CHAPTER 1: DEVELOPMENT OF WYOMING-SPECIFIC KEY INDICATORS AND DEFINITIONS

We conducted the first component of this Study to develop definitions and indicators that can be applied to Wyoming for the distribution of State healthcare resources. Our intent was to provide a Wyoming-specific framework that we could use in the analytical phase of this project and that the State can use as it moves forward in improving healthcare access in rural areas. At the same time, we recognize that Federal agencies such as the Health Resources and Services Administration (HRSA) use their own definitions for purposes of defining shortage areas, evaluating grant applications and similar purposes. We have provided guidance to Wyoming regarding use of Federal and Wyoming-specific definitions.

Overview of Chapter

In this chapter we:

- Develop Wyoming definitions of urban, rural and frontier
- Develop key indicators of availability of services
- Develop indicators of quality of care

Wyoming Definitions of Urban, Rural and Frontier

We took the following steps in developing Wyoming definitions for this Study:

- *Researched Existing Definitions and Analysis Approaches* – We considered definitions used by various Federal agencies and other organizations for a wide range of purposes.
- *Assessed Applicability to Wyoming* – Existing definitions are generally based on population clusters and population density in much more highly populated areas than Wyoming. They do not adequately distinguish between many very different Wyoming communities and outlying areas that have different healthcare needs and different healthcare resources.
- *Identified Alternative Definitions and Approaches* – We identified a set of alternatives based on approaches that have been developed for similar issues in other areas.
- *Developed Final Definitions and Analysis Approach* – The recommended set of Wyoming definitions will help to provide a better understanding of the challenges that the State's populations face in obtaining core healthcare services and the possible solutions that the State may pursue.

Existing Definitions of Urban, Rural and Frontier

Federal and state agencies use a variety of definitions to classify areas as more or less urban[5]. These classifications are used for a wide range of purposes, such as economic studies of labor and markets, planning for zoning and development, infrastructure analysis, agricultural development and homeland security. Some definitions are more appropriate than others for understanding healthcare needs and resources.

In the public health arena, the most familiar framework in classifying an area as urban, rural or frontier is based on a three-step process: first, areas are defined as "urban" or metropolitan based on population concentrations or density; second, areas that do not meet these urban or metropolitan definitions are considered "rural"; and third, rural areas with a population density level less than six[6] or seven[7] persons per square mile are defined as "frontier".

Several Federal programs require applicants to show that they are located in non-metropolitan or rural areas using these definitions.[8] Therefore, Wyoming and other states must be able to provide data demonstrating that certain areas meet Federally-accepted definitions if they are to obtain benefits such as enhanced Medicare reimbursement for their rural area providers.

The United States Census Bureau defines urbanized areas and urbanized clusters based on small geographical units called census blocks. An urbanized area is a contiguous group of census blocks, each with a population density greater than 500 people per square mile and that together encompass a population of more than 50,000. An urbanized cluster is a similar group that together encompasses a population of at least 2,500 people but less than 50,000 people. The Census Bureau does not explicitly define the population density that constitutes a rural area; rather it defines a rural area simply as one that is not in an urban area or urban cluster.[9] Table 1.1, on the following page, summarizes these definitions.

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[5] Western Interstate Commission for Higher Education, "Defining and Describing Frontier Areas in the United States: An Update, Letter to the Field No. 22." Available online: http://www.wiche.edu/MentalHealth/Frontier/letter22.asp.

[6] Rural Policy Context, "Frontier Areas, Definitions from the Frontier Education Center." Available online: http://www.rupri.org/resources/context/fa.html.

[7] Western Interstate Commission for Higher Education, "Defining and Describing Frontier Areas in the United States: An Update, Letter to the Field No. 22." Available online: http://www.wiche.edu/MentalHealth/Frontier/letter22.asp.

[8] Washington State Department of Health, "Rural Definitions for Reimbursement and Program Eligibility," *Washington Rural Health Assessment Project.*

[9] United States Census Bureau, "Appendix A: Census 2000 Geographic Terms and Concepts." Available online: http://www.census.gov/geo/www/tiger/glossry2.pdf.

Table 1.1: United States Census Bureau's Definitions of Urban and Rural[10]

Classification	Definitions
Urban/Rural	*Urban Area*: Population density greater than 500 people per square mile and population greater than 50,000
	Urban Cluster: Population between 2,500 and 50,000
	Rural Area: Any area not in an Urban Area or Urban Cluster

The Centers for Medicare and Medicaid Services (CMS) uses the Census Bureau definition of a rural area as the eligibility criterion for Rural Health Clinics, which are eligible for enhanced reimbursement from Medicare and Medicaid.[11]

The United States Office of Management and Budget (OMB) defines a Metropolitan Statistical Area (MSA) as a county or group of counties with at least one Census Bureau-defined Urbanized Area of a population of 50,000 or more. The OMB defines a Micropolitan county as having at least one Census Bureau-defined Urban Cluster of at least 10,000 but less than a population of 50,000. A Metropolitan or Micropolitan area can include adjacent territory that has a high degree of social and economic integration with the core as measured by commuting ties. A county that includes neither an Urban Area nor an Urban Cluster is a non-metropolitan county.[12] CMS uses MSA classifications to categorize hospitals as either urban or rural for purposes of Medicare reimbursement.

The Goldsmith Modification of the OMB methodology (named for the author who proposed it) is based on census tracts/zip codes rather than just county boundaries, and takes commuting patterns into account.[13] It is intended to identify rural areas within large Metropolitan Statistical Areas, for example, San Bernardino County, California, which contains both very urban and very rural areas. The Goldsmith MSA modification is the basis for the Small Hospital Improvement Grant Program.

The Census Bureau's and OMB's definitions were developed for a variety of reasons unrelated to healthcare. For purposes of healthcare, many state health officials have recognized the need for definitions that more accurately identify healthcare needs in rural

[10] Washington State Department of Health, " Rural Definitions for Reimbursement and Program Eligibility," *Washington Rural Health Assessment Project*, p. 7.
[11] Washington State Department of Health, " Rural Definitions for Reimbursement and Program Eligibility: Table 2," *Washington Rural Health Assessment Project*, p. 3.
[12] Ibid.
[13] United States Department of Health and Human Service, Health Resources Services Administration, Office of Rural Health, "Improving the Operational Definition of "Rural Areas" for Federal Programs." Available online: http://www.ruralhealth.hrsa.gov/pub/Goldsmith.htm.

areas. The States of Washington, Wyoming, Alaska, Montana and Idaho (WWAMI), through their Rural Health Research Center along with the Health Resources Services Administration's Federal Office of Rural Health Policy and the Department of Agriculture's Economic Research Service, jointly developed the Rural-Urban Commuting Areas (RUCAs) classification scheme. RUCA codes define ten categories of communities based on census tracts and zip codes according to size and commuting patterns.[14] Table 1.2 summarizes these definitions.

Table 1.2: Rural-Urban Commuting Area Definitions of Urban and Rural[15]

Classification	Definitions	
Rural-Urban Commuting Areas (RUCAs)	RUCA codes define 10 categories of communities based on census tracts and zip codes according to population size and commuting patterns:	
	1 – Metro Area Core (>50,000)	6 – Large Town, Low Commute
	2 – Metro Area, High Commute	7 – Small Town Core (2,500 – 9,999)
	3 – Metro Area, Low Commute	8 – Small Town, High Commute
	4 – Large Town Core (10,000 – 49,999)	9 – Small Town, Low Commute
	5 – Large Town, High Commute	10 – Rural Area (<2,500)

Rural-urban commuting areas 4 – 10 are eligible for grants issued by the Federal Office of Rural Health Policy, including rural health outreach, network development and rural automated external defibrillators grants.[16]

While not a definition that distinguishes urban and rural areas, the Federal definition of Health Professional Shortage Areas is an important designation for healthcare. The Health Resources and Services Administration Bureau of Health Professions defines a Health Professional Shortage Area (HPSA) as a geographic area or population group that has a shortage of primary medical care, dental health providers or mental health providers. This classification system may apply to either urban or rural areas, population groups or medical or other public facilities. Many Federal programs, the most prominent of which is the National Health Service Corps, use the HPSA designation to determine eligibility or as a

[14] United States Department of Agriculture, Economic Research Service, "Rural Urban Community Area Codes." Available online: http://www.ers.usda.gov/data/ruralurbancommutingareacodes/.
[15] Washington State Department of Health, "Rural Definitions for Reimbursement and Program Eligibility," *Washington Rural Health Assessment Project*, p. 9.
[16] Ibid.

funding preference.[17] Table 1.3 presents the definition for HPSAs and the factors that contribute to the defining a HPSA for primary care purposes.

Table 1.3: Health Professional Shortage Areas Definition

Classification	Definitions
Health Professional Shortage Areas (HPSAs)	HPSA is defined as a geographic area or population group with a shortage of primary medical care, dental health providers or mental health providers. Primary care scoring methodology includes four factors: 1. Population-to-primary care physician ratio 2. Percentage of the population with incomes below 100 percent of poverty level 3. Infant mortality rates/low birth weight rates 4. Travel time/distance to nearest available source of care

Some states have developed their own definitions of urban and rural, reflecting their own demographics, geography and in some cases healthcare needs. Oregon, for example, has developed a method based on distance and defines rural as all geographic areas that are 10 or more miles from the center of a population center of 30,000 or more. Oregon uses its definition as the criterion for state physician tax credit qualification.[18] The State of Washington defines a rural county as having fewer than 100 people per square mile and uses its definition for economic development purposes.[19]

Applicability of Existing Definitions to Wyoming

Definitions based on typical nationally-determined population densities provide too little detail for Wyoming because most of the State is forced into just two categories: rural and frontier. For example, according to the OMB's definition of a Metropolitan Area, – a county or group of counties with at least one Census Bureau-defined urban area of 50,000 people – only two Wyoming counties are considered metropolitan or urban, Laramie and Natrona. Wyoming's other counties are considered non-metropolitan, "rural" or "frontier", thus providing no differentiation among the towns within them.

[17] United States Department of Health and Human Services, Bureau of Health Professions, "Health Professional Shortage Area Primary Medical Care Designation Criteria." Available online: http://bhpr.hrsa.gov/shortage/hpsacritpcm.htm.

[18] Oregon Health and Science University, Office of Rural Health, "Definitions of Rural and Assessing Healthcare Needs." Available online: http://www.ohsu.edu/oregonruralhealth/what%20is%20rural.html.

[19] Washington State Legislature, "Revised Code of Washington (RCW), Title 43, Chapter 43.168 Section 43.168.020." Available online: http://www.leg.wa.gov/RCW/index.cfm?fuseaction=section&section=43.168.020.

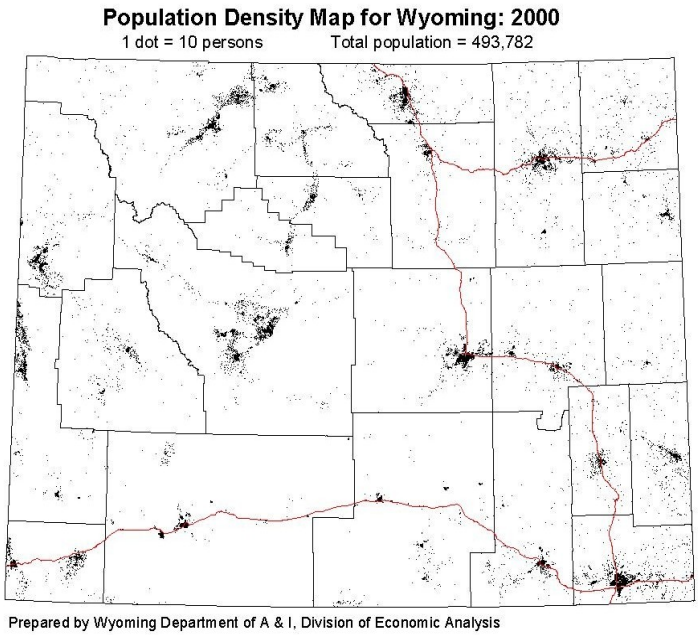
Density-based definitions do not reflect the actual distribution of Wyoming's healthcare needs and resources. Healthcare needs are closely associated with population concentrations and Wyoming's populations are generally concentrated along a few major travel routes and waterways. For purposes of identifying healthcare needs and providing resources, the focus in Wyoming must be on population concentrations within counties, not at the county level on which existing definitions of rural and frontier currently focus. Sweetwater County is an illustrative example:

- Sweetwater County has approximately 37,000 people in an area of 10,425 square miles, or 3.7 persons per square mile, which under the existing definitions means the entire county is a frontier area.

- However, as Figure 1.1 illustrates, more than 80 percent of those 37,000 people live in Rock Springs and Green River. These people are within 10 miles of Memorial Hospital of Sweetwater County.

- For the remaining 7,000 or so people in the County, healthcare access depends largely on their distance from Rock Springs, if they live west of the Continental Divide, and from Rawlins where Memorial Hospital of Carbon County is located, if they live east of the Divide.

Figure 1.1: Wyoming Population Density in 2000[20]



[20] Wyoming Department of Administration and Information, Division of Economic Analysis, "Population Density Map for Wyoming: 2000." Available online: http://eadiv.state.wy.us/demog_data/pop2000/popden_block.jpg.

Therefore, Wyoming needs a set of definitions that reasonably describes the healthcare needs of these people and others like them around the state.

Alternatives to Urban, Rural and Frontier Definitions for Identifying Healthcare Needs in Wyoming

We identified several possible methods for developing definitions for Wyoming. The simplest approach would be to base the definitions on population density of urban, rural and frontier, as several Federal agencies do, but with categories that more accurately reflect the range of community sizes in Wyoming. Data on population density are readily obtainable. However, this approach, as noted previously, does not reflect the actual distribution of Wyoming's healthcare needs and resources.

State Medicaid Managed Care Programs' Approach

A more useful approach that is used in managed care to assess sufficiency of provider networks is based on distance or travel time to services. For example, in some states' Medicaid managed care programs the managed care organizations must be able to assure the state that all members have a primary care provider within 30 miles of the member's residence. Some states' Medicaid managed care programs use travel time to services in assessing the sufficiency of the managed care organizations' provider networks.[21]

The Missouri Medicaid managed care program specifies its access criteria as 20 miles of travel to primary care and hospital services, but makes exceptions in rural areas if the normal practice is that people travel further. The Texas Medicaid managed care program specifies its access criteria both in miles and minutes of travel time – for example, 30 miles or 45 minutes.[22] The Kansas Medicaid managed care program uses different travel times guidelines for urban and rural areas, while Oregon's Medicaid managed care program specifies set travel times, but allows for shorter time if it is consistent with community standards. Vermont's Medicaid managed care program uses a specified time guideline.[23] Table 1.4, on the following page, gives more detail on these states' distance-and travel time-based healthcare access criteria.

[21] Center for Health Policy Research, George Washington University, "Negotiating the New Health System: A Nationwide Study of Medicaid Managed Care Contracts," pp. 3-278 – 3-287.
[22] Ibid.
[23] Ibid.

Table 1.4: Examples of States' Distance- and Travel Time-Based Healthcare Services Access Criteria

State	Type of Service	Criteria
Missouri	Primary Care	20 miles, except in Rural Areas where usual and customary practice is longer
	Hospital	20 miles, except in Rural Areas where usual and customary practice is longer
Texas	Primary Care	30 miles or 45 minutes
	Hospital	30 miles or 45 minutes
	Other Specialty	30 miles or 45 minutes
Kansas	Primary Care	Urban – 20 minutes Other – 30 minutes
Oregon	Primary Care	One hour or community standard, whichever is less
	Other	45 minutes or community standard, whichever is less
Vermont	Primary Care	30 minutes
	Other	One hour (Radiology) 30 minutes (Mental Health)

United States Veterans Health Administration's Approach

In an approach similar to that used by some state Medicaid managed care programs, the Veterans Health Administration (VHA) identifies where healthcare resources for veterans are needed based on travel time to services. The VHA's approach was developed as part of the planning process the VHA undertook in July 1999 to respond to changing healthcare practices, veterans' demographics and the high cost of maintaining VHA health facilities. The VHA's planning process, known as Capital Asset Realignment for Enhanced Services (CARES), is a comprehensive, system wide approach to, and ongoing process for, identifying the demand for VHA care and projecting the appropriate function, size and location for VHA facilities.[24]

As part of this planning process, the VHA developed travel time standards to primary, hospital and tertiary care to measure access to healthcare services for a distinct veteran

[24] Secretary of Veterans Affairs, Office of the Secretary, "CARES Decision," (May 2004). Available online: http://www1.va.gov/cares/.

population in a geographic area. The VHA developed its approach as an alternative to its former methodology for measuring access, which was based on determining where patients from a given county sought specific types of services, irrespective of distance or travel time to the services. The VHA sought to develop a methodology that was capable of greater precision in measuring access, but also provided more information to support planning decisions.[25]

In establishing travel time standards, the VHA considered factors that affect travel time to adjust for differences in population density and types of roads. While the VHA acknowledged that factors such as road conditions, number of lanes and seasonal changes affect travel time, they determined that these factors are not measurable or easily defined. Therefore, the VHA focused on the effect that population density has on road networks and thus, travel times. Table 1.5 presents the density classifications that the VHA used in its analyses.[26]

Table 1.5: Veterans Health Administration's Urban, Rural and Frontier Definitions

Classification	Population Density per square mile
High Urban	3,000 or more
Urban	1,000 to 2,999
Transitional Urban	100 to 999
Rural	7 to 99
Frontier or Highly Rural	1 to 6

The VHA then determined the average speed for different types of roads in each of the three urban population density classifications based on the 2002 Urban Mobility Report, and assigned the maximum average speed allowed for the rural and frontier classifications. As a result of its analysis of speed adjustment factors for types of roads in different populated areas, the VHA determined that there were not significant travel time differences among the three urban classifications, and established the guidelines shown in Table 1.6, on the following page, for travel times for three categories of service.[27]

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[25] Secretary of Veterans Affairs, VHA Office of Policy and Planning, "Appendix P – Measuring Access," *National CARES Plan* (September 2002). Available online: http://www1.va.gov/cares/docs/DNP_appP.pdf.

[26] Secretary of Veterans Affairs, VHA Office of Policy and Planning, "National Travel Time Analysis: Adjusting for Population Density and Type of Road to Determine Time-based Service Networks for VHA Sites, VHA Planning Systems Support Group," (September 2002). Available online: http://www1.va.gov/cares/docs/DNP_refAccessCalculation.pdf.

[27] Ibid.

Table 1.6: Veterans Health Administration's Travel Time Criteria for Healthcare Services

Type of Service	Travel Time Criteria
Primary Care	Urban – 30 minutes Rural – 30 minutes Highly Rural – 60 minutes
Acute Hospital	Urban – 60 minutes Rural – 90 minutes Highly Rural – 120 minutes
Tertiary Care	Urban – 240 minutes Rural – 240 minutes Highly Rural – Community Standard

After establishing its travel time guidelines for the three categories of services, the VHA then measured the travel time from each enrollee's zip code to the nearest VHA provider. In measuring travel time in urban, rural and highly rural areas, the VHA estimated travel speeds based on three categories of roads – primary, secondary and connecting. The resulting travel speed estimates ranged from 20 miles per hour to 65 miles per hour.[28]

The VHA also set access thresholds; a certain percentage of veterans must be able to travel to the services within the travel time guidelines or a limited number of veterans can live outside the travel time guidelines. The VHA then identified an "access issue" if a community failed to meet one or the other of the specified thresholds. For example, a community with a primary care access issue was one in which less than 70 percent of enrollees were within 30 minutes of the nearest primary care provider in urban and rural areas and 60 minutes in highly rural areas, or one in which there were more than 11,000 enrollees who lived outside the travel time guidelines.[29]

Assessment of Approaches to Identifying Healthcare Needs and Recommendation

There are trade-offs between simplicity and accuracy among the three main approaches for identifying healthcare needs: population density-based approach, travel time-based approach and distance-based approach.

[28] Secretary of Veterans Affairs, VHA Office of Policy and Planning, "National Travel Time Analysis: Adjusting for Population Density and Type of Road to Determine Time-based Service Networks for VHA Sites, VHA Planning Systems Support Group," (September 2002). Available online: http://www1.va.gov/cares/docs/DNP_refAccessCalculation.pdf.

[29] Secretary of Veterans Affairs, VHA Office of Policy and Planning, "Appendix P – Measuring Access," *National CARES Plan* (September 2002). Available online: http://www1.va.gov/cares/docs/DNP_appP.pdf.

- The population density-based approach is the simplest because the data is readily available; however, the data does not accurately distinguish among Wyoming communities.

- The travel time-based approach is the most accurate for measuring access. The relationships between travel time, needs for particular kinds of services and health outcomes are well-documented and easily understood; however, analysis of travel time data is complex and data on travel times are not available for many smaller communities.

- The distance-based approach offers simplicity, in that mileage data is readily available and can be used with data on locations of population clusters and healthcare resources; however, mileage standards may not address Wyoming-specific weather conditions and geographic characteristics. Nevertheless, we believe that the distance-based approach offers a balance of simplicity and accuracy.

Based on our research, the VHA approach provides a sound methodology to adapt to Wyoming for purposes of measuring access to services and identifying areas of need.

Indicators of Availability of Services

Our approach to adapting the VHA methodology to Wyoming was to:

- Identify a consistent and defensible set of core services for Wyoming based on whether they meet two of the following criteria:

  - *High Demand* – A service that is needed (or could be needed) by a large portion of the population at some point in their lives

  - *Time-Sensitive* – A delay in receiving the service is likely to result in poor health outcomes

  - *Time-Intensive* – A service that is needed repeatedly or continuously for an extended period of time (e.g., renal dialysis)

  Classifying services as time-sensitive or time-intensive highlights the important connection between travel time and availability of services within a community.

- Use the VHA driving time guidelines, but convert them to distances using reasonable Wyoming travel speed estimates.

- Apply the distance guidelines to Wyoming-specific categories of community size to identify a set of services that should be accessible within the distance guidelines.

Identification of Core Services for Rural Healthcare

We conducted a review of the literature on access to care in rural areas as a first step in identifying a list of basic or core services. Many articles that we reviewed focused on one or two services needed in rural areas, but did not provide reasons for addressing those services instead of others.[30, 31, 32, 33, 34, 35] Based on our literature review, we identified the following initial list of services to consider as basic to rural healthcare:

- Primary Care Services
- Obstetrical Care Services
- Mental Health/Substance Abuse Services
- Emergency Transportation Services
- Dental Services
- Home Health Services

Based on discussions with the Wyoming Rural Healthcare Study Subcommittee's members and staff, we revised and expanded the set of core services. Next, we evaluated these services in relation to the three criteria outlined on the previous page. Table 1.7, on the following page, shows the expanded set of core services and our evaluation of them in relation to the three criteria. For inpatient hospital and pharmacy services, we and some of the Subcommittee members questioned whether these services meet the time-sensitive criterion (as indicated by a question mark in the cells in Table 1.7 below) and thus, at least two of the three criteria, but we have included them in our analyses in the following chapters.

[30] Elizabeth M. Duke., "Prepared remarks - 340B Coalition Conference, Fifth Annual Meeting," (July 12, 2001). Available online: http://newsroom.hrsa.gov/speeches/340b-new-logo.htm.
[31] United States Department of Health and Human Services, Bureau of Health Professions, "Summary of criteria for designation of Health Professional Shortage Areas, including primary medical care, dental care, and mental health care." Available online: http://bhpr.hrsa.gov/shortage.
[32] National Rural Health Association, "What's Different About Rural Health Care?" Available online: http://www.nrharural.org/pagefile/different.html.
[33] Manitoba Minister of Health, "Core Health Service Categories and Inventory of Existing Services," (2000). Available online: http://www.gov.mb.ca/health/rha/core.pdf.
[34] HRSA Office of Rural Health, "Funding." Available online: http://ruralhealth.hrsa.gov/funding.
[35] Agency for Health Care Policy and Research (AHCPR), "Research in Action: Improving Health Care for Rural Populations." Available online: http://www.ahrq.gov/research/rural.htm.

Table 1.7: Evaluation of Core Services Against Demand, Time-Sensitive and Time-Intensive Criteria

Core Services	High Demand	Time Sensitive	Time Intensive
Primary Care Services	X		X
Obstetrical Care Services	X	X	X
Mental Health/Substance Abuse Services	X		X
Emergency Transportation Services	X	X	
Dental Services	X		X
Home Health Services	X		X
Inpatient Hospital Services	X	?	
Nursing Facility Care Services	X		X
Pharmacy Services	X	?	

Note: The question marks indicate uncertainty that the service meets the time sensitive criterion.

We also identified a list of desirable services — that is, services that are beyond the basic or core set, but which are available to residents in the State's largest cities — to evaluate against the three criteria we developed for core services. Based on discussions with the Subcommittee members and Healthcare Commission's staff, we expanded the list of desirable services to the following:

- Medical/Surgical Specialists (e.g., Cardiologists, Oncologists, Orthopedic Surgeons)
- Therapies (OT, PT, ST)
- Non-Emergency Surgery, Including Major Surgery
- Durable Medical Equipment
- Advanced Radiology (MRI, PET)

These services, although desirable, may not meet the criteria outlined for core services in a rural setting and may not be economically and practically feasible to provide to all rural residents. We recognize that in certain circumstances, Wyoming residents may need any of the above services urgently. However, we believe that the Study's recommendations should focus on broadly applicable solutions rather than solutions for unusual cases.