).
Note: "White; Hispanic" denotes whites alone of Hispanic origin.
Note: "White; Non-Hispanic" denotes whites alone, not of Hispanic origin.
Note: "Racial Minority; Hispanic" denotes racial minorities (any race) alone of Hispanic origin.
Note: "Racial Minority; Non-Hispanic" denotes racial minorities (any race) alone, not of Hispanic origin.

*Calculations based on *actual* population data.
**Calculations based on *projected* population data.
***Calculations based on *actual* and *projected* population data.
†Racial minorities include: Black, Native American (American Indian, Eskimo, Aleut), Japanese, Asian (Chinese, Filipino, Korean, Asian Indian), Native Hawaiian or Other Pacific Islander (Guam, Somoan), Some Other Race, and Two or More Races.

Table A.12 Racial Minority (any race) and Hispanic Ethnicity, Population Projections by County, Wyoming 2009

	2009								
		Hispanic (all races)		White Non-Hispanic		White (Hispanic and non-Hispanic)		† Racial Minority (Hispanic and non-Hispanic)	
AREA	Total Area Population	Number	Percent Total	Number	Percent Total	Number	Percent Total	Number	Percent Total
Wyoming	**516,994**	**40,221**	**7.8**	**418,582**	**81.0**	**459,342**	**1,142**	**57,652**	**11.2**
Albany	31,342	3,003	9.6	26,702	85.2	27,447	914	3,895	12.4
BigHorn	11,066	856	7.7	9,191	83.1	10,026	1,171	1,040	9.4
Campbell	40,844	1,731	4.2	33,505	82.0	38,352	2,216	2,492	6.1
Carbon	14,693	2,400	16.3	11,762	80.1	12,620	526	2,073	14.1
Converse	13,271	876	6.6	10,626	80.1	12,164	1,389	1,107	8.3
Crook	6,176	68	1.1	5,338	86.4	5,957	8,760	219	3.5
Fremont	37,132	1,987	5.4	24,674	66.4	26,321	1,325	10,811	29.1
Goshen	11,737	1,242	10.6	9,847	83.9	10,659	858	1,078	9.2
Hot Springs	4,434	133	3.0	3,863	87.1	4,165	3,132	269	6.1
Johnson	8,102	205	2.5	6,828	84.3	7,732	3,772	370	4.6
Laramie	87,002	11,819	13.6	67,970	78.1	73,574	623	13,428	15.4
Lincoln	15,895	397	2.5	13,214	83.1	15,186	3,825	709	4.5
Natrona	69,776	4,238	6.1	57,890	83.0	63,656	1,502	6,120	8.8
Niobrara	2,132	42	2.0	1,975	92.6	2,065	4,917	67	3.1
Park	26,841	1,212	4.5	23,546	87.7	25,400	2,096	1,441	5.4
Platte	8,808	560	6.4	7,184	81.6	8,298	1,482	510	5.8
Sheridan	28,249	823	2.9	24,333	86.1	26,476	3,217	1,773	6.3
Sublette	7,078	162	2.3	5,960	84.2	6,800	4,198	278	3.9
Sweetwater	36,294	4,179	11.5	28,206	77.7	31,710	759	4,584	12.6
Teton	21,377	1,639	7.7	16,974	79.4	19,307	1,178	2,070	9.7
Uinta	20,201	1,325	6.6	16,616	82.3	18,438	1,392	1,763	8.7
Washakie	7,637	1,072	14.0	5,987	78.4	6,495	606	1,142	15.0
Weston	6,907	252	3.6	6,391	92.5	6,494	2,577	413	6.0

Sources: U.S. Department of Commerce, Bureau of the Census (http://www.census.gov/). 2009 projection data from *Estimates, Projections, Consumer Expenditures and Profiles 2004/2009,* GeoLytics, Inc. (www.GeoLytics.com).

Note: Due to the use of different methodology used to calculate 2009 projections, the following categories are not reported: "White, Hispanic," "Racial Minority, Non-Hispanic," "Racial Minority Hispanic," and "All Races, Non-Hispanic." The data for "White Non-Hispanic" and " White (alone)" are not correlated and should be looked at independent of each other. The "Total Racial Minority (alone)" category is tabulated based on race alone without consideration for ethnicity.

Note: Hispanic Ethnicity includes: Mexican, Puerto Rican, Cuban and Hispanic Other.
Note: "All Races" denotes all Hispanic and non-Hispanic whites and racial minorities (any race).
Note: "White; Non-Hispanic" denotes whites alone, not of Hispanic origin.
Note: "Racial Minority (Hispanic and Non-Hispanic)" denotes racial minorities (any race) of either Hispanic or non-Hispanic origin.

Table A.13 Education Attainment, Residents Aged 25 Years and Older, Population Census by County and Percent Change Over Time, Wyoming 1980 to 2000

	1980			1990			2000					
	Total Population Aged 25 Years and Older	High School Degree or Higher		Total Population Aged 25 Years and Older	High School Degree or Higher		Total Population Aged 25 Years and Older	High School Degree or Higher		Percent Change for Education Attainment		
AREA		Number	Percent of Total		Number	Percent of Total		Number	Percent of Total	1980 - 1990	1990 - 2000	1980 - 2000
Wyoming	**255,149**	**198,761**	**77.9**	**277,769**	**230,548**	**83.0**	**315,663**	**277,468**	**87.9**	**16.0**	**20.4**	**39.6**
Niobrara	1,843	363	19.7	1,760	1,332	75.7	1,731	1,511	87.3	267.0	13.4	316.2
Goshen	7,151	4,999	69.9	7,885	6,032	76.5	8,406	7,120	84.7	20.7	18.0	42.4
Hot Springs	3,477	2,444	70.3	3,302	2,513	76.1	3,515	2,960	84.2	2.8	17.8	21.1
BigHorn	6,803	4,817	70.8	6,687	5,156	77.1	7,343	6,109	83.2	7.0	18.5	26.8
Crook	2,942	2,124	72.2	3,317	2,644	79.7	3,888	3,336	85.8	24.5	26.2	57.0
Weston	3,944	2,867	72.7	4,171	3,470	83.2	4,554	3,880	85.2	21.0	11.8	35.3
Fremont	20,816	15,196	73.0	20,645	16,000	77.5	23,053	19,549	84.8	5.3	22.2	28.6
Platte	6,883	5,059	73.5	5,321	4,241	79.7	6,034	5,123	84.9	(16.2)	20.8	1.3
Lincoln	6,222	4,654	74.8	7,058	5,872	83.2	9,049	7,954	87.9	26.2	35.5	70.9
Carbon	11,671	8,788	75.3	10,471	8,555	81.7	10,508	8,774	83.5	(2.7)	2.6	(0.2)
Washakie	2,614	1,968	75.3	5,432	4,280	78.8	5,460	4,674	85.6	117.5	9.2	137.4
Johnson	4044	3,069	75.9	4,127	3,293	79.8	4,981	4,488	90.1	7.3	36.3	46.2
Converse	7,094	5,399	76.1	6,746	5,626	83.4	7,818	6,755	86.4	4.2	20.1	25.1
Sheridan	14,943	11,402	76.3	15,630	12,754	81.6	17,980	15,894	88.4	11.9	24.6	39.4
Sweetwater	21,228	16,197	76.3	22,533	18,364	81.5	23,053	20,148	87.4	13.4	9.7	24.4
Uinta	6,459	5,025	77.8	9,931	8,352	84.1	11,443	9,704	84.8	66.2	16.2	93.1
Park	12,407	9,665	77.9	14,705	12,146	82.6	17,145	15,019	87.6	25.7	23.7	55.4
Sublette	2,593	2,028	78.2	3,187	2,683	84.2	4,044	3,599	89.0	32.3	34.1	77.5
Campbell	11,715	9,384	80.1	16,740	14,480	86.5	20,107	17,754	88.3	54.3	22.6	89.2
Laramie	38,447	30,796	80.1	45,754	38,525	84.2	53,041	47,260	89.1	25.1	22.7	53.5
Natrona	39,579	32,653	82.5	38,433	32,783	85.3	42,656	37,665	88.3	0.4	14.9	15.4
Albany	13,929	11,798	84.7	16,297	14,553	89.3	17,016	15,910	93.5	23.4	9.3	34.9
Teton	5,696	5,149	90.4	7,637	7,018	91.9	12,838	12,158	94.7	36.3	73.2	136.1

Source: U.S. Department of Commerce, Bureau of the Census (http://www.census.gov/). *1980, 1990, and 2000 Decennial Census Data* from Wyoming Department of Administration and Information, Economic Analysis Division http://eadiv.state.wy.us/demog_data/demographic.html.

Note: Parentheses indicate negative numbers.

Appendix

Table A.14 Residents below the Federal Poverty Level, Population Census by County and Percent Change Over Time, Wyoming 1980 to 2000

	1980			1990			2000			Percent Change for Number Below the Federal Poverty Level		
AREA	Total Population for whom Poverty Status is Determined	Number Below Poverty Level	Percent Below Poverty Level	Total Population for whom Poverty Status is Determined	Number Below Poverty Level	Percent Below Poverty Level	Total Population for whom Poverty Status is Determined	Number Below Poverty Level	Percent Below Poverty Level	1980 - 1990	1990 - 2000	1980 - 2000
Wyoming	**459,732**	**36,268**	**7.9**	**442,277**	**52,453**	**11.9**	**479,485**	**54,777**	**11.4**	**44.6**	**4.4**	**51.0**
Albany	26208	4083	15.6	28,009	5,532	19.8	29652	6228	21.0	35.5	12.6	52.5
BigHorn	11802	1499	12.7	10,316	1,696	16.4	11227	1583	14.1	13.1	(6.7)	5.6
Campbell	24161	1168	4.8	28,977	2,439	8.4	33421	2544	7.6	108.8	4.3	117.8
Carbon	21339	1420	6.7	15,787	1,579	10.0	14595	1879	12.9	11.2	19.0	32.3
Converse	13975	890	6.4	10,986	1,311	11.9	11934	1379	11.6	47.3	5.2	54.9
Crook	5299	524	9.9	5,231	707	13.5	5790	529	9.1	34.9	(25.2)	1.0
Fremont	38224	3625	9.5	32,861	6,268	19.1	34975	6155	17.6	72.9	(1.8)	69.8
Goshen	11791	1400	11.9	12,109	2,077	17.2	12085	1677	13.9	48.4	(19.3)	19.8
Hot Springs	5498	411	7.5	4,632	493	10.6	4737	504	10.6	20.0	2.2	22.6
Johnson	6573	548	8.3	5,984	770	12.9	7029	712	10.1	40.5	(7.5)	29.9
Laramie	67357	5421	8.0	71,501	7,566	10.6	78087	7104	9.1	39.6	(6.1)	31.0
Lincoln	12155	1393	11.5	12,571	1,354	10.8	14435	1295	9.0	(2.8)	(4.4)	(7.0)
Natrona	71016	4087	5.8	60,346	6,979	11.6	65011	7695	11.8	70.8	10.3	88.3
Niobrara	2894	464	16.0	2,378	404	17.0	2301	309	13.4	(12.9)	(23.5)	(33.4)
Park	20994	1755	8.4	22,425	2,127	9.5	24983	3182	12.7	21.2	49.6	81.3
Platte	11894	1159	9.7	8,065	1,267	15.7	8701	1021	11.7	9.3	(19.4)	(11.9)
Sheridan	24375	1482	6.1	22,953	2,376	10.4	25817	2775	10.7	60.3	16.8	87.2
Sublette	4533	441	9.7	4,747	398	8.4	5824	565	9.7	(9.8)	42.0	28.1
Sweetwater	41355	2167	5.2	38,424	3,080	8.0	36943	2871	7.8	42.1	(6.8)	32.5
Teton	9293	713	7.7	11,097	905	8.2	18121	1089	6.0	26.9	20.3	52.7
Uinta	12669	491	3.9	18,303	1,583	8.6	19360	1913	9.9	222.4	20.8	289.6
Washakie	9292	605	6.5	8,152	914	11.2	8091	1140	14.1	51.1	24.7	88.4
Weston	7035	522	7.4	6,423	628	9.8	6366	628	9.9	20.3	0.0	20.3

Source: U.S. Department of Commerce, Bureau of the Census (http://www.census.gov/). *1980, 1990, and 2000 Decennial Census Data* from Wyoming Department of Administration and Information, Economic Analysis Division http://eadiv.state.wy.us/demog_data/demographic.html.

Note: Parentheses indicate negative numbers.

Appendix

Table A.15 Unemployment, Civilian Labor Force, Population Census by County and Percent Change Over Time, Wyoming 1980 to 2000

	1980			1990			2000					
	Total in	Unemployed		Total in	Unemployed		Total in	Unemployed		Percent Change for Number Unemployed		
AREA	Civilian Labor Force	Number Unemployed	Percent Unemployed	Civilian Labor Force	Number Unemployed	Percent Unemployed	Civilian Labor Force	Number Unemployed	Percent Unemployed	1980 - 1990	1990 - 2000	1980 - 2000
Wyoming	**226,762**	**9,388**	**4.1**	**220,980**	**9,686**	**4.38**	**254,508**	**7,022**	**2.76**	**3.2**	**(27.5)**	**(33.4)**
Albany	13,867	669	4.8	15,705	778	4.95	18,157	989	5.45	16.3	27.1	12.9
BigHorn	5,138	200	3.9	4,277	226	5.28	5,125	325	6.34	13.0	43.8	62.9
Campbell	12,876	359	2.8	15,327	796	5.19	18,805	830	4.41	121.7	4.3	58.3
Carbon	10,346	340	3.3	8,031	429	5.34	7,744	409	5.28	26.2	(4.7)	60.7
Converse	6,880	286	4.2	5,467	396	7.24	6,239	288	4.62	38.5	(27.3)	11.0
Crook	2,380	101	4.2	2,508	97	3.87	2,937	98	3.34	(4.0)	1.0	(21.4)
Fremont	18,276	847	4.6	15,177	1,432	9.44	17,614	1,562	8.87	69.1	9.1	91.3
Goshen	5,367	214	4.0	5,854	449	7.67	6,088	392	6.44	109.8	(12.7)	61.5
Hot Springs	2,611	68	2.6	2,328	112	4.81	2,472	45	1.82	64.7	(59.8)	(30.1)
Johnson	1,141	120	10.5	3,055	83	2.72	3,451	209	6.06	(30.8)	151.8	(42.4)
Laramie	32,002	1,693	5.3	35,265	2,351	6.67	38,864	1,915	4.93	38.9	(18.5)	(6.9)
Lincoln	5,045	301	6.0	5,346	309	5.78	6,763	257	3.80	2.7	(16.8)	(36.3)
Natrona	38,068	1,341	3.5	30,385	1,994	6.56	35,024	1,811	5.17	48.7	(9.2)	46.8
Niobrara	1,299	21	1.6	1,137	25	2.20	1,193	40	3.35	19.0	60.0	107.4
Park	10,484	406	3.9	11,435	654	5.72	12,985	652	5.02	61.1	(0.3)	29.7
Platte	5,599	256	4.6	3,755	183	4.87	4,530	196	4.33	(28.5)	7.1	(5.4)
Sheridan	11,680	482	4.1	11,486	697	6.07	13,884	618	4.45	44.6	(11.3)	7.9
Sublette	2,095	56	2.7	2,417	87	3.60	3,185	152	4.77	55.4	74.7	78.5
Sweetwater	20,307	783	3.9	19,093	978	5.12	19,988	1,143	5.72	24.9	16.9	48.3
Teton	5,855	459	7.8	6,765	132	1.95	12,040	353	2.93	(71.2)	167.4	(62.6)
Uinta	5,868	129	2.2	8,814	506	5.74	10,022	642	6.41	292.2	26.9	191.4
Washakie	4,470	172	3.8	3,946	194	4.92	4,219	350	8.30	12.8	80.4	115.6
Weston	3,207	85	2.7	3,181	204	6.41	3,179	177	5.57	140.0	(13.2)	110.1

Source: U.S. Department of Commerce, Bureau of the Census (http://www.census.gov/). *1980, 1990, and 2000 Decennial Census Data* from Wyoming Department of Administration and Information, Economic Analysis Division http://eadiv.state.wy.us/demog_data/demographic.html.

Note: Parentheses indicate negative numbers.

Appendix B. Health Professional Shortage Area Criteria

Primary Medical Care Shortage Criteria

Part I -- Geographic Areas

A. Criteria. A geographic area will be designated as having a shortage of primary medical care professionals if the following three criteria are met:

1. The area is a rational area for the delivery of primary medical care services.
2. One of the following conditions prevails within the area:
    (a) The area has a population to full-time-equivalent primary care physician ratio of at least 3,500:1.
    (b) The area has a population to full-time-equivalent primary care physician ratio of less than 3,500:1 but greater than 3,000:1 and has unusually high needs for primary care services or insufficient capacity of existing primary care providers.
3. Primary medical care professionals in contiguous areas are overutilized, excessively distant, or inaccessible to the population of the area under consideration.

B. Methodology. In determining whether an area meets the criteria established by paragraph A of this part, the following methodology will be used:

1. Rational Areas for the Delivery of Primary Medical Care Services.
    (a) The following areas will be considered rational areas for the delivery of primary medical care services:
        (i) A county, or a group of contiguous counties whose population centers are within 30 minutes travel time of each other.
        (ii) A portion of a county, or an area made up of portions of more than one county, whose population, because of topography, market or transportation patterns, distinctive population characteristics or other factors, has limited access to contiguous area resources, as measured generally by a travel time greater than 30 minutes to such resources.
        (iii) Established neighborhoods and communities within metropolitan areas which display a strong self-identity (as indicated by a homogeneous socioeconomic or demographic structure and/or a tradition of interaction or interdependency), have limited interaction with contiguous areas, and which, in general, have a minimum population of 20,000.
    (b) The following distances will be used as guidelines in determining distances corresponding to 30 minutes travel time:
        (i) Under normal conditions with primary roads available: 20 miles.
        (ii) In mountainous terrain or in areas with only secondary roads available: 15 miles.
        (iii) In flat terrain or in areas connected by interstate highways: 25 miles.
        Within inner portions of metropolitan areas, information on the public transportation system will be used to determine the distance corresponding to 30 minutes travel time.
2. Population Count. The population count used will be the total permanent resident civilian population of the area, excluding inmates of institutions with the following adjustments, where appropriate:
    (a) The effect of transient populations on the need of an area for primary care professional(s) will be taken into account as follows:
        (i) Seasonal residents, i.e., those who maintain a residence in the area but inhabit it for only 2 to 8 months per year, may be included but must be weighted in proportion to the fraction of the year they are present in the area.

(ii) Other tourists (non-resident) may be included in an area's population but only with a weight of 0.25, using the following formula: Effective tourist contribution to population = 0.25 x (fraction of year tourists are present in area) x (average daily number of tourists during portion of year that tourists are present).

(iii) Migratory workers and their families may be included in an area's population, using the following formula: Effective migrant contribution to population = (fraction of year migrants are present in area) x (average daily number of migrants during portion of year that migrants are present).

3. Counting of Primary Care Practitioners.

(a) All non-Federal doctors of medicine (M.D.) and doctors of osteopathy (D.O.) providing direct patient care who practice principally in one of the four primary care specialties -- general or family practice, general internal medicine, pediatrics, and obstetrics and gynecology -- will be counted. Those physicians engaged solely in administration, research, and teaching will be excluded. Adjustments for the following factors will be made in computing the number of full-time-equivalent (FTE) primary care physicians:

(i) Interns and residents will be counted as 0.1 full-time equivalent (FTE) physicians.

(ii) Graduates of foreign medical schools who are not citizens or lawful permanent residents of the United States will be excluded from physician counts.

(iii) Those graduates of foreign medical schools who are citizens or lawful permanent residents of the United States, but do not have unrestricted licenses to practice medicine, will be counted as 0.5 FTE physicians.

(b) Practitioners who are semi-retired, who operate a reduced practice due to infirmity or other limiting conditions, or who provide patient care services to the residents of the area only on a part-time basis will be discounted through the use of full-time equivalency figures. A 40-hour work week will be used as the standard for determining full-time equivalents in these cases. For practitioners working less than a 40-hour week, every four (4) hours (or 1/2 day) spent providing patient care, in either ambulatory or inpatient settings, will be counted as 0.1 FTE (with numbers obtained for FTE's rounded to the nearest 0.1 FTE), and each physician providing patient care 40 or more hours a week will be counted as 1.0 FTE physician. (For cases where data are available only for the number of hours providing patient care in office settings, equivalencies will be provided in guidelines.)

(c) In some cases, physicians located within an area may not be accessible to the population of the area under consideration. Allowances for physicians with restricted practices can be made, on a case-by-case basis. However, where only a portion of the population of the area cannot access existing primary care resources in the area, a population group designation may be more appropriate (see part II of this appendix).

(d) Hospital staff physicians involved exclusively in inpatient care will be excluded. The number of full-time equivalent physicians practicing in organized outpatient departments and primary care clinics will be included, but those in emergency rooms will be excluded.

(e) Physicians who are suspended under provisions of the Medicare-Medicaid Anti-Fraud and Abuse Act for a period of eighteen months or more will be excluded.

4. Determination of Unusually High Needs for Primary Medical Care Services.

An area will be considered as having unusually high needs for primary health care services if at least one of the following criteria is met:

(a) The area has more than 100 births per year per 1,000 women aged 15 - 44.

(b) The area has more than 20 infant deaths per 1,000 live births.

(c) More than 20% of the population (or of all households) have incomes below the poverty level.

5. Determination of Insufficient Capacity of Existing Primary Care Providers.

An area's existing primary care providers will be considered to have insufficient capacity if at least two of the following criteria are met:

(a) More than 8,000 office or outpatient visits per year per FTE primary care physician serving the area.

(b) Unusually long waits for appointments for routine medical services (i.e., more than 7 days for established patients and 14 days for new patients).
(c) Excessive average waiting time at primary care providers (longer than one hour where patients have appointments or two hours where patients are treated on a first-come, first-served basis).
(d) Evidence of excessive use of emergency room facilities for routine primary care.
(e) A substantial proportion (2/3 or more) of the area's physicians do not accept new patients.
(f) Abnormally low utilization of health services, as indicated by an average of 2.0 or less office visits per year on the part of the area's population.

6. Contiguous Area Considerations. Primary care professional(s) in areas contiguous to an area being considered for designation will be considered excessively distant, overutilized or inaccessible to the population of the area under consideration if one of the following conditions prevails in each contiguous area:

(a) Primary care professional(s) in the contiguous area are more than 30 minutes travel time from the population center(s) of the area being considered for designation (measured in accordance with paragraph B.1(b) of this part).
(b) The contiguous area population-to-full-time-equivalent primary care physician ratio is in excess of 2000:1, indicating that practitioners in the contiguous area cannot be expected to help alleviate the shortage situation in the area being considered for designation.
(c) Primary care professional(s) in the contiguous area are inaccessible to the population of the area under consideration because of specified access barriers, such as:

(i) Significant differences between the demographic (or socio-economic) characteristics of the area under consideration and those of the contiguous area, indicating that the population of the area under consideration may be effectively isolated from nearby resources. This isolation could be indicated, for example, by an unusually high proportion of non-English-speaking persons.
(ii) A lack of economic access to contiguous area resources, as indicated particularly where a very high proportion of the population of the area under consideration is poor (i.e., where more than 20 percent of the population or the households have incomes below the poverty level), and Medicaid-covered or public primary care services are not available in the contiguous area.

Part II -- Population Groups

A. Criteria.

1. In general, specific population groups within particular geographic areas will be designated as having a shortage of primary medical care professional(s) if the following three criteria are met:

(a) The area in which they reside is rational for the delivery of primary medical care services, as defined in paragraph B.1 of part I of this appendix.
(b) Access barriers prevent the population group from use of the area's primary medical care providers. Such barriers may be economic, linguistic, cultural, or architectural, or could involve refusal of some providers to accept certain types of patients or to accept Medicaid reimbursement.
(c) The ratio of the number of persons in the population group to the number of primary care physicians practicing in the area and serving the population group is at least 3,000:1.

2. Indians and Alaska Natives will be considered for designation as having shortages of primary care professional(s) as follows:

(a) Groups of members of Indian tribes (as defined in section 4(d) of Pub. L. 94 - 437, the Indian Health Care Improvement Act of 1976) are automatically designated.
(b) Other groups of Indians or Alaska Natives (as defined in section 4(c) of Pub. L. 94 - 437) will be designated if the general criteria in paragraph A are met.

Part III – Facilities

A. Federal and State Correctional Institutions.

1. Criteria. Medium to maximum security Federal and State correctional institutions and youth detention facilities will be designated as having a shortage of primary medical care professional(s) if both the following criteria are met:

(a) The institution has at least 250 inmates.

(b) The ratio of the number of internees per year to the number of FTE primary care physicians serving the institution is at least 1,000:1.

Here the number of internees is defined as follows:

(i) If the number of new inmates per year and the average length-of-stay (ALOS) are not specified, or if the information provided does not indicate that intake medical examinations are routinely performed upon entry, then -- Number of internees = average number of inmates.

(ii) If the ALOS is specified as one year or more, and intake medical examinations are routinely performed upon entry, then -- Number of internees = average number of inmates + (0.3) x number of new inmates per year.

(iii) If the ALOS is specified as less than one year, and intake examinations are routinely performed upon entry, then -- Number of internees = average number of inmates + (0.2) x (1+ALOS/2) x number of new inmates per year where ALOS = average length-of-stay (in fraction of year). (The number of FTE primary care physicians is computed as in part I, section B, paragraph 3 above.)

B. Public or Non-Profit Medical Facilities.

1. Criteria. Public or non-profit private medical facilities will be designated as having a shortage of primary medical care professional(s) if:

(a) the facility is providing primary medical care services to an area or population group designated as having a primary care professional(s) shortage; and

(b) the facility has insufficient capacity to meet the primary care needs of that area or population group.

2. Methodology. In determining whether public or nonprofit private medical facilities meet the criteria established by paragraph B.1 of this Part, the following methodology will be used:

(a) Provision of Services to a Designated Area or Population Group.

A facility will be considered to be providing services to a designated area or population group if either:

(i) A majority of the facility's primary care services are being provided to residents of designated primary care professional(s) shortage areas or to population groups designated as having a shortage of primary care professional(s); or

(ii) The population within a designated primary care shortage area or population group has reasonable access to primary care services provided at the facility. Reasonable access will be assumed if the area within which the population resides lies within 30 minutes travel time of the facility and non-physical barriers (relating to demographic and socioeconomic characteristics of the population) do not prevent the population from receiving care at the facility.

Migrant health centers (as defined in section 319(a)(1) of the Act) which are located in areas with designated migrant population groups and Indian Health Service facilities are assumed to be meeting this requirement.

(b) Insufficient capacity to meet primary care needs.

A facility will be considered to have insufficient capacity to meet the primary care needs of the area or population it serves if at least two of the following conditions exist at the facility:

(i) There are more than 8,000 outpatient visits per year per FTE primary care physician on the staff of the facility. (Here the number of FTE primary care physicians is computed as in Part I, Section B, paragraph 3 above.)

(ii) There is excessive usage of emergency room facilities for routine primary care.
(iii) Waiting time for appointments is more than 7 days for established patients or more than 14 days for new patients, for routine health services.
(iv) Waiting time at the facility is longer than 1 hour where patients have appointments or 2 hours where patients are treated on a first-come, first-served basis.
[45 FR 76000, Nov. 17, 1980, as amended at 54 FR 8737, Mar. 2, 1989; 57 FR 2480, Jan. 22, 1992]

Dental Designation Criteria

Part I -- Geographic Areas

A. Criteria. A geographic area will be designated as having a dental professional shortage if the following three criteria are met:

1. The area is a rational area for the delivery of dental services.
2. One of the following conditions prevails in the area:
   (a) The area has a population to full-time-equivalent dentist ratio of at least 5,000:1, or
   (b) The area has a population to full-time-equivalent dentist ratio of less than 5,000:1 but greater than 4,000:1 and has unusually high needs for dental services or insufficient capacity of existing dental providers.
3. Dental professionals in contiguous areas are overutilized, excessively distant, or inaccessible to the population of the area under consideration.

B. Methodology. In determining whether an area meets the criteria established by paragraph A of this part, the following methodology will be used:

1. Rational Area for the Delivery of Dental Services.
(a) The following areas will be considered rational areas for the delivery of dental health services:
(i) A county, or a group of several contiguous counties whose population centers are within 40 minutes travel time of each other.
(ii) A portion of a county (or an area made up of portions of more than one county) whose population, because of topography, market or transportation patterns, distinctive population characteristics, or other factors, has limited access to contiguous area resources, as measured generally by a travel time of greater than 40 minutes to such resources.
(iii) Established neighborhoods and communities within metropolitan areas which display a strong self-identity (as indicated by a homogenous socioeconomic or demographic structure and/or a traditional of interaction or intradependency), have limited interaction with contiguous areas, and which, in general, have a minimum population of 20,000.
(b) The following distances will be used as guidelines in determining distances corresponding to 40 minutes travel time:
(i) Under normal conditions with primary roads available: 25 miles.
(ii) In mountainous terrain or in areas with only secondary roads available: 20 miles.
(iii) In flat terrain or in areas connected by interstate highways: 30 miles.
Within inner portions of metropolitan areas, information on the public transportation system will be used to determine the distance corresponding to 40 minutes travel time.

2. Population Count. The population count use will be the total permanent resident civilian population of the area, excluding inmates of institutions, with the following adjustments:
(a) Seasonal residents, i.e., those who maintain a residence in the area but inhabit it for only 2 to 8 months per year, may be included but must be weighted in proportion to the fraction of the year they are present in the area.

(b) Migratory workers and their families may be included in an area's population using the following formula: Effective migrant contribution to population = (fraction of year migrants are present in area) x (average daily number of migrants during portion of year that migrants are present).

3. Counting of Dental Practitioners.

(a) All non-Federal dentists providing patient care will be counted, except in those areas where it is shown that specialists (those dentists not in general practice or pedodontics) are serving a larger area and are not addressing the general dental care needs of the area under consideration.

(b) Full-time equivalent (FTE) figures will be used to reflect productivity differences among dental practices based on the age of the dentists, the number of auxiliaries employed, and the number of hours worked per week. In general, the number of FTE dentists will be computed using weights obtained from the matrix in Table 1, which is based on the productivity of dentists at various ages, with different numbers of auxiliaries, as compared with the average productivity of all dentists. For the purposes of these determinations, an auxiliary is defined as any non-dentist staff employed by the dentist to assist in operation of the practice.

TABLE 1 - EQUIVALENCY WEIGHTS, BY AGE AND NUMBER OF AUXILIARIES

	<55	55-59	60-64	65+
No auxiliaries	**0.8**	**0.7**	**0.6**	**0.5**
One auxiliary	**1.0**	**0.9**	**0.8**	**0.7**
Two auxiliaries	**1.2**	**1.0**	**1.0**	**0.8**
Three auxiliaries	**1.4**	**1.2**	**1.0**	**1.0**
Four auxiliaries	**1.5**	**1.5**	**1.3**	**1.2**

If information on the number of auxiliaries employed by the dentist is not available, Table 2 will be used to compute the number of full-time equivalent dentists.

TABLE 2 - EQUIVALENCY WEIGHTS, BY AGE

	<55	55-59	60-64	65+
Equivalency Weights	**1.2**	**0.9**	**0.8**	**0.6**

The number of FTE dentists within a particular age group (or age/auxiliary group) will be obtained by multiplying the number of dentists within that group by its corresponding equivalency weight. The total supply of FTE dentists within an area is then computed as the sum of those dentists within each age (or age/auxiliary) group.

(c) The equivalency weights specified in tables 1 and 2 assume that dentists within a particular group are working full-time (40 hours per week). Where appropriate data are available, adjusted equivalency figures for dentists who are semi-retired, who operate a reduced practice due to infirmity or other limiting conditions, or who are available to the population of an area only on a part-time basis will be used to reflect the reduced availability of these dentists. In computing these equivalency figures, every 4 hours (or 1/2 day) spent in the dental practice will be counted as 0.1 FTE except that each dentist working more than 40 hours a week will be counted as 1.0. The count obtained for a particular age group of dentists will then be multiplied by the appropriate equivalency weight from table 1 or 2 to obtain a full-time equivalent figure for dentists within that particular age orage/auxiliary category.

4. Determination of Unusually High Needs for Dental Services. An area will be considered as having unusually high needs for dental services if at least one of the following criteria is met:

(a) More than 20% of the population (or of all households) has incomes below the poverty level.

(b) The majority of the area's population does not have a fluoridated water supply.

5. Determination of Insufficient Capacity of Existing Dental Care Providers. An area's existing dental care providers will be considered to have insufficient capacity if at least two of the following criteria are met:

(a) More than 5,000 visits per year per FTE dentist serving the area.

(b) Unusually long waits for appointments for routine dental services (i.e., more than 6 weeks).

(c) A substantial proportion (2/3 or more) of the area's dentists do not accept new patients.

*6. Contiguous Area Considerations.*Dental professional(s) in areas contiguous to an area being considered for designation will be considered excessively distant, over utilized or inaccessible to the population of the area under consideration if one of the following conditions prevails in each contiguous area:

(a) Dental professional(s) in the contiguous area are more than 40 minutes travel time from the center of the area being considered for designation (measured in accordance with Paragraph B.1.(b) of this part).

(b) Contiguous area population-to-(FTE) dentist ratios are in excess of 3,000:1, indicating that resources in contiguous areas cannot be expected to help alleviate the shortage situation in the area being considered for designation.

(c) Dental professional(s) in the contiguous area are inaccessible to the population of the area under consideration because of specified access barriers, such as:

(i) Significant differences between the demographic (or socioeconomic) characteristics of the area under consideration and those of the contiguous area, indicating that the population of the area under consideration may be effectively

isolated from nearby resources. Such isolation could be indicated, for example, by an unusually high proportion of non-English-speaking persons.
(ii) A lack of economic access to contiguous area resources, particularly where a very high proportion of the population of the area under consideration is poor (i.e., where more than 20 percent of the population or of the households have incomes below the poverty level) and Medicaid-covered or public dental services are not available in the contiguous area.

Part II -- Population Groups

A. Criteria.

1. In general, specified population groups within particular geographic areas will be designated as having a shortage of dental care professional(s) if the following three criteria are met:

a. The area in which they reside is rational for the delivery of dental care services, as defined in paragraph B.1 of part I of this appendix.
b. Access barriers prevent the population group from use of the area's dental providers.
c. The ratio (R) of the number of persons in the population group to the number of dentists practicing in the area and serving the population group is at least 4,000:1.

2. Indians and Alaska Natives will be considered for designation as having shortages of dental professional(s) as follows:

(a) Groups of members of Indian tribes (as defined in section 4(d) of Pub. L. 94 - 437, the Indian Health Care Improvement Act of 1976) are automatically designated.
(b) Other groups of Indians or Alaska Natives (as defined in section 4(c) of Pub. L. 94 - 437) will be designated if the general criteria in paragraph 1 are met.

Part III – Facilities

A. Federal and State Correctional Institutions.

1. Criteria. Medium to maximum security Federal and State correctional institutions and youth detention facilities will be designated as having a shortage of dental professional(s) if both the following criteria are met:

(a) The institution has at least 250 inmates.
(b) The ratio of the number of internees per year to the number of FTE dentists serving the institution is at least 1,500:1.
Here the number of internees is defined as follows:

(i) If the number of new inmates per year and the average length-of-stay (ALOS) are not specified, or if the information provided does not indicate that intake dental examinations are routinely performed by dentists upon entry, then -- Number of internees = average number of inmates.
(ii) If the ALOS is specified as one year or more, and intake dental examinations are routinely performed upon entry, then -- Number of internees = average number of inmates + number of new inmates per year.
(iii) If the ALOS is specified as less than one year, and intake dental examinations are routinely performed upon entry, then -- Number of internees = average number of inmates + 1/3 x (1 + 2 x ALOS) x number of new inmates per year where ALOS = average length-of-stay (in fraction of year). (The number of FTE dentists is computed as in part I, section B, paragraph 3 above.)

B. Public or Non-Profit Private Dental Facilities.

1. Criteria. Public or nonprofit private facilties providing general dental care services will be designated as having a shortage of dental professional(s) if both of the following criteria are met:

(a) The facility is providing general dental care services to an area or population group designated as having a dental professional(s) shortage; and
(b) The facility has insufficent capacity to meet the dental care needs of that area or population group.

2. Methodology. In determining whether public or nonprofit private facilities meet the criteria established by paragraph B.1. of this part, the following methodology will be used:

(a) Provision of Services to a Designated Area or Population Group.

A facility will be considered to be providing services to an area or population group if either:

(i) A majority of the facility's dental care services are being provided to residents of designated dental professional(s) shortage areas or to population groups designated as having a shortage of dental professional(s); or

(ii) The population within a designated dental shortage area or population group has reasonable access to dental services provided at the facility. Reasonable access will be assumed if the population lies within 40 minutes travel time of the facility and non-physical barriers (relating to demographic and socioeconomic characteristics of the population) do not prevent the population from receiving care at the facility.

Migrant health centers (as defined in section 319(a)(1) of the Act) which are located in areas with designated migrant population groups and Indian Health Service facilities are assumed to be meeting this requirement.

(b) Insufficient Capacity To Meet Dental Care Needs.

A facility will be considered to have insufficient capacity to meet the dental care needs of a designated area or population group if either of the following conditions exists at the facility.

(i) There are more than 5,000 outpatient visits per year per FTE dentist on the staff of the facility. (Here the number of FTE dentists is computed as in part I, section B, paragraph 3 above.)

(ii) Waiting time for appointments is more than 6 weeks for routine dental services.

Mental Health Designation Criteria

Part I -- Geographic Areas

A. *Criteria*. A geographic area will be designated as having a shortage of mental health professionals if the following four criteria are met:

1. The area is a rational area for the delivery of mental health services.
2. One of the following conditions prevails within the area:
   (a) The area has --
      (i) A population-to-core-mental-health-professional ratio greater than or equal to 6,000:1 and a population-to-psychiatrist ratio greater than or equal to 20,000:1, or
      (ii) A population-to-core-professional ratio greater than or equal to 9,000:1, or
      (iii) A population-to-psychiatrist ratio greater than or equal to 30,000:1;
   (b) The area has unusually high needs for mental health services, and has --
      (i) A population-to-core-mental-health-professional ratio greater than or equal to 4,500:1 and a population-to-psychiatrist ratio greater than or equal to 15,000:1, or
      (ii) A population-to-core-professional ratio greater than or equal to 6,000:1, or
      (iii) A population-to-psychiatrist ratio greater than or equal to 20,000:1;
3. Mental health professionals in contiguous areas are overutilized, excessively distant or inaccessible to residents of the area under consideration.

B. *Methodology*. In determining whether an area meets the criteria established by paragraph A of this part, the following methodology will be used:

1. Rational Areas for the Delivery of Mental Health Services.
   (a) The following areas will be considered rational areas for the delivery of mental health services:

(i) An established mental health catchment area, as designated in the State Mental Health Plan under the general criteria set forth in section 238 of the Community Mental Health Centers Act.

(ii) A portion of an established mental health catchment area whose population, because of topography, market and/or transportation patterns or other factors, has limited access to mental health resources in the rest of the catchment area, as measured generally by a travel time of greater than 40 minutes to these resources.

(iii) A county or metropolitan area which contains more than one mental health catchment area, where data are unavailable by individual catchment area.

(b) The following distances will be used as guidelines in determining distances corresponding to 40 minutes travel time:

(i) Under normal conditions with primary roads available: 25 miles.

(ii) In mountainous terrain or in areas with only secondary roads available: 20 miles.

(iii) In flat terrain or in areas connected by interstate highways: 30 miles. Within inner portions of metropolitan areas, information on the public transportation system will be used to determine the distance corresponding to 40 minutes travel time.

2. Population Count. The population count used will be the total permanent resident civilian population of the area, excluding inmates of institutions.

3. Counting of mental health professionals.

(a) All non-Federal core mental health professionals (as defined below) providing mental health patient care (direct or other, including consultation and supervision) in ambulatory or other short-term care settings to residents of the area will be counted. Data on each type of core professional should be presented separately, in terms of the number of full-time-equivalent (FTE) practitioners of each type represented.

(b) Definitions:

(i) Core mental health professionals or core professionals includes those psychiatrists, clinical psychologists, clinical social workers, psychiatric nurse specialists, and marriage and family therapists who meet the definitions below.

(ii) Psychiatrist means a doctor of medicine (M.D.) or doctor of osteopathy (D.O.) who (A) Is certified as a psychiatrist or child psychiatrist by the American Medical Specialities Board of Psychiatry and Neurology or by the American Osteopathic Board of Neurology and Psychiatry, or, if not certified, is "board-eligible" (i.e., has successfully completed an accredited program of graduate medical or osteopathic education in psychiatry or child psychiatry); and (B) Practices patient care psychiatry or child psychiatry, and is licensed to do so, if required by the State of practice.

(iii) Clinical psychologist means an individual (normally with a doctorate in psychology) who is practicing as a clinical or counseling psychologist and is licensed or certified to do so by the State of practice; or, if licensure or certification is not required in the State of practice, an individual with a doctorate in psychology and two years of supervised clinical or counseling experience. (School psychologists are not included.)

(iv) Clinical social worker means an individual who (A) Is certified as a clinical social worker by the American Board of Examiners in Clinical Social Work, or is listed on the National Association of Social Workers' Clinical Register, or has a master's degree in social work and two years of supervised clinical experience; and (B) Is licensed to practice as a social worker, if required by the State of practice.

(v) Psychiatric nurse specialist means a registered nurse (R.N.) who (A) Is certified by the American Nurses Association as a psychiatric and mental health clinical nurse specialist, or has a master's degree in nursing with a specialization in psychiatric/mental health and two years of supervised clinical experience; and

(B) Is licensed to practice as a psychiatric or mental health nurse specialist, if required by the State of practice.

(vi) Marriage and family therapist means an individual (normally with a master's or doctoral degree in marital and family therapy and at least two years of supervised clinical experience) who is practicing as a marital and family therapist and is licensed or certified to do so by the State of practice; or, if licensure or certification is not required by the State of practice, is eligible for clinical membership in the American Association for Marriage and Family Therapy.

(c) Practitioners who provide patient care to the population of an area only on a part-time basis (whether because they maintain another office elsewhere, spend some of their time providing services in a facility, are semi-retired, or operate a reduced practice for other reasons), will be counted on a partial basis through the use of full-time-equivalency calculations based on a 40-hour week. Every 4 hours (or 1/2 day) spent providing patient care services in ambulatory or inpatient settings will be counted as 0.1 FTE, and each practitioner providing patient care for 40 or more hours per week as 1.0 FTE. Hours spent on research, teaching, vocational or educational counseling, and social services unrelated to mental health will be excluded; if a practitioner is located wholly or partially outside the service area, only those services actually provided within the area are to be counted.

(d) In some cases, practitioners located within an area may not be accessible to the general population of the area under consideration. Practitioners working in restricted facilities will be included on an FTE basis based on time spent outside the facility. Examples of restricted facilities include correctional institutions, youth detention facilities, residential treatment centers for emotionally disturbed or mentally retarded children, school systems, and inpatient units of State or county mental hospitals.

(e) In cases where there are mental health facilities or institutions providing both inpatient and outpatient services, only those FTEs providing mental health services in outpatient units or other short-term care units will be counted.

(f) Adjustments for the following factors will also be made in computing the number of FTE providers:

(i) Practitioners in residency programs will be counted as 0.5 FTE.

(ii) Graduates of foreign schools who are not citizens or lawful permanent residents of the United States will be excluded from counts.

(iii) Those graduates of foreign schools who are citizens or lawful permanent residents of the United States, and practice in certain settings, but do not have unrestricted licenses to practice, will be counted on a full-time-equivalency basis up to a maximum of 0.5 FTE.

(g) Practitioners suspended for a period of 18 months or more under provisions of the Medicare-Medicaid Anti-Fraud and Abuse Act will not be counted.

4. Determination of unusually high needs for mental health services. An area will be considered to have unusually high needs for mental health services if one of the following criteria is met:

(a) 20 percent of the population (or of all households) in the area have incomes below the poverty level.

(b) The youth ratio, defined as the ratio of the number of children under 18 to the number of adults of ages 18 to 64, exceeds 0.6.

(c) The elderly ratio, defined as the ratio of the number of persons aged 65 and over to the number of adults of ages 18 to 64, exceeds 0.25.

(d) A high prevalence of alcoholism in the population, as indicated by prevalence data showing the area's alcoholism rates to be in the worst quartile of the nation, region, or State.

(e) A high degree of substance abuse in the area, as indicated by prevalence data showing the area's substance abuse to be in the worst quartile of the nation, region, or State.

5. Contiguous area considerations. Mental health professionals in areas contiguous to an area being considered for designation will be considered excessively distant, overutilized or

inaccessible to the population of the area under consideration if one of the following conditions prevails in each contiguous area:

(a) Core mental health professionals in the contiguous area are more than 40 minutes travel time from the closest population center of the area being considered for designation (measured in accordance with paragraph B.1(b) of this part).

(b) The population-to-core-mental-health-professional ratio in the contiguous area is in excess of 3,000:1 and the population-to-psychiatrist ratio there is in excess of 10,000:1, indicating that core mental health professionals in the contiguous areas are overutilized and cannot be expected to help alleviate the shortage situation in the area for which designation is being considered. (If data on core mental health professionals other than psychiatrists are not available for the contiguous area, a population-to-psychiatrist ratio there in excess of 20,000:1 may be used to demonstrate overutilization.)

(c) Mental health professionals in contiguous areas are inaccessible to the population of the requested area due to geographic, cultural, language or other barriers or because of residency restrictions of programs or facilities providing such professionals.

Part II -- Population Groups

A. Criteria. Population groups within particular rational mental health service areas will be designated as having a mental health professional shortage if the following criteria are met:

1. Access barriers prevent the population group from using those core mental health professionals which are present in the area; and

2. One of the following conditions prevails:

(a) The ratio of the number of persons in the population group to the number of FTE core mental health professionals serving the population group is greater than or equal to 4,500:1 and the ratio of the number of persons in the population group to the number of FTE psychiatrists serving the population group is greater than or equal to 15,000:1; or,

(b) The ratio of the number of persons in the population group to the number of FTE core mental health professionals serving the population group is greater than or equal to 6,000:1; or,

(c) The ratio of the number of persons in the population group to the number of FTE psychiatrists serving the population group is greater than or equal to 20,000:1.

Part III – Facilities

A. Federal and State Correctional Institutions

1. Criteria. Medium to maximum security Federal and State correctional institutions for adults or youth, and youth detention facilities, will be designated as having a shortage of psychiatric professional(s) if both of the following criteria are met:

(a) The institution has more than 250 inmates, and

(b) The ratio of the number of internees per year to the number of FTE psychiatrists serving the institution is at least 2,000:1.

Here the number of internees is defined as follows:

(i) If the number of new inmates per year and the average length-of-stay (ALOS) are not specified, or if the information provided does not indicate that intake psychiatric examinations are routinely performed upon entry, then -- Number of internees = average number of inmates.

(ii) If the ALOS is specified as one year or more, and intake psychiatric examinations are routinely performed upon entry, then -- Number of internees = average number of inmates + number of new inmates per year.

(iii) If the ALOS is specified as less than one year, and intake psychiatric examinations are routinely performed upon entry, then -- Number of internees = average number of inmates + 1/3 x (1 + (2 x ALOS)) x number of new inmates per year where ALOS = average length-of-stay (in fraction of year). (The number of FTE psychiatrists is computed as in Part I, Section B, paragraph 3 above.)

B. State and County Mental Hospitals.

1. Criteria. A State or county hospital will be designated as having a shortage of psychiatric professional(s) if both of the following criteria are met:

(a) The mental hospital has an average daily inpatient census of at least 100; and

(b) The number of workload units per FTE psychiatrists available at the hospital exceeds 300, where workload units are calculated using the following formula:

Total workload units = average daily inpatient census + 2 x (number of inpatient admissions per year) + 0.5 x (number of admissions to day care and outpatient services per year).

C. Community Mental Health Centers and Other Public or Nonprofit Private Facilities.

1. Criteria. A community mental health center (CMHC), authorized by Pub. L. 94 - 63, or other public or nonprofit private facility providing mental health services to an area or population group, may be designated as having a shortage of psychiatric professional(s) if the facility is providing (or is responsible for providing) mental health services to an area or population group designated as having a mental health professional(s), and the facility has insufficient capacity to meet the psychiatric needs of the area or population group.

2. Methodology. In determining whether CMHCs or other public or nonprofit private facilities meet the criteria established in paragraph C.1 of this Part, the following methodology will be used.

(a) Provision of Services to a Designated Area or Population Group.

The facility will be considered to be providing services to a designated area or population group if either:

(i) A majority of the facility's mental health services are being provided to residents of designated mental health professional(s) shortage areas or to population groups designated as having a shortage of mental health professional(s); or

(ii) The population within a designated psychiatric shortage area or population group has reasonable access to mental health services provided at the facility. Such reasonable access will be assumed if the population lies within 40 minutes travel time of the facility and nonphysical barriers (relating to demographic and socioeconomic characteristics of the population) do not prevent the population from receiving care at the facility.

(b) Responsibility for Provision of Services.

This condition will be considered to be met if the facility, by Federal or State statute, administrative action, or contractual agreement, has been given responsibility for providing and/or coordinating mental health services for the area or population group, consistent with applicable State plans.

(c) Insufficient capacity to meet mental health service needs. A facility will be considered to have insufficient capacity to meet the mental health service needs of the area or population it serves if:

(i) There are more than 1,000 patient visits per year per FTE core mental health professional on staff of the facility, or

(ii) There are more than 3,000 patient visits per year per FTE psychiatrist on staff of the facility, or

(iii) No psychiatrists are on the staff and this facility is the only facility providing (or responsible for providing) mental health services to the designated area or population.

Appendix C

ICD-9 Codes Used for Ambulatory Care Sensitive Conditions (ACSCs)

ACSCs	ICD-9 Codes
Angina	411.1, 411.8, 413
Gastroenteritis	558.9
Severe ear nose and throat (ENT) infections	382, 462, 463, 465, 472.1
Bacterial pneumonia	481, 482.2, 482.3, 482.9, 483, 485, 486
Congestive heart failure	428, 402.01, 402.11, 402.91, 518.4
Kidney urinary tract infections	590, 599.0, 599.9
Hypertension	401.0, 401.9, 402.00, 402.10, 402.90
Chronic obstructive pulmonary disease	491, 492, 494, 496, 466.0
Cellulitis/Skin Grafts with cellulitis	681, 682, 683, 686, 263, 264
Dental conditions	521, 522, 523, 525, 528
Diabetes A: Diabetes mellitus with ketoacidosis	250.1, 250.2, 250.3
Diabetes B: Diabetes with other specified manifestations	250.8, 250.9
Diabetes C: Diabetes mellitus without complications or manifestations	250
Dehydration-volume depletion	276.5
Asthma	493
Hypoglycemia	251.2
Grand mal status and other epileptic convulsions	345
Immunization-related & preventable conditions	033, 037, 045, 320.0, 390, 391
Congenital syphilis	090

Source: Institute of Medicine, 1993.

Appendix D. List of Affiliations for State-Level Stakeholder Interviews

Department of Health

- Administration, including financial and operational administrators
- Aging Division
- Community and Rural Health Division
- Developmental Disability Division
- Mental Health Division
- Office of Pharmacy Services
- Office of Rural Health
- Preventive Health and Safety Division
- State Medicaid Office
- Substance Abuse Division

Governor's Office

Wyoming Business Council

Wyoming Economic Development Association

Wyoming Hospital Association

Wyoming Medical Society

Wyoming Primary Care Association

Appendix E. Stakeholder Interview Instrument

Stakeholder Interviews
12/5/06

Context: I'm here regarding rural health care delivery in Wyoming and to learn, from your perspective, about the current system and potential for redesign of that system.

Standard introductory questions:

1. In your opinion, what is exciting about the potential for redesign?
2. What issues do you think will be the greatest challenge to redesign?

    Probes:
    A. What is the current situation for this office/department/organization as you see it?
    B. What are your concerns?
    C. What is the role of this office/department/organization at the local level?
    D. What would you do to improve things if you were given unlimited resources?
    E. If you had the necessary resources but had to adjust your scope to a regional delivery system, how would you redesign this office/department/organization?

3. Who are the leaders in Wyoming that determine what changes are acceptable and can facilitate change?
    Probes:
    A. How do leaders from different policy sectors interact (legislative, education, health, economic development, housing, etc.)?
    B. What is the source of current and future state-wide leaders?

4. As you see it, what are the health care service gaps around the state? What areas have a shortage of specific services? How are shortages dealt with?

5. What formal or informal alliances exist among providers in Wyoming? (Ex: Hospital networks, referral networks, association networks, provider networks)
    Probe:
    A. Do any alliances promote coordination of care across the continuum?
    B. Are there any payer-initiated programs for care coordination (ex: disease management)?

5. What do you think the long-term commitment toward sustaining health system changes will be
    (a) From the state?
    (b) From the private or corporate side? (probe for distinct corporate territories in the state and various corporate-community ties)
    Probe for private institutions that help foster community development.

6. Are you aware of any efforts within the state aimed at implementing electronic health records?

<u>Probes for specific participants:</u>

Health care education
What is/are the current program(s)?

How is it going? What aspects are doing the best?

How are you bringing students in to the field? What is the graduation rate?

How do you track where graduates end up?

Is there interdisciplinary training?

Is there training in EMS? Telehealth?

Department of Health
Could you do your job under a different system? A regional system?

What about staffing?

Medicaid
What are the current needs in Wyoming from the Medicaid standpoint?

How could Medicaid best be set up to function in a regional delivery system?

State Pharmacy Office
Medicare Part D questions; similar to Oregon interview

Economic development
How involved are larger employers with their local communities? Specifically the health care delivery system?

Would corporations in Wyoming be willing to help finance local health care?

Would they help finance a regional delivery system if it streamlines the continuum of care?

State government
Considering that people are accustomed to traveling to surrounding states for their care, are there challenges to changing practice/payment/licensing issues in order to foster cross-border agreements?

Does government expect corporations in Wyoming to help finance health care? If so, are those expectations enforced in any manner?

What do you think the rural health delivery system should look like?

How committed are policy makers to the long-term funding of the redesign and continuing support of a redesigned state health care system.

Behavioral health
Who are the leaders in statewide mental health efforts?

What challenges do you believe mental health in Wyoming faces?

What are your concerns? (probe for data, technology)

Appendix F. Community Site Visit Instrument

1. COMMUNITY CONTEXT

1.1 (a) How do you define this community?

(b) In your opinion, has the community population grown or has the community grown physically in the last 5 years?
IF YES, please describe.

(c) Where do people in this community get their health care services?

1.2 In your opinion, what are the major resources and/or strengths of this community?

1.3 What are the major challenges it faces?
How does the community react to these challenges?

1.4 How do you think the community is doing in terms of:
… education/schools (also day care)
… access to health services (financially and physically)
… water and electricity resources
… sanitary services (waste and garbage disposal)
… communication services (telephone, TV, internet)
… roads and transportation
… irrigation systems (rural)
… commercial establishments (markets, shops, etc)
… community centers for meetings and gatherings (public library, church?)
… recreational facilities (parks, sports facilities, conventional centers, where people spend their free time)
… beautification or the aesthetic appeal of the community
… retention of seniors?
… attracting or retaining young residents?
… business recruitment
… police systems
… safety in community
… justice system/conflict resolution
… public services that provide rehabilitation, intervention, victim support or counseling

1.5 In your opinion, how sufficiently are the housing needs being met for
(a) seniors?
(b) the disabled?
(c) the low-income?
(d) new comers?

1.6 What do you perceive is the financial outlook of this community?

Do any local institutions, such as banks or other businesses, work to improve the financial outlook of the community?
Do community members know how they can get access to capital or credit?
Do you think people here generally trust one another in matters of interpersonal borrowing and lending?

1.7 Do you think this community welcomes diversity? (Why or why not?) (Diversity includes racial and ethnic diversity as well as differences in age and cultural preferences.)

1.8 Do you think that in this community people generally trust one another?

Probe: Do you think over the last few years this level of trust has gotten better, gotten worse, or stayed about the same?

2. COLLECTIVE ACTION AND SOLIDARITY

2.1 In the past three years, has the community organized to address a need or problem that affected the entire community? Can you describe one instance in detail?

2.2 Can you describe a failed attempt at organizing around an issue? Why do you think the attempt failed?

2.3 Are there organized discussions about the health care system in your community? If yes, who organizes the discussions and what are the usual topics?

2.4 How do members of the community react to changes in health care? (Changes might include policy changes, loss or gain of a facility, providers entering or exiting the community.)

3. LIST OF COMMUNITY INSTITUTIONS

3.1 What are the groups, organizations, or associations in this community? Which groups in this community play the most active role in helping improve the wellbeing of community members?

3.2 Which of these groups, organizations, or associations are least accessible to the community? Which are most accessible?

3.3. Are health care organizations involved in community discussions in any way?

4. INSTITUTIONAL NETWORKS AND ORGANIZATIONAL DENSITY

4.1 Which organizations work together? How do they work together (hierarchically, collaboratively)?

4.2 Are there any organizations that work against each other (compete or have some sort of conflicts)? Which ones and why?

4.3 Are there organizations that have the same or similar membership? Are there organizations that share resources?

5. COMMUNITY GOVERNANCE AND DECISIONMAKING

5.1 How are decisions made within this community? What is the role of the community leaders? How are community members involved?

5.2 Who are the main leaders in this community? (Probe formal and informal leadership.)

5.3 How do community members become leaders?

5.4 In your opinion, who are the health care leaders in this community? Why?

6. HEALTH CARE SYSTEM ASSESSMENT

6.1 a. What are this community's three principle health problems?
(Probe on problems unique to children, women, men, seniors, and underserved groups)
(Hint: The definition of health care system includes both services and providers; the full continuum of care.)

b. Have any actions been taken to address these issues?

6.2 a. What health care services and providers are available in this community?
i. hospital
ii. medical clinic
iii. nursing home
iv. home health
v. public health
vi. EMS
vii. mental health
viii. dentistry
ix. vision care
x. family planning
xi. other (specify)

b. Does the health clinic or hospital regularly have sufficient:
i. Physicians
ii. Nurses
iii. Other health staff
iv. Equipment/instruments
v. Ambulances
vi. Basic medicines
(If the answers are sufficient then probe for scenarios with increasing demand)

c. i. What are the outside relationships that support providers in this community?

ii. What are the outside relationships that support or share resources with health care services in this community?
(Probe: management agreements such as an outside entity supplying the CEO of the hospital, general administrative support network affiliations with organizations such as Catholic Health Initiatives or other health care systems, contractual arrangements for specific services)

d. What health care services do people leave the community? Why do you think this occurs?

6.3 a. How easy is it for community members to get the care they need when they need it? How long does it take to get in to see a doctor?

b. If someone is unable to pay, how do they obtain health care? How do the uninsured and the underinsured obtain health care?

c. Do people use the emergency room for non-emergent care, and why?

6.4 a. How often do people ask about quality information or make decisions based on quality information?

b. What do you/people think of the quality of care in this community?

c. What health care quality information is available to the community? Who provides quality information to the community and how is the quality information presented?

6.5 a. What are examples of health care providers collaborating and coordinating with other health care providers?

b. What are examples of health care providers collaborating and coordinating services with non-health care service providers?

c. How effective is the health care coordination in this community from your point of view?

6.6 a. How does the local health care system meet the needs of:
- i. seniors?
- ii. the uninsured and underinsured?
- iii. low-income residents?
- iv. the disabled?
- v. those with chronic illnesses?
- vi. people who speak a language other than English?

b. What areas of this community's health and health care need the most attention and improvement?

7. Is there anything else you can tell us about this community that we have not discussed?

Appendix G

Hospital Charge Per Day Ratio and Average Length of Stay Ratio (Colorado versus Wyoming) by Disease Specialty, 2003

Disease Specialty	Hospital Charge Per Day Ratio	Average Length of Stay Ratio
Neonatology	3.27	2.14
Oncology	2.40	2.31
Rheumatology	2.22	0.82
Otolaryngology	2.04	1.10
Dermatology	1.94	1.15
Ophthalmology	1.92	0.92
Endocrine	1.88	1.22
Nephrology	1.79	1.16
Cardiology	1.74	1.14
Hematology	1.74	1.29
Gastroenterology	1.73	1.16
Pulmonary	1.71	1.18
Dentistry	1.57	0.99
Neurology	1.53	1.62
General Surgery	1.52	1.28
Urology	1.51	1.26
Other	1.49	1.85
Thoracic Surgery	1.48	1.15
General Medicine	1.47	1.74
Gynecology	1.46	1.07
Vascular Surgery	1.43	1.40
Obstetrics	1.40	1.14
Neurosurgery	1.35	1.69
Orthopedics	1.31	1.18
Normal Newborns	1.24	1.06
Psychiatry	1.10	1.62

Source: Healthcare Cost and Utilization Project State Inpatient Sample, 2003; Wyoming hospital discharge data set from the Wyoming Hospital Association, 2003.

Appendix H

Hospital Charge Per Day Ratio and Average Length of Stay Ratio (Utah versus Wyoming) by Disease Specialty, 2003

Disease Specialty	Hospital Charge Per Day Ratio	Average Length of Stay Ratio
Neonatology	2.08	2.14
Oncology	1.60	2.05
Otolaryngology	1.24	1.05
Nephrology	1.19	1.23
Endocrine	1.18	1.14
General Medicine	1.17	1.72
Cardiology	1.16	1.14
Hematology	1.16	1.28
Dermatology	1.15	1.93
Ophthalmology	1.13	0.98
Gastroenterology	1.13	1.20
Pulmonary	1.12	1.28
Rheumatology	1.07	1.78
Dentistry	1.06	1.04
Neurology	1.05	1.49
Psychiatry	0.99	2.09
Thoracic Surgery	0.98	1.26
Urology	0.97	1.25
General Surgery	0.97	1.30
Other	0.95	1.64
Obstetrics	0.93	1.05
Neurosurgery	0.91	1.36
Vascular Surgery	0.90	1.32
Normal Newborns	0.90	1.08
Orthopedics	0.83	1.17
Gynecology	0.78	1.19

Source: Healthcare Cost and Utilization Project State Inpatient Sample, 2003; Wyoming hospital discharge data set from the Wyoming Hospital Association, 2003.

Appendix I

Hospital Charge Per Day Ratio and Average Length of Stay Ratio (Nebraska versus Wyoming) by Disease Specialty, 2003

Disease Specialty	Hospital Charge Per Day Ratio	Average Length of Stay Ratio
Neonatology	2.00	1.99
Oncology	1.87	1.99
Hematology	1.33	1.38
Cardiology	1.20	1.24
Gastroenterology	1.20	1.28
Thoracic Surgery	1.19	1.17
Otolaryngology	1.19	1.25
Other	1.18	1.91
Nephrology	1.18	1.32
Pulmonary	1.17	1.42
Ophthalmology	1.17	0.88
Urology	1.16	1.36
Endocrine	1.15	1.37
General Surgery	1.13	1.48
Neurosurgery	1.13	1.38
Rheumatology	1.11	1.18
Vascular Surgery	1.10	1.25
General Medicine	1.10	1.99
Dentistry	1.07	1.10
Dermatology	1.04	2.05
Neurology	1.02	1.66
Gynecology	1.01	1.22
Obstetrics	0.95	1.22
Psychiatry	0.93	1.78
Orthopedics	0.92	1.28
Normal Newborns	0.82	1.21

Source: Nebraska Hospital Association, 2003; Wyoming hospital discharge data set from the Wyoming Hospital Association, 2003.

Appendix J

Wyoming's Out-migrating Inpatients (to Colorado Hospitals) by ZIP Code of Wyoming Residence, Ranked based on Number of Discharges, 2003

ZIP Code	County	Number of Discharges	Percent
82001	Laramie	345	12.64
82009	Laramie	317	11.61
82070	Albany	226	8.28
82007	Laramie	171	6.26
82072	Albany	147	5.38
82240	Goshen	102	3.74
82601	Natrona	94	3.44
82501	Fremont	90	3.30
82301	Carbon	80	2.93
82201	Platte	79	2.89
82604	Natrona	78	2.86
82718	Campbell	73	2.67
82609	Natrona	69	2.53
82321	Carbon	57	2.09
82801	Sheridan	53	1.94
82716	Campbell	50	1.83
82633	Converse	48	1.76
82520	Fremont	44	1.61
82003	Laramie	39	1.43
82331	Carbon	28	1.03
82414	Park	23	0.84
82717	Campbell	23	0.84
82073	Albany	20	0.73
82327	Carbon	19	0.70
82082	Laramie	18	0.66
82514	Fremont	17	0.62
82214	Platte	15	0.55
82636	Natrona	15	0.55
82901	Sweetwater	14	0.51
82637	Converse	13	0.48
82323	Carbon	13	0.48
82435	Park	12	0.44
82935	Sweetwater	11	0.40
82225	Niobrara	11	0.40
82054	Laramie	11	0.40
82834	Johnson	11	0.40
82523	Fremont	11	0.40
82325	Carbon	11	0.40
82401	Washakie	10	0.37
82941	Sublette	10	0.37
82053	Laramie	10	0.37
82644	Natrona	9	0.33
82443	Hot Springs	9	0.33
82732	Campbell	8	0.29
82213	Platte	7	0.26
82212	Goshen	6	0.22
82510	Fremont	6	0.22
82515	Fremont	6	0.22
82721	Crook	6	0.22
82329	Carbon	6	0.22
82701	Weston	5	0.18
82930	Uinta	5	0.18
83001	Teton	5	0.18
82602	Natrona	5	0.18
82059	Laramie	5	0.18
82332	Carbon	5	0.18
83002	Teton	4	0.15
82005	Laramie	4	0.15
82060	Laramie	4	0.15
82639	Johnson	4	0.15
82223	Goshen	4	0.15
82324	Carbon	4	0.15
82334	Carbon	4	0.15
82426	Big Horn	4	0.15
82063	Albany	4	0.15
83113	Sublette	3	0.11
82635	Natrona	3	0.11
82002	Laramie	3	0.11
82244	Goshen	3	0.11
82516	Fremont	3	0.11
82649	Fremont	3	0.11
82727	Campbell	3	0.11
82410	Big Horn	3	0.11
82051	Albany	3	0.11
82083	Albany	3	0.11
82084	Albany	3	0.11
82715	Weston	2	0.07
82730	Weston	2	0.07
82939	Uinta	2	0.07
82336	Sweetwater	2	0.07
82902	Sweetwater	2	0.07
82839	Sheridan	2	0.07
82210	Platte	2	0.07
83110	Lincoln	2	0.07
82050	Laramie	2	0.07
82217	Goshen	2	0.07
82512	Fremont	2	0.07
82642	Fremont	2	0.07
82714	Crook	2	0.07
82431	Big Horn	2	0.07
82432	Big Horn	2	0.07
82052	Albany	2	0.07
82055	Albany	2	0.07
82071	Albany	2	0.07
82937	Uinta	1	0.04
83011	Teton	1	0.04
83014	Teton	1	0.04
82922	Sublette	1	0.04
82831	Sheridan	1	0.04
82832	Sheridan	1	0.04
82833	Sheridan	1	0.04
82842	Sheridan	1	0.04
82215	Platte	1	0.04
82433	Park	1	0.04
82605	Natrona	1	0.04
82630	Natrona	1	0.04
83116	Lincoln	1	0.04
82006	Laramie	1	0.04
82008	Laramie	1	0.04
82218	Goshen	1	0.04
82221	Goshen	1	0.04
82310	Fremont	1	0.04
82513	Fremont	1	0.04
82524	Fremont	1	0.04
82712	Crook	1	0.04
82720	Crook	1	0.04
82729	Crook	1	0.04
82411	Big Horn	1	0.04
82421	Big Horn	1	0.04
Unknown		19	0.73
Total*		**2601**	**95.27**

Source: Healthcare Cost and Utilization Project State Inpatient Sample, 2003.

*Due to rounding, percentage may not sum to 100%.

Appendix K

Wyoming's Out-migrating Inpatients (to Colorado Hospitals) by County of Wyoming Residence, Ranked based on Number of Discharges, 2003

County	Number of Discharges	Percent
Laramie	931	34.1
Albany	412	15.09
Natrona	275	10.07
Carbon	227	8.32
Fremont	187	6.85
Campbell	157	5.75
Goshen	119	4.36
Platte	104	3.81
Converse	61	2.23
Sheridan	59	2.16
Park	36	1.32
Sweetwater	29	1.06
Johnson	15	0.55
Sublette	14	0.51
Big Horn	13	0.48
Crook	11	0.4
Niobrara	11	0.4
Teton	11	0.4
Washakie	10	0.37
Hot Springs	9	0.33
Weston	9	0.33
Uinta	8	0.29
Lincoln	3	0.11
Unknown	19	0.7
Total*	**2730**	**99.99**

Source: Healthcare Cost and Utilization Project State Inpatient Sample, 2003.

*Due to rounding, percentage may not sum to 100%.

Appendix L

Hospital Charges Associated with Inpatient Out-migration From Wyoming to Colorado by Disease Specialty, Ranked Based on Adjusted Charges, 2003**

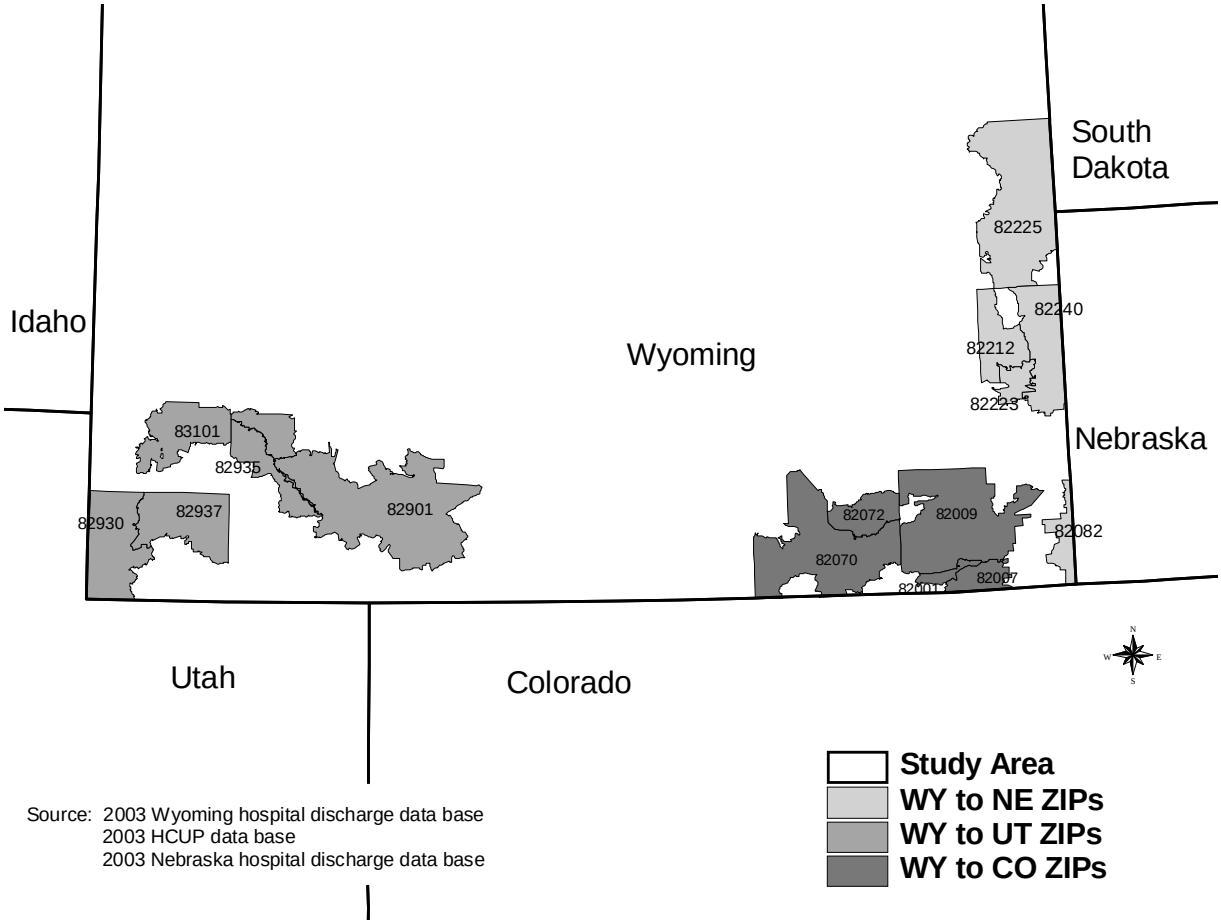
Disease Specialty	Unadjusted Charges*	Adjusted Charges
General Surgery	$18,837,958	$12,388,318
Orthopedics	$14,993,585	$11,423,394
Thoracic Surgery	$10,470,037	$7,089,618
Neonatology	$16,830,403	$5,148,755
Oncology	$9,745,123	$4,052,599
Neurosurgery	$5,030,127	$3,718,478
Vascular Surgery	$3,057,873	$2,139,599
Pulmonary	$3,428,847	$2,001,713
Urology	$2,914,656	$1,928,267
General Medicine	$2,594,209	$1,762,481
Cardiology	$3,020,377	$1,731,911
Obstetrics	$2,421,960	$1,726,128
Other	$2,355,565	$1,586,071
Neurology	$1,940,120	$1,264,613
Gastroenterology	$2,166,167	$1,252,970
Gynecology	$1,229,004	$843,436
Psychiatry	$741,665	$672,831
Nephrology	$925,583	$517,777
Otolaryngology	$975,608	$477,629
Hematology	$624,225	$358,258
Endocrine	$286,313	$152,487
Normal Newborns	$107,340	$86,736
Rheumatology	$72,415	$32,587
Dermatology	$55,580	$28,609
Ophthalmology	$23,460	$12,212
Unknown***	$4,934,470	$2,898,498
Total	**$109,782,670**	**$65,295,974**

Source: Source: Healthcare Cost and Utilization Project State Inpatient Sample, 2003; Wyoming hospital discharge data set from the Wyoming Hospital Association, 2003.

*Unadjusted charge figures come from the Colorado hospital discharge data.
**Adjusted charge figures were simulated charge estimates that may have been incurred if the out-migrating patients had received care within Wyoming hospitals.
***Adjusted charge for unknown was calculated based on average charge per day ratio of all disease specialties.

Appendix M

Wyoming ZIP Codes With the Most Out-migrating Hospital Discharges to Colorado, Utah, and Nebraska, 2003



Source: 2003 Wyoming hospital discharge data base
2003 HCUP data base
2003 Nebraska hospital discharge data base

Appendix N

Wyoming's Out-migrating Inpatients (to Utah Hospitals) by ZIP Code of Wyoming Residence, Ranked based on Number of Discharges, 2003

ZIP Code	County	Number of Discharges	Percent
82901	Sweetwater	568	18.81
82930	Uinta	456	15.10
82935	Sweetwater	382	12.65
82937	Uinta	133	4.41
83101	Lincoln	123	4.07
83110	Lincoln	108	3.58
82939	Uinta	87	2.88
83001	Teton	78	2.58
82501	Fremont	71	2.35
82902	Sweetwater	70	2.32
83002	Teton	54	1.79
82520	Fremont	50	1.66
83113	Sublette	48	1.59
82931	Uinta	43	1.42
82941	Sublette	39	1.29
83127	Lincoln	38	1.26
82933	Uinta	37	1.23
83116	Lincoln	37	1.23
83014	Teton	29	0.96
82801	Sheridan	26	0.86
82604	Natrona	25	0.83
83114	Lincoln	21	0.70
82301	Carbon	20	0.66
82601	Natrona	18	0.60
82514	Fremont	18	0.60
83128	Lincoln	17	0.56
82009	Laramie	17	0.56
82001	Laramie	16	0.53
82401	Washakie	14	0.46
82944	Uinta	12	0.40
82414	Park	12	0.40
83123	Lincoln	12	0.40
82718	Campbell	12	0.40
82435	Park	11	0.36
82609	Natrona	11	0.36
83111	Lincoln	11	0.36
82716	Campbell	11	0.36
82932	Sweetwater	10	0.33
82637	Converse	10	0.33
82943	Sweetwater	9	0.30
82945	Sweetwater	9	0.30
83120	Lincoln	9	0.30
83126	Lincoln	9	0.30
82007	Laramie	8	0.26
82834	Johnson	8	0.26
82443	Hot Springs	8	0.26
82925	Sublette	7	0.23
83121	Lincoln	7	0.23
82513	Fremont	7	0.23
82633	Converse	7	0.23
82070	Albany	6	0.20
82936	Uinta	5	0.17
83025	Teton	5	0.17
82938	Sweetwater	5	0.17
83115	Sublette	5	0.17
82201	Platte	5	0.17
82644	Natrona	5	0.17
83124	Lincoln	5	0.17
82240	Goshen	5	0.17
82510	Fremont	5	0.17
82602	Natrona	4	0.13
83112	Lincoln	4	0.13
83119	Lincoln	4	0.13
83122	Lincoln	4	0.13
82649	Fremont	4	0.13
82717	Campbell	4	0.13
82410	Big Horn	4	0.13
82411	Big Horn	4	0.13
82426	Big Horn	4	0.13
82431	Big Horn	4	0.13
83012	Teton	3	0.10
83414	Teton	3	0.10
82929	Sweetwater	3	0.10
82923	Sublette	3	0.10
82836	Sheridan	3	0.10
82327	Carbon	3	0.10
82336	Sweetwater	2	0.07
82942	Sweetwater	2	0.07
82922	Sublette	2	0.07
82839	Sheridan	2	0.07
82636	Natrona	2	0.07
83118	Lincoln	2	0.07
82523	Fremont	2	0.07
82321	Carbon	2	0.07
82323	Carbon	2	0.07
82732	Campbell	2	0.07
82420	Big Horn	2	0.07
82432	Big Horn	2	0.07
82701	Weston	1	0.03
83011	Teton	1	0.03
82934	Sweetwater	1	0.03
82190	Park	1	0.03
82433	Park	1	0.03
82648	Natrona	1	0.03
82003	Laramie	1	0.03
82221	Goshen	1	0.03
82223	Goshen	1	0.03
82310	Fremont	1	0.03
82515	Fremont	1	0.03
82524	Fremont	1	0.03
82712	Crook	1	0.03
82721	Crook	1	0.03
82729	Crook	1	0.03
82329	Carbon	1	0.03
82331	Carbon	1	0.03
82727	Campbell	1	0.03
82072	Albany	1	0.03
Unknown		24	0.77
Total*		**2869**	**95.02**

Source: Healthcare Cost and Utilization Project State Inpatient Sample, 2003.

*Due to rounding, percentage may not sum to 100%.

Appendix O

Wyoming's Out-migrating Inpatients (to Utah Hospitals) by County of Wyoming Residence, Ranked based on Number of Discharges, 2003

County	Number of Discharges	Percent
Sweetwater	1061	35.14
Uinta	773	25.6
Lincoln	411	13.61
Teton	173	5.73
Fremont	160	5.3
Sublette	104	3.44
Natrona	66	2.19
Laramie	42	1.39
Sheridan	31	1.03
Campbell	30	0.99
Carbon	29	0.96
Park	25	0.83
Big Horn	20	0.66
Converse	17	0.56
Washakie	14	0.46
Hot Springs	8	0.26
Johnson	8	0.26
Albany	7	0.23
Goshen	7	0.23
Platte	5	0.17
Crook	3	0.1
Weston	1	0.03
Unknown	24	0.79
Total*	**3019**	**99.96**

Source: Healthcare Cost and Utilization Project State Inpatient Sample, 2003.

*Due to rounding, percentage may not sum to 100%.

Appendix P

Wyoming's Out-migrating Inpatients (to Nebraska Hospitals) by ZIP Code of Wyoming Residence, Ranked based on Number of Discharges, 2003

ZIP Code	County	Number of Discharges	Percent
82240	Goshen	165	48.96
82223	Goshen	23	6.82
82082	Laramie	17	5.04
82212	Goshen	16	4.75
82225	Niobrara	15	4.45
82243	Goshen	11	3.26
82001	Laramie	10	2.97
82221	Goshen	9	2.67
82217	Goshen	8	2.37
82003	Laramie	6	1.78
82050	Laramie	6	1.78
82244	Goshen	5	1.48
82604	Natrona	4	1.19
82201	Platte	3	0.89
82214	Platte	3	0.89
82218	Goshen	3	0.89
82219	Goshen	3	0.89
82901	Sweetwater	3	0.89
82007	Laramie	2	0.59
82009	Laramie	2	0.59
82060	Laramie	1	0.30
82072	Albany	1	0.30
82211	Wyoming	1	0.30
82222	Niobrara	1	0.30
82321	Carbon	1	0.30
82401	Washakie	1	0.30
82414	Park	1	0.30
82501	Fremont	1	0.30
82520	Fremont	1	0.30
82633	Converse	1	0.30
82636	Natrona	1	0.30
82644	Natrona	1	0.30
82701	Weston	1	0.30
82716	Campbell	1	0.30
82720	Crook	1	0.30
82732	Campbell	1	0.30
82801	Sheridan	1	0.30
82930	Uinta	1	0.30
82935	Sweetwater	1	0.30
82941	Sublette	1	0.30
82945	Sweetwater	1	0.30
83001	Teton	1	0.30
83123	Lincoln	1	0.30
Total*		**337**	**100.05**

Source: Nebraska Hospital Association, 2003.

*Due to rounding, percentage may not sum to 100%.

Appendix Q

Wyoming's Out-migrating Inpatients (to Nebraska Hospitals) by County of Wyoming Residence, Ranked based on Number of Discharges, 2003

County	Number of Discharges	Percent
Goshen	243	72.11
Laramie	44	13.06
Niobrara	16	4.75
Natrona	6	1.78
Platte	6	1.78
Sweetwater	5	1.48
Campbell	2	0.59
Fremont	2	0.59
Albany	1	0.3
Carbon	1	0.3
Converse	1	0.3
Crook	1	0.3
Lincoln	1	0.3
Park	1	0.3
Sheridan	1	0.3
Sublette	1	0.3
Teton	1	0.3
Uinta	1	0.3
Washakie	1	0.3
Weston	1	0.3
Unknown	1	0.3
Total*	**337**	**100.04**

Source: Nebraska Hospital Association, 2003.

*Due to rounding, percentage may not sum to 100%.

Appendix R

Hospital Charges Associated with Inpatient In-migration From Colorado to Wyoming by Disease Specialty, Ranked Based on Charge Amount, 2003

Disease Specialty	Charges
Orthopedics	$977,029
General Surgery	$969,085
Pulmonary	$441,023
Cardiology	$375,248
Oncology	$258,645
Vascular Surgery	$224,828
Psychiatry	$199,499
Neurology	$179,868
Gastroenterology	$129,950
Urology	$124,806
Endocrine	$97,105
Other	$94,242
Thoracic Surgery	$92,872
General Medicine	$88,447
Obstetrics	$72,683
Nephrology	$63,414
Otolaryngology	$58,734
Neurosurgery	$35,764
Gynecology	$32,472
Normal Newborns	$13,265
Neonatology	$7,261
Hematology	$4,972
Ophthalmology	$4,734
Dentistry	$0
Dermatology	$0
Rheumatology	$0
Unknown	$299,866
Total*	**$4,845,813**

Source: Wyoming Hospital Discharge Data Set from the Wyoming Hospital Association, 2003.

*Total number based on 336 numbers of hospital charges.

Appendix S

Hospital Charges Associated with Inpatient In-migration From Utah to Wyoming by Disease Specialty, Ranked Based on Charge Amount, 2003

Disease Specialty	Charges
General Surgery	$464,604
Orthopedics	$358,249
Pulmonary	$249,879
Cardiology	$169,882
Gastroenterology	$154,575
Neurosurgery	$121,932
Obstetrics	$66,485
Neurology	$51,516
General Medicine	$43,322
Urology	$37,392
Hematology	$30,642
Thoracic Surgery	$29,071
Gynecology	$28,322
Nephrology	$27,028
Endocrine	$23,188
Psychiatry	$19,862
Other	$15,064
Normal Newborns	$8,214
Neonatology	$7,821
Otolaryngology	$3,835
Oncology	$3,329
Dentistry	$0
Dermatology	$0
Ophthalmology	$0
Rheumatology	$0
Vascular Surgery	$0
Unknown	$70,310
Total*	**$1,984,521**

Source: Wyoming Hospital Discharge Data Set from the Wyoming Hospital Association, 2003.

*Total number based on 189 numbers of hospital charges.

Appendix T

Hospital Charges Associated with Inpatient In-migration From Nebraska to Wyoming by Disease Specialty, Ranked Based on Charge Amount, 2003

Disease Specialty	Charges
Thoracic Surgery	$1,239,423
Orthopedics	$1,002,796
Cardiology	$549,350
General Surgery	$366,196
Oncology	$246,834
Pulmonary	$245,297
General Medicine	$176,141
Urology	$165,207
Gastroenterology	$142,926
Vascular Surgery	$94,796
Gynecology	$89,980
Obstetrics	$79,364
Neurosurgery	$53,950
Neurology	$52,766
Endocrine	$45,977
Nephrology	$25,343
Otolaryngology	$22,818
Neonatology	$20,928
Psychiatry	$19,689
Normal Newborns	$7,552
Dentistry	$0
Dermatology	$0
Hematology	$0
Ophthalmology	$0
Rheumatology	$0
Other	$0
Unknown	$1,271,366
Total*	**$5,918,702**

Source: Wyoming Hospital Discharge Data Set from the Wyoming Hospital Association, 2003.

*Total number based on 277 numbers of hospital charges.

Appendix U

	Finance	Organization	Governance
Wyoming	**1.1 Personal Health Care Expenditures** 2004, Total PHCE (millions) = $2,270 Medicaid, PHCE (millions) = $371 Medicare, PHCE (millions) = $342 PHCE % by services: 39.1%, hospital care 23.2%, physician services 5.1%, dental services 11.6%, prescription drugs 1.1%, home health care 6.3%, nursing home care **1.2 State and Federal Financing** *FY 2004* Medicaid – state funds (millions) = $36 Medicaid – federal funds (millions) = $64 Medicaid as % of total = 4.6% *FY 2003* All gov't health spending (millions) = $709 Medicaid – state funds (millions) = $36 Medicaid – federal funds (millions) = $64 Medicaid as % of total = 4.6% *Total HRSA financial assistance* FY 2006 = $8,879,720 FY 2005 = $9,691,984 * ORHP, specific grants = $816,023 FY 2004 = $11,205,368 **1.3 Health Insurance Coverage** *2004-2005 Health Insurance Coverage* Total population, all ages Employer: 54% Individual: 7% Medicaid: 11% Medicare: 12% Other Public: 2% Uninsured: 14% Uninsured, Non-elderly (ages 0-64): 17%	**2.1 Healthcare Entities** (Numbers reflect Medicare-approved providers) Hospitals = 34 Certified Beds = 2,153 Critical Access Hospitals = 14 Federally Qualified Health Clinics = 7, Rural Health Clinics = 19 **2.2 Healthcare Workforce** *Providers per 100,000 population, 200*4 Primary Care Physicians = 72.06 Registered Nurses = 804 Licensed Practical Nurses = 181.63 Dentists = 52.5144 Dental Hygienists = 65.15 Physician Assistants = 26.06 Optometrists = 23.69 Pharmacists = 90.81 Pharmacy Technicians & Aids = 75.02 Emergency Medical Technicians & Paramedics = 73.05 *Primary Care,* Health Professional Shortage Area 33 total number HPSAs (12, single counties) 71.80 practitioners needed *Mental Health,* Health Professional Shortage Area 18 total number HPSAs (7, single counties) 18.60 practitioners needed *Dental Care,* Health Professional Shortage Area 18 total number HPSAs (1, single counties) 16.00 practitioners needed	**3.1 Governance & Structure** All activities and operations of the Department of Health fall under the main offices of the State Health Director, Deputy Director of Administration, Chief of Staff, Mental health and substance abuse services Deputy Director, and Chief financial officers. These offices report to the Director and State Health Officer. Responsibilities around emergency response and medical services fall under the State Health Director office. The Deputy Direction of Administration is responsible for the licensing of facilities and providers, the office of pharmacy, administering Medicaid and SCHIP, and operations of the state health facilities. Divisions for Aging, Community and Rural Health, Preventive Health and Safety, and Developmental Disabilities are overseen by the Chief of Staff. **Advisory Groups** • Wyoming Health Care Commission • Health Advisory Council (in progress of reorganizing) **3.2 Medicaid Regulations** Eligibility and enrollment process, July 2006 *Pregnant women* Income eligibility level: 133% FPL Presumptive eligibility: Yes *Children* Income eligibility level - Medicaid: 133% FPL (0-5 yrs), 100% FPL (6 -19 yrs), Income eligibility level – SCHIP(separate): 200% FPL Presumptive eligibility: No *Parents* Income threshold: $7,080 per year (nonworking), $9,480 per year (working) **3.3 Health Provider Licensing** *Dept of Administration and Information* <http://plboards.state.wy.us/>

Appendix

	Finance	Organization	Governance
Alaska	**1.1 Total Personal Health Care Expenditures** 2004, Total PHCE (millions) = $4,170 Medicaid, PHCE (millions) = $865 Medicare, PHCE (millions) = $325 PHCE % by services: 40.0%, hospital care 28.7%, physician services 5.7%, dental services 8.3%, prescription drugs 1.5%, home health care 1.7%, nursing home care **1.2 State and Federal Financing** *FY 2004* Medicaid – state funds (millions) = $313 Medicaid – federal funds (millions) = $669 Medicaid as % of total = 12.8% *FY 2003* All gov't health spending (millions)= $1,227 Medicaid – state funds (millions) = $270 Medicaid – federal funds (millions) = $574 Medicaid as % of total = 12.7% *Total HRSA financial assistance* FY 2006 = $39,528,397 FY 2005 = $41,670,059 * ORHP, specific grants = $1,413,590 FY 2004 = $41,502,622 **1.3 Health Insurance Coverage** *2004-2005 Health Insurance Coverage* Total population, all ages Employer: 52% Individual: 4% Medicaid: 16% Medicare: 6% Other Public: 5% Uninsured: 17% Uninsured, Non-elderly (ages 0-64): 19%	**2.1 Healthcare Entities** (Numbers reflect Medicare-approved providers) Hospitals = 30 Certified Beds = 2,105 Critical Access Hospitals = 11 Federally Qualified Health Clinics = 23 Rural Health Clinics = 4 **2.2 Healthcare Workforce** *Number of Providers per 100,000 population, 2004* Primary Care Physicians = 94.90 Registered Nurses = 1,031 Licensed Practical Nurses = 73.23 Dentists = 74.76 Dental Hygienists = 39.67 Physician Assistants = 42.41 Optometrists = 7.63 Pharmacists = 54.93 Pharmacy Technicians & Aids = 65.61 Emergency Medical Technicians & Paramedics = 32.04 *Primary Care,* Health Professional Shortage Area 73 total number HPSAs (13, single counties) 48.90 practitioners needed *Mental Health,* Health Professional Shortage Area 55 total number HPSAs (21, single counties) 2.90 practitioners needed *Dental Care,* Health Professional Shortage Area 47 total number HPSAs (14, single counties) 12.80 practitioners needed **2.3 Rural Health System and Networks** • Alaska Small Hospital Performance Improvement Network • Alaska Tribal Health System • Alaska Federal Health Care Access Network	**3.1 Governance & Structure** The Department of Health and Social Services was (reorganized in July 2003. The Deputy Commissioner, Deputy Commissioner of Children's Services, the Deputy Commissioner of Operations, and the Assistant Commissioner of Financial and Management Services report to the Department's Commissioners. Divisions/Offices under the Deputy Commissioner of Operation are as follows: • Division of AK Pioneer Homes • Division of Behavioral Health • Office of Children Services • Division of Health Care Services • Division of Juvenile Justice • Division of Public Assistance • Division of Public Health • Division of Senior and Disability Services **Advisory Groups** • ***Alaska Partnership for Healthy Communities*** • Governor's Advisory Board on Alcohol and Drug Abuse • Alaska Children's Trust • Alaska Commission on Aging • Alaska Mental Health Board • Governor's Council on Disabilities & Special Education **3.2 Medicaid Regulations** Eligibility and enrollment process, July 2006 *Pregnant women* Income eligibility level: 175% FPL Presumptive eligibility: No *Children* Income eligibility level: 175% FPL Presumptive eligibility: No *Parents* Income threshold: $15,732 per year (nonworking), $16,812 per year (working) **3.3 Health Provider Licensing** *Div. of Corporations, Business, & Professional Licensing; Dept. of Commerce, Community & Economic Development* <http://www.commerce.state.ak.us/occ/home.htm>

Appendix

	Finance	Organization	Governance
Nebraska	**1.1 Total Personal Health Care Expenditures** 2004, Total PHCE (millions) = $9,860 Medicaid, PHCE (millions) = $1,387 Medicare, PHCE (millions) = $1,733 PHCE % by services: 40.9%, hospital care 22.9%, physician services 4.2%, dental services 11.6%, prescription drugs 0.8%, home health care 8.8%, nursing home care **1.2 State and Federal Financing** *FY 2004* Medicaid – state funds (millions) = $482 Medicaid – federal funds (millions) = $895 Medicaid as % of total = 19.4% *FY 2003* All gov't health spending (millions)= $7,103 Medicaid – state funds (millions) = $466 Medicaid – federal funds (millions) = $823 Medicaid as % of total = 18.9% *Total HRSA financial assistance* FY 2006 = $23,105,489 FY 2005 = $28,732,814 * ORHP, specific grants = $2,270,322 FY 2004 = $30,352,375 **1.3 Health Insurance Coverage** *2004-2005 Health Insurance Coverage* Total population, all ages Employer: 59% Individual: 7% Medicaid: 10% Medicare: 12% Other Public: 1% Uninsured: 10% Uninsured, Non-elderly (ages 0-64): 13%	**2.1 Healthcare Entities** (Numbers reflect Medicare-approved providers) Hospitals = 98 Certified Beds = 7,036 Critical Access Hospitals = 65 Federally Qualified Health Clinics = 8 Rural Health Clinics = 120 **2.2 Healthcare Workforce** *Number of Providers per 100,000 population, 2004* Primary Care Physicians = 71.71 Registered Nurses = 1,061 Licensed Practical Nurses = 342.83 Dentists = 63.76 Dental Hygienists = 54.37 Physician Assistants = 31.59 Optometrists = 13.74 Pharmacists = 104.74 Pharmacy Technicians & Aids = 118.47 Emergency Medical Technicians & Paramedics = 26.90 *Primary Care,* Health Professional Shortage Area 70 total number HPSAs (23, single counties) 55.80 practitioners needed *Mental Health,* Health Professional Shortage Area 18 total number HPSAs (0, single counties) 35.00 practitioners needed *Dental Care,* Health Professional Shortage Area 30 total number HPSAs (4, single counties) 11.40 practitioners needed **2.3 Rural Health System and Networks** • Rural Comprehensive Care Network • South East Rural Physicians Alliance Network (SERPA) • Panhandle Partnership for Health and Human Services • High Plains Rural Health Network	**3.1 Governance & Structure** **Health and Human Service System –** LB296 was signed into bill Spring 2007. Under the bill, a central authority, Chief Executive Officer will over see the HHS department and report directly to the Governor. The CEO as wells as the directors for each of the six reorganized departments will be appointed by the Governor and confirmed by the Legislature. The six reorganized departments will be as follows: • Public Health • Medicaid and Long-Term Care • Children & Family Services • Behavioral Health • Developmental Disabilities • Veterans' Homes. **Advisory Groups** • State Board of Health • State Advisory Committee on Mental Health Services **3.2 Medicaid Regulations** Eligibility and enrollment process, July 2006 *Pregnant women* Income eligibility level: 185% FPL Presumptive eligibility: Yes *Children* Income eligibility level - Medicaid: 185% FPL Presumptive eligibility: No *Parents* Income threshold: $7,716 per year (nonworking), $9,645 per year (working) **3.3 Health Provider Licensing** *Dept. of Regulation & Licensure: Credentialing Division, Nebraska Health and Human Services* <http://www.hhs.state.ne.us/crl/crlindex.htm>

Appendix

	Finance	Organization	Governance
New Mexico	**1.1 Total Personal Health Care Expenditures** 2004, Total PHCE (millions) = $7,992 Medicaid, PHCE (millions) = $2,034 Medicare, PHCE (millions) = $1,330 PHCE % by services: 38.5%, hospital care 21.3%, physician services 5.1%, dental services 9.7%, prescription drugs 5.6%, home health care 4.6%, nursing home care **1.2 State and Federal Financing** *FY 2004* Medicaid – state funds (millions) = $452 Medicaid – federal funds (millions) = $1,886 Medicaid as % of total = 24.4% *FY 2003* All gov't health spending (millions)= $2,468 Medicaid – state funds (millions) = $453 Medicaid – federal funds (millions) = $1,595 Medicaid as % of total = 22.1% *Total HRSA financial assistance* FY 2006 = $57,681,552 FY 2005 = $70,476,524 * ORHP, specific grants = $1,604,470 FY 2004 = $1,604,470 **1.3 Health Insurance Coverage** *2004-2005 Health Insurance Coverage* Total population, all ages Employer: 44% Individual: 4% Medicaid: 17% Medicare: 13% Other Public: 2% Uninsured: 20% Uninsured, Non-elderly (ages 0-64): 24%	**2.1 Healthcare Entities** (Numbers reflect Medicare-approved providers) Hospitals = 68 Certified Beds = 6,411 Critical Access Hospitals = 6 Federally Qualified Health Clinics = 90 Rural Health Clinics = 13 **2.2 Healthcare Workforce** *Number of Providers per 100,000 population, 2004* Primary Care Physicians = 78.29 Registered Nurses = 711 Licensed Practical Nurses = 34.54 Dentists = 43.71 Dental Hygienists = 24.69 Physician Assistants = 20.91 Optometrists = 7.88 Pharmacists = 67.25 Pharmacy Technicians & Aids = 89.84 Emergency Medical Technicians & Paramedics = 48.34 *Primary Care,* Health Professional Shortage Area 88 total number HPSAs (18, single counties) 394.70 practitioners needed *Mental Health,* Health Professional Shortage Area 39 total number HPSAs (8, single counties) 45.20 practitioners needed *Dental Care,* Health Professional Shortage Area 58 total number HPSAs (14, single counties) 187.30 practitioners needed **2.3 Rural Health System and Networks** • New Mexico Primary Care Association Information Technology Network • Presbyterian Health care system • Navajo Area Indian Health Services	**3.1 Governance & Structure** **Department of Health** – All activities and operations of the Department fall under the main offices of the Chief Medical Officer, Deputy Secretary of Finance and Administration, Deputy Secretary of Program, and Deputy Secretary of Facilities. These offices report to the Cabinet Secretary. Specifically divisions and offices overseen by the Deputy Secretary of Programs follows: • Office of Policy & Multicultural Health, • Behavioral Health Services • Public Health Division • Division of Health Improvement • Developmental Disabilities Division **Advisory Groups** • **NM Health Policy Commission (**HPC) – an independent state agency administratively attached to the Dept. of Finance and Administration. The HPC is responsible for conducting analysis, providing technical assistance, and formulating recommendations to both the legislative and executive branches. **3.2 Medicaid Regulations** Eligibility and enrollment process, July 2006 *Pregnant women* Income eligibility level: 185% FPL Presumptive eligibility: Yes *Children* Income eligibility level: 235% FPL Presumptive eligibility: Yes *Parents* Income threshold: $4,668 per year (nonworking), $10,836 per year (working) *Waiver: Income threshold $32,000 per yr coverage fewer benefits and higher cost-sharing **3.3 Health Provider Licensing** *Regulation & Licensing Department* <http://www.rld.state.nm.us/index.html>

Appendix

	Finance	Organization	Governance
North Dakota	**1.1 Total Personal Health Care Expenditures** 2004, Total PHCE (millions) = $3,984 Medicaid, PHCE (millions) = $499 Medicare, PHCE (millions) = $691 PHCE % by services: 43.1%, hospital care 21.0%, physician services 4.7%, dental services 11.5%, prescription drugs 0.5%, home health care 9.9%, nursing home care **1.2 State and Federal Financing** *FY 2004* Medicaid – state funds (millions) = $136 Medicaid – federal funds (millions) = $356 Medicaid as % of total = 16.8% *FY 2003* All gov't health spending (millions)= $767 Medicaid – state funds (millions) = $111 Medicaid – federal funds (millions) = $336 Medicaid as % of total = 15.8% Total HRSA financial assistance FY 06 = $10,465,490 FY 05 = $15,585,095 * ORHP grants = $1,658,874 FY 04 = $18,045,694 **1.3 Health Insurance Coverage** *2004-2005 Health Insurance Coverage* Total population, all ages Employer: 56% Individual: 10% Medicaid: 8% Medicare: 14% Other Public: 2% Uninsured: 11% Uninsured, Non-elderly (ages 0-64): 13%	**2.1 Healthcare Entities** (Numbers reflect Medicare-approved providers) Hospitals = 52 Certified Beds = 3,645 Critical Access Hospitals = 31 Federally Qualified Health Clinics = 11 Rural Health Clinics = 65 **2.2 Healthcare Workforce** *Number of Providers per 100,000 population, 2004* Primary Care Physicians = 84.97 Registered Nurses = 1,180 Licensed Practical Nurses = 424.05 Dentists = 50.29 Dental Hygienists = 100.89 Physician Assistants = 34.37 Optometrists = 18.92 Pharmacists = 97.74 Pharmacy Technicians & Aids = 81.97 Emergency Medical Technicians & Paramedics = 63.06 *Primary Care,* Health Professional Shortage Area 74 total number HPSAs (28, single counties) 97.10 practitioners needed *Mental Health,* Health Professional Shortage Area 42 total number HPSAs (23, single counties) 16.90 practitioners needed *Dental Care,* Health Professional Shortage Area 25 total number HPSAs (12, single counties) 16.30 practitioners needed **2.3 Rural Health System and Networks** • Northland Healthcare Alliance • North Region Health Alliance • MeritCare Quality Improvement Network	**3.1 Governance & Structure** **Department of Health –** The Department is overseen by the State Health Officer & Deputy Officer. The five sections composing the department are as follows: • Administrative Support • Medical Services • Community Health • Health Resources • Environmental Health • Emergency Preparedness and Response **Advisory Groups** • **State Health Council** –serves as the North Dakota Department of Health's advisory body. The council's 11 members are appointed by the governor for three-year terms. Four members are appointed from the health-care provider community, five from the public sector, one from the energy industry and one from the manufacturing and processing industry. **3.2 Medicaid Regulations** Eligibility and enrollment process, July 2006 *Pregnant women* Income eligibility level: 133% FPL Presumptive eligibility: No *Children* Income eligibility level - Medicaid: 133% FPL (0-5 yrs), 100% FPL (6 -19 yrs), Income eligibility level – SCHIP: 140% FPL Presumptive eligibility: No *Parents* Income threshold: $6,276 per year (nonworking), $10,849 per year (working) **3.3 Health Provider Licensing** *Department of Health* <http://www.ag.ndsu.edu/ccv/ced/publications/ec752/reportlicensebyagency.htm> (listing)

Appendix

	Finance	Organization	Governance
Vermont	**1.1 Total Personal Health Care Expenditures** 2004, Total PHCE (millions) = $3,557 Medicaid, PHCE (millions) = $764 Medicare, PHCE (millions) = $511 PHCE % by services: 36.1%, hospital care 23.3%, physician services 5.4%, dental services 11.1%, prescription drugs 2.7%, home health care 6.7%, nursing home care **1.2 State and Federal Financing** *FY 2004* Medicaid – state funds (millions) = $251 Medicaid – federal funds (millions) = $439 Medicaid as % of total = 21.5% *FY 2003* All gov't health spending (millions)= $847 Medicaid – state funds (millions) = $243 Medicaid – federal funds (millions) = $410 Medicaid as % of total = 21.4% Total HRSA financial assistance FY 06 = $12,096,895 FY 05 = $13,473,450 * ORHP grants = $1,039,602 FY 04 = $14,113,459 **1.3 Health Insurance Coverage** *2004-2005 Health Insurance Coverage* Total population, all ages Employer: 52% Individual: 4% Medicaid: 19% Medicare: 13% Other Public: 1% Uninsured: 11% Uninsured, Non-elderly (ages 0-64): 13%	**2.1 Healthcare Entities** (Numbers reflect Medicare-approved providers) Hospitals = 16 Certified Beds = 1,982 Critical Access Hospitals = 8 Federally Qualified Health Clinics = 24 Rural Health Clinics = 17 **2.2 Healthcare Workforce** *Number of Providers per 100,000 population, 2004* Primary Care Physicians = 110.40 Registered Nurses = 1,037 Licensed Practical Nurses = 238.17 Dentists = 56.00 Dental Hygienists = 104.60 Physician Assistants = 27.52 Optometrists = 9.66 Pharmacists = 69.20 Pharmacy Technicians & Aids = 96.56 Emergency Medical Technicians & Paramedics = 56.32 *Primary Care,* Health Professional Shortage Area 24 total number HPSAs (0, single counties) 16.30 practitioners needed *Mental Health,* Health Professional Shortage Area 10 total number HPSAs (0, single counties) 7.10 practitioners needed *Dental Care,* Health Professional Shortage Area 12 total number HPSAs (1, single counties) 6.7 practitioners needed **2.3 Rural Health System and Networks** • Vermont Rural Health Alliance • Windsor Community Health Initiative	**3.1 Governance & Structure** **Department of Health** – The department is one of the four departments within the Agency of Human Services. Divisions/programs under the Department as follows: • Alcohol and Drug Abuse Programs • Board of Medical Practice • Division of Community Public Health • Division of Health Improvement • Division of Health Protection • Division of Health Surveillance • Mental Health Services **Advisory Groups** • **Mental Health Board** –each unit of Mental Health Services has supporting committees to advise and provide input. **3.2 Medicaid Regulations** Eligibility and enrollment process, July 2006 *Pregnant women* Income eligibility level: 200% FPL Presumptive eligibility: No *Children* Income eligibility level - Medicaid: 300% FPL Income eligibility level – SCHIP (separate: 300% FPL Presumptive eligibility: No *Parents* Income threshold: $30,710 per year (nonworking), $31,790 per year (working) **3.3 Health Provider Licensing** *Office of Professional Regulation, Vermont Secretary of State* < http://www.vtprofessionals.org/ >

Appendix

	Finance	Organization	Governance
New Zealand	Total 05/06 health spending = $9.7 billion Total 06/07 health spending = $10.64 billion (21% of the total government expenditures - $52.3 billion) In 2006/07, DHB appropriations = $7.41 billion (mostly allocated using population-based funding formula) Vote Health Expenditures 04/05 per capita = $2,122 ($ nominal), $2,064 ($ real) {5.8% of GDP} Components of 04/05 Vote Health Expenditures (total 8,013,321) 76.9%, personal health 17.9%, disability support services 1.8%, public health purchasing 1.0%, independent service providers 1.1%, other payments 1.2%, Ministry of Health Public sector funding is the major source of funding for health and disability support services, accounting for approximately 80% of all health expenditures, with out-of-pocket expenditures and private insurance being the other main contributors	21 District Health Boards 12 Public Health Units (providing over half of public health services) 81 Primary Health Organizations Primary Health Organizations are the local structures for delivering and coordinating primary health care services. PHOs vary widely in size and structure and are not-for-profit.	The ministry has eight directorates, through which its roles and responsibilities are filled. • Corporate and Information Direct. • Clinical Services Direct. • DHB Funding and Performance Direct. • Disability Services Direct. • Māori Health Direct. • Mental Health Direct. • Public Health Direct. • Sector Policy Direct. There are eight business units in the Ministry of Health, employing 43% of the total staff • New Zealand Health Information Service • Health Payments, Agreements and Compliance • National Screening Unit • New Zealand Medical Devices Safety Authority (Medsafe) • National Radiation Laboratory • Clinical Training Agency • Information Technology Shared Services • Public Health Intelligence

Appendix

	Population Demographics	Financial Indicators	
Wyoming	*U.S. Census Population Estimates* 2006: 515,004 2004: 505,534 2003: 501,490 2000: 493,782 (34.9% rural population)	*Gross State Product* 2004: $24,092 million 2003: $21,806 million	*Government Expenditures (capital inclusive)* 2004: $2,175 million 2003: $2,197 million
Alaska	*U.S. Census Population Estimates* 2006: 670,053 2004: 656,834 2003: 647,747 2000: 626,932 (34.4% rural population)	*Gross State Product* 2004: $35,988 million 2003: $34,488 million	*Government Expenditures (capital inclusive)* 2004: $7,650 million 2003: $6,659 million
Nebraska	*U.S. Census Population Estimates* 2006: 1,768,331 2004: 1,746,980 2003: 1,737,017 2000: 1,711,263 (30.2% rural population)	*Gross State Product* 2004: $67,989 million 2003: $67,789 million	*Government Expenditures (capital inclusive)* 2004: $7,103 million 2003: $6,809 million
New Mexico	*U.S. Census Population Estimates* 2006: 1,954,599 2004: 1,900,620 2003: 1,877,598 2000: 1,819,046 (25.0% rural population)	*Gross State Product* 2004: $63,645 million 2003: $57,453 million	*Government Expenditures (capital inclusive)* 2004: $9,591 million 2003: $9,284 million
North Dakota	U.S. Census Population Estimates 2006: 635,867 2004: 635,848 2003: 632,620 2000: 642.200 (44.1% rural population)	*Gross State Product* 2004: $22,692 million 2003: $21,703 million	*Government Expenditures (capital inclusive)* 2004: $2,925 million 2003: $2,824 million
Vermont	U.S. Census Population Estimates 2006: 623,908 2004: 620,795 2003: 618,616 2000: 608,827 (61.8% rural population)	*Gross State Product* 2004: $21,992 million 2003: $20,580 million	*Government Expenditures (capital inclusive)* 2004: $3,213 million 2003: $3,055 million

Appendix

State Data Sources for Appendix U

1.1 Total Personal Health Care Expenditures

Centers for Medicare and Medicaid Services, Office of Actuary, (February 2007). *Health Expenditures by State of Providers: State-specific Tables, 1980-2004*. http://www.cms.hhs.gov/NationalHealthExpendData/downloads/nhestatespecific2004.pdf . CMS' definitions and explanation of type-of-service and source-of-funds categories see web link: http://www.cms.hhs.gov/NationalHealthExpendData/downloads/quickref.pdf

1.2 State and Federal Financing

National Association of State Budget Officers (2005). *2004 State Expenditure Report.* http://www.nasbo.org/Publications/PDFs/2004ExpendReport.pdf

Milbank Memorial Fund, National Association of State Budget Officers, and Reforming States Groups (June 2005). *2002-2003 State Health Care Expenditure Report: Table 14.* http://www.milbank.org/reports/05NASBO/nasbotable14.pdf

Health Resources and Services Administration (HRSA) – Geospatial Data Warehouse (2007). *State Profiles.* http://datawarehouse.hrsa.gov/

Office of Rural Health Policy (ORHP), Health Resources and Services Administration (ND). *OHRP Awarded Grants by State.*http://ruralhealth.hrsa.gov/Map/index.htm

1.3 Health Insurance Coverage

U.S. Census Bureau, Current Population Report, (August 2006). *Income, Poverty and Health Insurance Coverage in the United States: 2005.* http://www.census.gov/prod/2006pubs/p60-231.pdf

Henry J. Kaiser Foundation (October 2006). *Individual State Profiles: Health Coverage and Uninsured. http://www.statehealthfacts.org/cgi-bin/healthfacts.cgi?action=profile. *Urban Institute and Kaiser Commission on Medicaid and the Uninsured estimates based on the Census Bureau's March 2005 and 2006 Current Population Survey (CPS: Annual Social and Economic Supplements.*

2.1 Healthcare Entities

Health Resources and Services Administration (HRSA) – Geospatial Data Warehouse (2007).. http://datawarehouse.hrsa.gov/

2.2 Healthcare Workforce

New York Center for Health Workforce Studies (October 2006) *The United States Health Workforce Profile* http://bhpr.hrsa.gov/healthworkforce/

HRSA – Geospatial Data Warehouse (June 2007). *Health Professionals Shortage Areas: Designated HPSA Summary.* http://datawarehouse.hrsa.gov/

2.3 Rural Health System and Networks

P. Carr Alaska Office of Rural Health (personal communication, May 2007)
H. Lichte New Mexico Office of Rural Health (personal communication, May 2007)
M. Miller, North Dakota Office of Rural Health (personal communication, May 2007)
D. Barton, Vermont Office of Rural Health (personal communication, May 2007)

3.1 Governance & Structure

Alaska Department of Health and Social Services (2007). http://www.hss.state.ak.us/
Nebraska Health and Human Service System (2007). http://www.hhs.state.ne.us/index.htm
New Mexico Department of Health (2007). http://www.health.state.nm.us/
North Dakota Department of Health (2007). http://www.health.state.nd.us/
Vermont Department of Health (2007). http://healthvermont.gov/

3.2 Medicaid Regulations

Kaiser Commission on and Medicaid and the Uninsured (January 2007). *Resuming the Path to Health Coverage for Children and Parents: 1 50 State Update on Eligibility Rules, Enrollment and Renewal Procedures, and Cost-Sharing Practices in Medicaid and SCHIP in 2006.* http://www.kff.org/medicaid/upload/7608.pdf

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Population Demographics

United States Census Bureau, Department of Commerce (2007). http://www.census.gov/

National Association of State Budget Officers (2005). *2004 State Expenditure Report.* http://www.nasbo.org/Publications/PDFs/2004ExpendReport.pdf

Financial Indicators

Centers for Medicare and Medicaid Services, Office of Actuary, (February 2007). *Health Expenditures by State of Providers: State-specific Tables, 1980-2004*. http://www.cms.hhs.gov/NationalHealthExpendData/downloads/nhestatespecific2004.pdf

National Association of State Budget Officers (2005). *2004 State Expenditure Report.* http://www.nasbo.org/Publications/PDFs/2004ExpendReport.pdf

New Zealand Data Source

New Zealand Ministry of Health (October 2005). *Director-General of Health's Annual Report on the State of Public Health 2005. http://www.moh.govt.nz/moh.nsf/0/78619E4262221A28CC2570A00003CBB6/$File/annualreport-healthandindependencereport2005-1.pdf*

New Zealand Ministry of Health (October 2006). *Director-General of Health's Annual Report on the State of Public Health 2006. http://www.moh.govt.nz/moh.nsf/indexmh/annual-report-0506?Open*

Appendix V

	Alaska	Nebraska	New Mexico
Workforce Recruitment and Education	**Alaska Center for Rural Health (Area Health Education Center-AHEC)** • *SORRAS Study*: Assessment of rural recruitment resources, strategies, and costs. **Alaska Healthcare Careers** – a single portal for applicants to access information on health care careers and job opening in the State. Created through the cooperation of hospitals, nursing homes, and other healthcare providers across the State, the University of Alaska, and a number of other partners. **Alaska Behavioral Health Careers Programs** – programs dedicated to increasing and improving the size and quality of Alaska's rural/frontier behavioral health workforce. Major components: • *Raven's Quest Summer Institute* (8-week program for college studies with undeclared majors); • Peer mentoring program to support *Summer Institute* graduates and other students pursuing behavioral health degrees; and • High school recruitment activities. **SEARCH, Alaska Exposure Program** – program supporting dental, medical, and mental health clinical student rotations in rural/remote Alaska communities to increase health professional interest in practicing within Alaska **Community Health Aide Training and Supervision Grants** (CHATS) - program funds for training and supervision of primary community health aides who provide health care services in rural communities throughout Alaska.	**Area Health Education Centers (AHECs)** **Rural and Metropolitan Basic Occupation Scholarship** (RAMBO) – Offered by the Community Action Partnership. Scholarships cover books, tuition and free, licensing/testing fees, and miscellaneous expenses associated with education need. Eligibility requirements: • Income at or below 185 FPL • In case management with Community Action of Nebraska, Health and Human Services, Workforce Development or other social service case worker. • Interested in pursing a two-year degree at a Nebraska community college in an allied health field **Rural Health Student Loan Program** – Forgivable student loans to Nebraska medical, dental, physician assistant, and graduate-level mental health students who agree to practice an approved specialty in state-designated shortage area. To be eligible, students, who are Nebraska residents, must be enrolled into or accepted for enrollment in a medical, physician assistant, dental, or graduate-level mental health training program in Nebraska. **NE Loan Repayment Program for Rural Health Professionals** – Communities within shortage area may apply for become approved loan repayment sites and must agree to provide equal match to state dollars Once approve, communities may recruit health professional to locate to the shortage area, agreeing to three-year practice commitment (and accept Medicaid patients).	**New Mexico Health Resources, Inc.** (NMHR) – private, nonprofit agency organized to support efforts to recruit and retain health care personnel. NMHR provides training to agencies interested in improving recruitment and retention of health care professionals. Program objective: developing connections between rural communities and centralized library resources. **One-Plus-Two Residency Program** *(University of New Mexico)* – Trains family practice physicians while helping to meet the needs of the underserved rural populations. Residents in program spend the first year at a large urban teaching center and last two years at a rural community hospital. **Locum Tenens** – Program designed to provide primary-care physicians provider relief for continue education, etc. The program exposes upper level primary care residents & recent graduates to practices recruiting for primary care physicians. **Recruitment Efforts**- Programs that explicitly seek to identify and recruit students from rural areas who presumably understand the realties of rural life and are more likely to return to a rural area when they complete training. (NCR) **Ryan White AIDS Funding & Rural Health** – NM uses Ryan White funds for AIDS education and training centers that provide training (including AIDS prevention & treatment) to rural healthcare providers. (NCR) **Rural Rotations** –community-oriented learning educational curriculum extended to the rural setting, which include clinic rotations with rural tutors and preceptors. (NCR)

Appendix

	Alaska	Nebraska	New Mexico
Workforce Recruitment and Education (continued)		**Rural Health Opportunities Program** (RHOP*)* – RHOP is designed for rural Nebraska students, traditional and nontraditional, interested in practicing in small communities throughout Nebraska. If selected, students obtain early admission into participating University of Nebraska Medical Center colleges upon completion of studies at Chadron State College or Wayne State College. The criteria for selection include academic potential and commitment to practicing in the rural areas of Nebraska.	**Area Health Education Centers (AHECs)** **Center for New Mexico Nursing Excellence** – nonprofit organization, leading efforts in recruitment, retention, and recognition of nurses through strategic planning, advocacy, and research efforts. Initiatives include: *Clinical Teaching Institute*: supporting nurses' professional development through education
Access to Care: Provider Location	**API Telebehavioral Health** – initiative to create, promote, and maintain access to behavioral health services through advanced technology in rural and frontier Alaska. Services are currently being provided through sites in Galena, Ft. Yukon, and Fairbanks and additional sites are coming "on-line" as the program expands. **FESC Consortium** – FESC clinics provide observation services associated with acute care inpatient hospitals until a patient can be transferred or is no longer in need of transport. Provision of these services requires additional staffing, equipment, and facility capacity. FESCs are treated as Medicare providers receiving reimbursement accordingly (demonstration project under MMA 2003). Southeast Regional Health Consortium - lead agency in the consortium.		**DOH Strategic Plan** – *Expand Access to Rural Areas through Telehealth Services.* • assist the Telehealth Commission by evaluating and integrating individual agency telehealth efforts • expand network of telehealth services in primary care facilities, etc. • implement behavioral health telehealth projects • increase Screening Brief Intervention Referral and Treatment telehealth services • expand the use of electronic medical records by telehealth providers and participants. End of FY 06, DOH estimated 160 established telehealth sites for training, consultation among physicians, or patient services; 20 telehealth sites are used for patient services; and 9 telehealth sites have specialty services available through network **Telehealth Commission** – created by the Telehealth Commission Act to encourage a single, coordinated system statewide to advance Telehealth in New Mexico. The Commission consists of 25 Governor-appointed members. Members include physicians & other healthcare providers, technology & telecommunications experts, educators, business representatives and state government representation

Appendix

	Alaska	Nebraska	New Mexico
			Telemedicine Program *(University of New Mexico* – program goals: improve quality of and access to health care services in rural areas, reduce the number of unnecessary patient transfers, increase the capacity of rural health care systems, reduce professional isolation, provide educational opportunities, and conduct telemedicine research and evaluation activities. • *Teleradiology* : 15 sites throughout Mexico and Arizona • Televideo: 3 sites on the University campuses (Santa Rosa, Las Vegas, Roswell) • Telepathology: one site in Roswell
Information Systems	**Alaska Automated Information Management System** (AKAIMS) **–** initiated in February 2003 to take advantage of a SAMHSA Center for Substance Abuse Treatment project promoting collaboration and use of technology among state and local government substance abuse treatment agencies. AKAIMS is a free, evolving web-based application and database that serves dual purposes - a management information system and clinical documentation tool.	**Nebraska DATABANK Program** - a web-based database of hospital utilization and financial performance indicators, designed to provide both the NHA and its participating hospitals with timely comparative data.	**New Mexico CheckPoint** *(New Mexico Hospital & Health Systems Association)* – Initiative's goal: develop consumer-focused initiatives that will provide reliable, valid measures of health care in New Mexico to facilitate the selection of quality health care and aid in quality improvement activities within the hospital field. Voluntary reporting program, and includes 14 evidence-based measures endorsed by the National Quality Forum.
Access to Care: Financial Assistance	**Chronic and Acute Medical Assistance** (CAMA) – program designed to help needy Alaskans who have specific illnesses get the medical care they need to manage those illnesses. Services covered: prescription drugs and medical supplies, (3 prescriptions per month) physician services directly to qualifying medical condition that, chemotherapy and radiation services (for cancer patients) and outpatient chemotherapy, laboratory and X-ray services. *Specific illnesses covered: terminal illness, cancer requiring chemotherapy, chronic diabetes or diabetes insipidus, chronic seizure disorders, chronic mental illness, or chronic hypertension.*	**Kids Connection** - health care coverage for qualified children developed by the State of Nebraska. Purpose: to provide health care to low-income and low-income uninsured children across the state. **Rural Housing Program -** Loans and grants are available to low-income applicants to remove health or safety hazards and/or improve or modernize their home. Examples of covered items include repair or replace water supply and sewer systems, heating systems, electrical wiring, foundations, deteriorating roof, insulation, etc. Program available only in communities of 20,000 or less (areas of Norfolk, Scottsbluff, Gering and Terrytown are eligible)	**Insure New Mexico! –** Council created by governor to reduce the number of people without health insurance and increase the number of employers offering health insurance to their employees. Initiatives recommended by council and signed into law by governor include: • State Coverage Insurance (SCI) • The Small Employer Insurance Program (SEIP) • The Health Insurance Alliance (HIA) • NM Medical Insurance Pool (NMMIP) employees. • Expanded New Mexikids

Appendix

	Alaska	Nebraska	New Mexico
Quality of Care	**Alaska's Small Hospital Performance Improvement Network** (ASHPIN) – in partnership with AK Office of Rural Health Policy in 2003 took steps to form a network of its smallest rural hospitals. ASHPIN's mission is to improve clinical, operational, and financial performance of Alaska's small rural hospitals to ensure patient access to appropriate healthcare services," As of Sept. 2004, 11 hospitals (6 serving MUAs) part of ASHPIN. **Outcomes Identification and System Performance Project** (OISPP) – quality improvement process implemented in the Division of Behavioral Health. • *The Alaska Screening Tools*, part of the performance measurement system, is an instrument designed to screen for substance abuse, mental illness, and traumatic brain injury.	**Rural Quality Improvement Steering Committee –,** Committee's purpose: provide the framework for developing a QI plan that is comprehensive, integrated and holistic in its approach to quality management. The Committee made recommendations to the Nebraska Hospital Association regarding forms, reports, and education that are needed to implement the model QI plan. **Nebraska Patient Safety Improvement Act** – Passed in 2005, the ultimate goal of the Act is to work together, learning from each other to consistently deliver high quality health care. It does this by establishing a reporting structure for adverse health events and/or "near misses", protecting the information reported to it from discovery, and sharing information designed to improve health care delivery systems and reduce the incidence of adverse health events. The Act called for the formation of the Nebraska Coalition for Patient Safety. **Nebraska Coalition for Patient Safety** – NCPS formed from passage of the 2005 Nebraska Patient Safety Improvement Act. The purpose of this act is to create a learning environment for health care providers and to foster a culture of quality. The coalition is comprised of organizations that are committed to achieving excellence in health care delivery. **CIMRO of Nebraska** – Works with health care providers to improve the quality of care delivered to people with Medicare, including assisting physicians and staff in hospitals, nursing homes, etc.	**New Mexico CheckPoint** *(New Mexico Hospital & Health Systems Association)* – Initiative's goal: develop consumer-focused initiatives that will provide reliable, valid measures of health care in New Mexico to facilitate the selection of quality health care and aid in quality improvement activities within the hospital field. Voluntary reporting program, and includes 14 evidence-based measures endorsed by the National Quality Forum. **Western Region Alliance for Patient Safety** (WRAPS) – one of 7 westerns states chartered member of the WRAPS (other states, Arizona, California, Utah, Colorado, Nevada, and Oklahoma). WRAPS purpose is to enhance and promote patient safety by advocating the adoption of regional safe practices in health care organizations.

Appendix

	Alaska	Nebraska	New Mexico
Quality of Care (continued)		**Patient Safety in Small Rural Hospitals** – Two year project is to implement the patient safety practices of voluntary medication error reporting and organizational learning to improve the safety of medication use in small rural hospitals. Currently 35 CAH (24 in Nebraska, 1 in Wyoming, and 10 in North Dakota) are participating in study. In this collaborative effort to share information about medication errors within CAHs, the project hospitals are building upon a nonpunitive voluntary reporting program to improve medication safety in their hospitals.	
Core Services: Behavioral/ Mental Health	**Behavioral Health Integration Project** – Collective state effort for infrastructure and service delivery enhancement in treating those with co-occurring disorders. Alaska used federal-awarded COSIG funds to support and strengthen ongoing CCISC activities to integrate systems and services for target population. The project officially began in January 2004. **API Telebehavioral Health** – initiative to create, promote, and maintain access to behavioral health services through advanced technology in rural and frontier Alaska. Services are currently provided through sites in Galena, Ft. Yukon, and Fairbanks; additional sites are coming "on-line" as the program expands **Alaska Mental Health Trust Authority** – provides leadership in shaping a comprehensive integrated mental health program for the most vulnerable Alaskans. • *Rural Technical Assistance:* encourage development of TA, community development, and grant writing in rural small communities. • *Rural Outreach*: provides travel to rural & remote communities to gain knowledge of issues, barriers, what works well, and what needs work in the communities.	**Children's Mental Health and Substance Abuse Statewide Infrastructure Grant** - funding to develop a state-wide Children's Mental Health and Substance Abuse delivery system. This infrastructure developed at the state, regional and local level. Key elements incorporated into the infrastructure: coordination across agencies, family centered approaches across systems; coordinated service plans, single point of accountability, outcome information, standard assessment, and establish best practices. **Behavioral Regional Governing Boards** - local units of government organized under the Interlocal Cooperation Act for the purpose of planning, organizing, staffing, directing, coordinating and reporting of the local service systems of mental health, and substance abuse within geographic areas (regions). Each of the 6 regions function as Regional Networks in the Behavioral Health System, acting on behalf of the Board, purchases needed services from within the region and, if necessary, from other service providers across the state.	**New Mexico Interagency Behavioral Health Purchasing Collaborative –** Part of the overall transformation of the New Mexico's behavioral health system, local collaboratives were developed/recognized for each of the 13 judicial districts (plus a limited number of local collaborative for tribes and pueblos). The basic functions of these collaborative are to help created or enhanced needed partnerships, will be the voice of local communities, and will be the entities of which state agencies will utilize for local input and decision-making. **Behavioral Health Planning Council** -

Appendix

	Alaska	Nebraska	New Mexico
	Outcomes Identification and System Performance Project (OISPP) – quality improvement process implement in the Division of Behavioral Health. • *The Alaska Screening Tools*, part of the performance measurement system, is an instrument designed to screen for substance abuse, mental illness, traumatic brain injury. **RurAL CAP** – a private, statewide, nonprofit organization working to improve the quality of life for low-income Alaskans providing resources and services to enhance child and family development, improve housing, and prevent substance abuse. • *FASD Prevention*: Project informs women of the dangers of drinking alcohol while pregnant. *Wellness & Substance Abuse Program*: counseling services to employees & their families, FASD prevention, etc.		
Core Services: Dental Health	**Adult Dental Medicaid Enhancement Program** – In spring of 2007, changes to Alaska's Adult Dental Program will be implemented to include preventative and restorative services for adults 21 years or older who receive Medicaid services. • preventative services including: exams, cleaning, tooth restoration or extraction, or upper and lower denture • coverage will pay up to $1,150 for each individual, per year **Healthy Alaska Fund** (HAF) – supports Alaska's community health centers and their patients in 115 communities across the state, serving 65,000 Alaskans. Oral health, including preventive and urgent care, is the top priority for HAF. **Alaska Dental Action Coalition**		**Mobile Dental Van** – Covenant Health System in Lubbock, TX has a mobile services program, which includes a mobile dental van in New Mexico for children and a primary care mobile clinic (NCR)

Appendix

	Alaska	Nebraska	New Mexico
Core Services: Elderly and Disability Care	**Alaska Assisted Living System Improvement Project –** project's goal is to develop, through an intensive stakeholder involvement process, a framework for improvement of the assisted living system in Alaska, which will include an implementation plan. **Alaska Pioneer Homes –** state-wide system of assist-living facilities; a total of 6 homes through Alaska of which currently serving 441 seniors. Residents receive services that would otherwise be delivered in a nursing home or under the Older Alaskan Home and Community-Based Medicaid waiver. In 2004 legislation was passed to develop the state's first Pioneer and Veterans Home **Alaska Long Term Care and Cost Study –** study completed by the Alaska Mental Health Trust Authority to review and evaluate the programmatic and fiscal components of the Alaska's long term care system. (Final Report completed February 2006) **Personal Care Assistant Program** (PCA)– Home care services provided to enable functionally disabled and handicapped people of all ages and frail elderly to live in their own home. Services provided help people with difficulties in perform activities such as a bathing, dressing, and grooming, shopping and cleaning, and with other activities that require semi-skilled or skilled care. Currently serving more than 2,500 individuals in 125 communities. Services provided through two different PCA agency models: agency-based and consumer-directed PCA programs.	**Medically Handicapped Children's Program (MHCP) -** Provides family-focused services coordination/case management, specialty medical team evaluations for children in local areas, access to specialty physicians, and payment of treatment services. Specialty clinics for children and youth are teams which consist of specialty physicians, nutritionists, nurses, occupational therapists, physical therapists, psychologist, dentists, speech and hearing pathologists, and the family. The teams meet all at one time and in one place. Team membership depends upon the particular medical conditions being reviewed. The most important member of the teams is the family. Teams provide diagnosis of the medical concerns and problems, a written plan of treatment, and access to all the team members at one time and place. The family is able to carry a list of written recommendations home from the team clinic. **Senior Health Insurance Information Program** (SHIIP) – Provides information and counseling to older Nebraskans regarding Medicare, Medicaid, and health insurance. Trained volunteers make presentations at senior centers and other locations, as well as provide one-on-one counseling when requested. SHIIP volunteers provide accurate, objective information and help you to better understand your options so that you can make well-informed decisions	**Mi Via** – A self-directed plan option for low-income elderly and disabled adult and children. Individuals who choose to participant in the program are able to choose services they need, hire their own service worker, and decide here and how to spend their Mi Via budget. A consultant provides assistance as necessary. **planning and development grant from the Robert Wood Johnson Foundation*

Appendix

	Alaska	Nebraska	New Mexico
Core Services: Elderly and Disability Care (continued)	**CHOICES Medicaid Waivers** –provide home and community-based care for those eligible. CHOICES provides an alternative to nursing home care, gives help needed to remain home, and assistance to families caring for elders or disabled at home. Services may include respite care, transportation, adult daycare, environmental modification, specialized private duty nursing, chore services, and specialized medical equipment or supplies.		
Core Services: Other	**Qualis Health**, – provides case management services designed for patients with serious illnesses, injuries, and some chronic conditions through Alaska's Medicaid program. To improve health outcomes, nurse case managers advocate on the recipient's behalf for high quality, cost-effective health care. **Rural Alaska Juvenile Justice Program** (RJJP) – Rural Alaska Collaboration projects. The project involves hiring Community Justice Associates through non-profit agencies, units of local government, or tribal entities to assist in the supervision of delinquent or pre-delinquent youth in rural communities.		

Appendix

	New Zealand	North Dakota**	Vermont**
Workforce Recruitment and Education	**HBSS Training Initiative** - The Disability Services Directorate in conjunction with the Community Support Services Industry Training Organization (CSSITO) is implementing a national training initiative designed to boost the number of home-based support workers with foundation level training.	**Rural Opportunities for Medical Education** (ROME, *University of North Dakota, Department of Family Medicine*) – program for the 3rd year medical students. This program enables students to live and train in non-metropolitan communities to encourage them to practice in rural areas through North Dakota. **State/Community Loan Repayment** – 50/50 state and community match loan repayment program. This program is available to individuals in their last year of training or to physician already practicing in a medical shortage area **On-Site Training** *(University of North Dakota, School of Medicine)* – on-site training in mental health centers, alcoholic treatment units, & public health clinics, and had partnership with teaching hospitals including VA Med Center in Fargo and U.S. Air Force hospitals in Minot and Grand Forks.	**Scholarships for Rural Health Services** (*University of Vermont College of Medicine)* **–** $1.6 million in scholarships annually for the next 4 years to in-state students and selected group of out-of-state willing to practice medicine in Vermont. $400,000 per year will be allocated to support a program aimed at educating students about rural health care. **Rural Clerkship & Rotation** (*University of Vermont College of Medicine)* **–** rural health promotion strategies including a mentoring program in which students are paired with a community physician and clerkship rotations in rural communities across the State. **Training Nurses in Rural Health (***Vermont Department of Employment and Training*) **–**a rural health program to train critical care, operating room, and psychiatric nurses. **Rural HIV/AIDS Training (***University of Vermont)* **–** 3 HIV/AIDS clinics (prior only 1 clinic) in rural areas across the state. Primary care M.D.s in rural areas report wanting to participate in "mini-residencies" within these clinics to stay up-to-date with current HIV/AIDs information.
Information Systems	**The National Needs Assessment and Service Coordination (NASC) Information System -** development of a web-based disability information system. Currently the 15 Ministry-funded NASCs use a range of electronic and paper based forms to collect and transmit information. None of the information is shared, and the information collected via the databases is inconsistent and of limited use in defining the demographics of the Directorate's clients and the services they receive.	**Provider Access to Information** *(University of North Dakota)* –medical school library received a grant from the National Library of Medicine to improve the level of access to information available to rural providers to improve their information seeking skills.	**Information Systems**

Appendix

	New Zealand	North Dakota**	Vermont**
Access to Care: Provider Location		**Public School Transportation & Health Care Access** – awarded a grant to study the feasibility of using public school transportation for health care access to southwestern North Dakota **Dakota Telemedicine System** – connects a central hospital to the VA Hospital in Fargo and 10 remote sites. **Provider Access to Information** *(University of North Dakota)* –medical school library received a grant from the National Library of Medicine to improve the level of access to information available to rural providers to improve their information seeking skills.	**Fletcher Allen Health Care Telemedicine (***in partnership Vermont College of Medicine*) **–** telemedicine network that also allows videoconferencing between rural health care facilities and the Burlington hub. This system increases access to both clinical care and medical education & training As of 1997, 18 sites around Vermont (and northern New York) were linked to Fletcher Allen's telemedicine system. Services include rural trauma care, surgical support and follow up, dermatology clinics, telepsychiatry, and renal services. **VanGo** – provide health and health education services to rural residents using a mobile unit. Target population include families with infants and young children, senior citizens, and underinsured and uninsured. **Vermont Public Transportation Association** – Several regional transport agencies in Vermont coordinate transportation for medically necessary travel for those who are Medicaid eligible
Access to Care: Financial Assistance			**Catamount Health** – Vermont's comprehensive health reform. Key features included employer assessment, premium assistance for low-income workers, • *Catamount Health Plan*: Coverage based on the typical non-group market product offered by the state, but with must less cost sharing by the individual or family. • *Chronic care initiatives*: Coverage expansion is paired with multiple chronic care initiatives, aligned with Vermont's blueprint for health.

Appendix

	New Zealand	North Dakota**	Vermont**
Quality of Care	**New Zealand Guidelines Group** (NZGG) – NZGG leads a movement towards the delivery of high quality health and disability services throughout New Zealand through a change in culture based on evidence and effectiveness. If appropriately implemented, an evidence-based approach will improve quality and outcomes by introducing effective care and services, while reducing unnecessary costs and ineffective care.		
Core Services: Behavioral/ Mental Health	**Mental Health Commission** – established in response to the recommendations of the 1996 Mason Inquiry into Mental Health Services. Its role is to ensure the implementation of the national mental health strategy by monitoring and reporting on the performance of key agencies.The Commission believes the mental health sector needs to identify and promote effective practices, and recognize excellence and innovation		
Core Services: Dental Health			**Dental Subsidies** – program subsidizing a dental practice in return for the dentist's commitment to retreat a specific volume of Medicaid patients. Local community partners used state and private foundation grants to cover start-up costs.
Core Services: Elderly and Disability Care	**Kimberley Centre** - the last institution for adults with intellectual disability in the country. A decision to close it was made by the Minister of Health and Minister for Disability Issues in 2001 after a lengthy planning process spanning several years which involved wide consultation and assessment of each resident's support needs.		

	New Zealand	North Dakota**	Vermont**
Core Services: Other			**Catamount Health Reform, Chronic Care Initiative** – Coverage expansion is paired with multiple chronic care initiatives, which aligned with VT's blueprint for health. The blueprint, managed by the VT Department of Health, is a public-private collaborative approach that seeks to improve the health of people living with chronic diseases and prevent the increase of chronic disease by utilizing the

**States were selected and used in Navigant study, but were not specifically identified by the Wyoming Health Care Commission as key systems of interest in this study. We included both Vermont and North Dakota in our comparison of political entities using data gather and reported in the Navigant's *Wyoming Rural Healthcare Study (April 2005*).