Section V. Medical Care Resources

Prevention of diseases, illness, and deaths are fundamental goals of public health efforts. Public health professionals distinguish between primary and secondary prevention. Primary prevention involves improvements in social conditions and reduction of risk factors that cause disease and illness (Barnett et al, 1998). Secondary prevention involves treatment and rehabilitation of persons with established disease and those at high risk of developing disease.

Accessibility to adequate medical care is a critical element of secondary preventive efforts to reduce disease morbidity and mortality. In much of rural Appalachia, there are significant barriers to adequate medical care including physical distance, terrain, lack of public or private means of transportation to providers, lack of health insurance, and inability to pay for prescription drugs (Behringer, 1994).

In addition to reducing disease morbidity and mortality, medical efforts are devoted to improving the quality of life by minimizing the poor quality associated with chronic and other diseases to the relief of pain, disfigurement, and disability (Bunker, 2001).

In this analysis we examine the geographic distribution of medical care resources in order to help identify counties and regions which have deficiencies in resources. Combined with mortality and morbidity analyses, analyses of medical care resources may aid in identifying relationships between population health and proximity, to various elements of the health care system.

The presence of medical care facilities, however, does not guarantee that access and utilization of these facilities is equal among resident populations. A number of factors influence utilization of medical resources and services, including health insurance to defray the cost (Williams-Pickle and Su, 2002), trust in both the medical care delivery system and individual provider (Hall, 2001), severity of disease or illness, and physical proximity of medial resources.

Data and Methods

Data on medical care resources and health professionals has been taken from the Area Resource File (February 2001 edition). The Area Resource File (ARF) contains more than 6,000 county-specific health resource variables. ARF includes information on health facilities, health professions, resource scarcity, economic activity, and geographic codes and descriptors for all counties and county equivalents in the U.S. This file is compiled from multiple sources, including the American Medical Association Physician Master File, by the Office of Health Professions Analysis and Research, Department of Health and Human Services. We have examined the following variables for this analysis:

General
-Health Professional Shortage Areas
-Health Service Areas
**Hospital-Based Services**
- Hospitals
- Population ratio per Hospital Bed
- Short-term Hospitals
- Population ratio per Short-term Hospital Bed
- Hospitals with Cardiac Intensive Care Units (CICUs)
- Population ratio per CICU
- Hospitals with Cardiac Catheterization Lab
- Hospitals with Rehabilitation Care

**Special Physicians**
- Population ratio to Physicians active in Patient Care
- Population ratio to CVD Specialty Physicians
- Population ratio to Pulmonary Disease Physicians
- Population ratio to Colon/Rectal Surgery MDs
- Population ratio to Diagnostic Radiology MDs
- Population ratio to Emergency Medicine MDs
- Population ratio to Pathology MDs
- Population ratio to Physical Medicine/Rehab MDs
- Population ratio to General Preventive Medicine MDs
- Population ratio to Public Health MDs
- Population ratio to Radiology MDs

We have utilized these variables to construct the general landscapes of medical care resources. In order to enable an assessment regarding the relative adequacy of each medical care resource, we have calculated population ratios rather than for example, examining the number of physicians in each county. Difficulty in making comparisons between urban and rural counties would result from examining only the number of each resource. On the other hand, many hospitals serve much larger populations than exist in their individual counties and increasing mobility of physicians may improve the relative accessibility of their services.

With the exception of counties which have no medical care resources (of any particular type), the maps presented in this section are generated so that darker colors represent more adverse conditions in regards to medical care resources.

**Health Professional Shortage Areas**

Health Professional Shortage Areas (HPSAs) are designations which identify areas for which the primary care physician-to-population ratio is less than 1:4000. Counties have been classified into three categories: those for which there is no shortage, those for which a shortage exists in part of a county, and those for which a shortage exists in the entire county.

A map showing the distribution of HPSA codes for the year 2000 is presented on page 210. Of the 406 Appalachian counties used in this analysis, 108 counties have health professional shortages throughout the county, 189 counties have shortages in part of the county, and 109 counties have no shortages. Fairly large regions, identified by clusters of counties that have shortages for the whole county, are located in Central West Virginia, Eastern Kentucky, Northeastern Mississippi, and Central Alabama.

**Health Service Area Codes**

A health service area is defined as one or more counties that are relatively self-contained with respect to the provision of
routine hospital care. Service areas that include more than one county are characterized by travel between the counties for routine hospital care. Because many hospitals have health service specialties, their service area may be much broader than indicated by these health service area codes.

A map representing health service areas is shown on page 210.

**Hospitals**

All hospital data in the ARF are from the *AHA Annual Survey of Hospitals*, reporting for a twelve-month period: preferably October 1 through September 30 of the following year (ARF, 2001). To be reported as a "hospital", an institution must have at least six inpatient beds, cribs or pediatric bassinets which shall be continually available for the care of patients.

A map showing the distribution of hospitals in 1999 within the Appalachian region is shown on page 211. There were 81 counties in the region that had no hospitals and 203 had a single hospital. Appalachian counties with large metropolitan areas, such as Pittsburgh and Birmingham have medical schools, teaching hospitals, and are represented by large numbers of hospitals, relative to other Appalachian counties.

**Population ratio per Hospital Bed**

A map showing the population ratios for all 1999 hospital beds is shown on page 211. Population-to-hospital bed ratios provide an indication of the overall medical care resources available in a local area. More favorable population-to-hospital bed ratios are found in counties with metropolitan areas, but are also found in non-metropolitan counties throughout the region.

No clear clustering of unfavorable population-to-hospital bed ratios is apparent within the region.

**Short-term Hospitals**

Short-term hospitals are defined as hospitals that may provide either non-specialized or specialized care, and the majority of their patients stay for fewer than 30 days. A map showing the distribution of short-term hospitals is shown on page 212.

**Population ratio per Short-term Hospital Bed**

A map showing the population ratios for all 1999 short-term hospital beds is shown on page 212. The distribution of population to short-term hospital beds is roughly similar to the population-to-hospital bed ratio shown on page 211. Differences in these distributions may reflect tendencies of hospitals in counties with smaller populations to focus more on routine medical services.

**Hospitals with Cardiac Intensive Care Units (CICUs)**

The availability of cardiac intensive care, through cardiac intensive care units (CICUs), can reduce in-hospital deaths from myocardial infarction by approximately 30% (AHA, 1997). A maps showing the distribution of hospitals with CICUs is shown on page 213.
There were 296 counties in the region with no CICU, and fairly large areas for which there are large distances to the nearest CICU. More metropolitan areas within the region, such as Pittsburgh, Knoxville, and Birmingham have comparatively large numbers of CICU hospitals.

**Population ratio per CICU**

To assess the adequacy of CICU hospitals relative to local populations, we examined the population ratio per CICU bed. A map showing the population-to-CICU bed is shown on page 213.

Geographic differences in the number of CICU and the population-to-CICU bed provide an indication of the relative size of CICU units in each respective county.

**Hospitals with Cardiac Catheterization Labs and Rehabilitation Care**

Hospitals with specialized medical services are critical for decreasing fatality as well as improving the quality of life for individuals who have suffered from chronic disease and illness. A map showing the distribution of specialized cardiac services (cardiac catheterization and rehabilitation) is shown on page 214.

There were 318 counties that did not have hospitals with at least one cardiac catheterization lab and 326 counties that did not have at least one county with a cardiac rehabilitation unit. Large areas within the region do not have ready access to these critical services. Counties with metropolitan areas have a greater number of hospitals that offer these specialized services.

**Specialty Physicians**

Hospital-based services provide a general indicator of medical care availability but do not account for office-based physician practices that may provide critical preventive and treatment services at the local level. A series of maps showing the distribution of physicians of various specialties are presented on pages 215 to 219.

In each case we have examined the population-to-physician ratio to assess the relative adequacy of physician services in local areas.

The ratio of the population to physicians active in patient care in 1999 is shown on page 215. Favorable population-to-physician ratios were found throughout the region. Counties with less favorable ratios are found primarily in Southeastern Ohio, Southern and Central West Virginia, Eastern Kentucky, and North-Central Mississippi. There were 6 Appalachian counties with no physicians active in patient care in 1999.

The distribution of specialty physicians largely reflects the distribution of hospitals (and those with specialty services), however there is considerable variability among the distributions of specialty physicians. More common physician specialties, such as cardiovascular disease, emergency medicine, diagnostic radiology, and pathology, are widely dispersed throughout the region. However large areas within the region are lacking these specialty medical services. There appear to be a regional concentration, in Western Pennsylvania,
of physicians specializing in pulmonary disease and physical rehabilitation. Physician specialties that occur very sparsely among Appalachian counties are colon and rectal surgery, general preventive medicine, and public health.

Summary

Medical care resources are unevenly distributed among counties in the Appalachian region. These data suggest that counties with metropolitan areas have greater access to general medical services. In addition, hospitals and physicians offering services of a specialized nature tend to aggregate in more metropolitan and urban areas.

Many counties in Appalachia to not have ready access to critical resources for cardiovascular care and rehabilitation, which may contribute to excesses in cardiovascular related mortality identified in Section I.

References


Hospitals

Number of Hospitals, 1999

Population per Hospital Bed, 1999

Number of Hospitals
1
2
3
4 - 6
7 - 34
No Hospitals

Population
32 - 187
188 - 231
232 - 335
337 - 555
556 - 2402
No Hospital Beds
Total Population per General Preventive Medicine MD, 1999

Total Population per Public Health MD, 1999

Population
11085 - 36673
36674 - 76524
76525 - 143293
143294 - 213295
213296 - 586448
No MDs

Population
11085 - 36348
36349 - 89173
89174 - 200636
200637 - 379616
379617 - 1281666
No MDs