

Geography of Frontier America

The View at the Turn of the Century

January, 2000

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1. Abstract

In an effort to further the discussion of how to define frontier areas, the Office of Rural Health Policy provided start-up funding to the Frontier Education Center to examine this issue.

The first task was to determine which counties to include in the set of frontier counties. States were asked to identify the counties in their state that should be included in the database of frontier counties. This system worked very well and all of the states included (n+39) have agreed to the counties presented. Some states deleted counties from our list, others added counties. The Frontier Education center believes that the states have the knowledge to best categorize the counties in their states.

The Frontier Education center decided that the best way to present the resources and economic data was through the use of Geographic Information System (GIS) technology. GIS allows for data to be collected and located on maps as a visual analysis of the findings.

The project expanded as data was received from many sources. The Frontier Education Center now has a collection of more than 800 maps. The maps describe the locations of health services as well as information about the economy. The future presentation of the data and the maps will be Internet based. The best way to use the maps is interactively so that the data can be layered and different types of information can be viewed simultaneously. A sampling of national maps is included to demonstrate both health services in frontier counties and to create a picture of the frontier economy.

Analysis of the data has helped inventory the current status of frontier communities and initiate the development of a policy agenda for the future. We learned that health services are lacking in most frontier counties. The majority of counties have two or fewer services of any type and **as many as a quarter of a million people may be living in counties with no health services**. This situation needs immediate, additional study followed by action to establish services in those communities.

As advocates for frontier communities, the Frontier Education Center believes that new types of providers and facilities - and commitment - are essential in order to meet the health and human services needs of the four percent of Americans who live in Frontier America.

2. Definition of Frontier

Historical background

The debate about the American Frontier has been going on for more than a century. After the 1890 census, Frederick Jackson Turner wrote the historic treatise that declared the frontier dead - made obsolete by the settling of the West. Because the frontier had always been considered a north-south line dividing the country between settled and frontier, Turner felt that westward expansion and settlement had eliminated the line.

A century later, after the 1980 census, Land Use Professor - and honorary board member of the Frontier Education Center - Frank Popper began publishing a series of academic and news articles refuting Turner. Although the line was gone, Popper observed that huge tracts of the United States were still very sparsely populated and remote. His research demonstrates that more than half the land area of the United States is *still* frontier and that the number of frontier communities continues to grow.

People who live and work in the frontier know that the only commonalities are sparse population and a long distance to the city. Almost everything else about these communities reflects the unique nature of frontier. Much of the frontier is native reservations and trusts. Other large parts are under the control of the United States; military, forest service, national parks, bureau of land management, and other agencies. The geography is

as diverse as the people.

In the mid-1980's, the federal Community Health Center program decided to consider as frontier those counties with a population less than or equal to 6 persons per square mile located at considerable distance (greater than 60 minutes travel time) to a medical facility able to perform a caesarian section delivery or handle a patient having a cardiac arrest. These latter criteria were forgotten through the years and programs began to define frontier counties with only a single criteria - population density of ≤ 6 persons per square mile.

This was unfortunate because frontier advocates have always opposed a single number as a definition.

For nearly 20 years, frontier advocates have asked for the development of a designation that would be a matrix of population density, travel time in minutes and distance in miles.

Using Consensus to Develop a New Definition

In 1997, the Frontier Education Center convened a group of frontier providers and policy experts to develop a consensus definition of "frontier." The goal was a definition, which would be widely accepted and supported. Consensus was achieved in April of 1998. After six months of work, a definition based on a simple matrix of population density, distance, and travel time was established.

The following statements describe the points of consensus:

- States and communities must be consulted in developing a definition and designation.
- Demographic information about communities or populations (for example, poverty, population over 65, and health status) should be part of resource allocation methodology, not the basic definition.
- Population density could be as high as 20 persons per square mile if the area or community were located at a great distance or travel time from the closest significant service center or market. In some cases, density could be slightly greater based upon consideration of the justification provided by the state.
- Communities should be involved with determining their service area and the closest market, whether or not located in the same state.

Using the consensus definition matrix (see Appendix), there are fewer than nine million people (less than 4% of the population) living in the frontier but they are spread over more than half the land area of the United States.

Testing the Consensus Definition

The first step, in developing this inventory, was to engage the states in the determination of frontier counties. This was accomplished through consultation with State Offices of Rural Health.

Forty states had at least one county with a population density of 20 persons per square mile. Each of these states received a packet of information from the Frontier Education Center containing the matrix, several maps of their state and tables showing the possible frontier counties, locations of primary roads (usually interstate

highways in most states) and distance buffers to nearby large communities. This background information was to assist the state in determining which of their counties they considered frontier.

Because this was a new process and definition, staff and board members of the Frontier Education Center were available to discuss the conditions within and among the states to facilitate the process.

One state, Vermont, asked to be deleted from the list. Vermont had one county with low population density, but it was close to a larger community and not frontier. The other 39 states either accepted the list of counties we had prepared, added other counties to the list, and/or deleted counties. The 940 counties in the 39 states included in this geography comprise the "frontier."

Population Density Per Square Mile	Number of States With Counties In Each Category	Number of Counties In Each Category
0 - 12	37	670
12.1 - 16	28	140
16.1 - 20	30	130
Outlier Counties		
0 - 1	13	100
18 - 20	27	97

USA					
NUMBER OF USA COUNTIES	NUMBER OF FRONTIER COUNTIES	PERCENT FRONTIER COUNTIES	1990 POPULATION ALL COUNTIES	1990 POPULATION IN FRONTIER	PERCENT POPULATION IN FRONTIER
3140	940	30%	248,709,873	10,204,310	4%

Alaska, Hawaii, and the Trust Territories

The State of Alaska is proudly known as the Last Frontier, and indeed it is uniquely different from the continental United States and other frontier areas. Rural advocates often describe a rural continuum, which varies from almost suburban to sparsely populated frontier areas. Unlike the continental United States, the rural continuum in Alaska begins with frontier and continues to complete wilderness.

The Frontier Education Center concurs with the State of Alaska on how to best define Alaska.

Recommendation: Support use of "Alaska" to designate special consideration for this state in federal law.

Rationale: Alaska is non-contiguous, has geographically isolated populations dependent on transportation via air and water, and has high medical costs.

SOURCE: Defining Rural, Frontier, and Alaska, Alaska Department of Health and Social Services, 1999.

Congressional language frequently partners Alaska and Hawaii as extreme outliers. Most recently this pairing occurred in the Senate Appropriations Committee Report 106-166 of September 1999.

The Committee is concerned that regulations and application procedures currently governing distribution of community health center funds are preventing remote rural states like Alaska and Hawaii from applying for and receiving funding for health centers despite severe shortages of health professionals and great need.

SOURCE: U.S. Senate, Appropriations Committee Report, 106-166.

This same report links Alaska and Hawaii again in the discussion of the Health Professions Shortage Area designation:

The Committee urges HRSA to consult with "frontier states" such as Alaska and Hawaii as part of its process of reconsidering this methodology to ensure that its final regulation meets the needs of frontier communities as well as rural ones.

SOURCE: U.S. Senate, Appropriations Committee Report, 106-166.

The Frontier Education Center supports the designation of Alaska, Hawaii and the Trust Territories as unique categories unto themselves.

Hawaii did not meet the population density criteria of frontier as developed in the consensus definition. However, the Center has had discussions with the Hawaii Office of Rural Health and supports special consideration for Hawaii, as well as Alaska. The Center recommends including the Trust Territories in a special consideration category as well, not subject to the usual federal designation processes.

3. Process of Gathering Frontier Data

The amount of data available is increasing rapidly, due to changes in technology and the ability to generate and store data. This has changed the challenge from gathering data to the analysis of data as well as assessing the quality of the data.

The identification and gathering of data was both time consuming and frustrating. Likely data sources were easy to identify but actually receiving the data was difficult, frequently taking numerous phone calls and months of waiting. The data that was collected came from both private and public sources.

Data Sources

- Internet Data

Data easily available and able to be downloaded from the Internet were gathered first. Examples of these data are public lands, Indian reservations and trust lands, and USDA information on rural economies.

Of all the data gathered, the most accurate is probably that which describes the extent of public, tribal, and trust land ownership and control. This is information which does not change often and each is located within a physical boundary.

- Public Agency Data

Information about federally designated and/or funded facilities was received from the Bureau of Primary Health Care (BPHC) and the Health Care Financing Administration (HCFA). These included Community Health Centers, Rural Health Clinics, National Health Service Corps Sites, and Indian Health Service Facilities.

Public agency data is accurate as of the date it was provided. It provides a snapshot of a particular point in time.

Information about federally-funded community mental health centers was provided by the Center for Mental Health Services, SAMHSA, DHHS.

- Information from Trade Associations

Many associations were contacted with a request to provide data to this project. Several shared all or some of their data at no charge. For example the National Association of County and City Health Officials (NACCHO) provided information on local public health agencies. The American Hospital Association (AHA) provided the information on military hospitals at no charge but requested \$2200 for their database of all US hospitals. Other organizations would not release their data or wanted to be paid for the information.

- Private Sector Data

We tested a database called Business Analyst (Copyright) developed by Dun and Bradstreet, Inc. which was compatible with the ArcView software we were using but found it too inaccurate for the purpose of this inventory. ESRI, the corporation that produces ArcView, directed us to a company in Clearwater, Florida called infoUSA for a more accurate database of health resources.

The data from infoUSA is advertised to be the most complete database on health services. In order to test the data before purchase, the database for New Mexico was evaluated. New Mexico was chosen because of staff familiarity with the health care system in New Mexico. While not perfect, infoUSA data was more complete than any of the other data sources generally available.

The *caveat* with infoUSA data is that even though they collect information reported on business licenses or registrations from the states, the states do not assure the accuracy of the data. Licensure requirements differ among the states so that the data is different from state to state. Businesses self-report and self-select a Standard Industrial Code number when they apply for a license. This information is then collected and categorized by infoUSA.

The following table contains the SIC numbers purchased from infoUSA.

SIC	DESCRIPTION
8011-01	Physicians-family, general, internal, pediatric and osteopaths
8011-04	Clinics-medical and emergency
8062-02	Hospitals
8049-07	Nurse Practitioners
8049-20	Physician Assistants
8062-03	Emergency Medical Services
4119-06	Rescue Squads
8322-59	Health Care Instruction
8082-01	Home Health Service
8099-36	Health Education
4119-12	Medical Transportation

8063-01	Mental Health Services
8093-05	Mental Health Clinics
4522-02	Air Ambulance Service
4119-02	Ambulance Service
8399-27	Substance Abuse Centers
8399-02	Alcoholism Information and Treatment
8399-24	Chemical Dependency Treatment Centers
8399-05	Disability Services
8399-01	Drug Abuse and Addiction Information and Treatment
8049-11	Occupational Therapists

4. Health Resources in the Frontier

Health resources in the frontier differ greatly from state to state. These differences extend even to programs funded by the federal government.

We learned that health services are lacking in most frontier counties. The majority of counties have two or fewer services of any type and the preliminary data indicates that there may be no health services in as many as 78 counties in 21 states. The number of people living in these counties and affected by the lack of services may total **a quarter of a million people living in counties with no health services**. Most of these counties are very large Western counties where the travel time and distances to care are significant.

The demographics of these counties need immediate study. A needs assessment should be conducted to quickly develop recommendations for the provision of the minimally appropriate services to the population. There is an average of 2702 people living in each of these counties, if the population were equally distributed among them.

All of the other frontier counties are lacking in services. It is a rare frontier county which has an acceptable number of services. An ideal frontier community health care system will include all or at least combinations of the following services: primary care, public health, dental care, mental health and substance abuse programs, skilled nursing for elderly and disabled, EMS, health education, and school-based programs. No services is not acceptable any longer.

5. Land Ownership in the Frontier

The federal government, and to a lesser degree the states, has special obligations for the development and maintenance of the infrastructure of frontier communities. Small population makes it difficult for communities to provide their own basic infrastructure.

The obligation on the federal government in twelve western, frontier states is very great. The federal government owns from 27% of the land in these states (Montana 27.3 %) to almost 80% of the land in Nevada. The small amount of land available for private ownership - and taxation - is reduced even further when the land owned by both the states and other units of government as well as the federally-recognized Indian tribes and held in trust is added to the public lands owned by the federal government. It is appropriate to think of these states as "frontier" in their entirety.

<u>State Percentage of Federal Land</u>	
Montana	27.3%
Washington	28.0%
New Mexico	33.7%
Colorado	36.3%
Arizona	43.1%
California	44.7%
Alaska	47.0%
Wyoming	49.5%
Oregon	51.6%

Idaho	62.3%
Utah	64.3%
Nevada	79.8%

SOURCE: U.S. General Services Administration, 1999

This non-private land ownership creates a permanent barrier to private sector infrastructure development. Even if extensive economic development were to occur on the private land, there is a finite limit imposed by the amount of non-private land.

It is appropriate for the federal, state, local governments and tribes to maintain and even increase their land holdings. National needs for natural resources, wildlife and watershed preservation, historic preservation and open space require that large amounts of land be preserved.

6. The Frontier Economy: The Relationship between Economic Development and Health Care in Frontier Areas of the United States

While the population of frontier America is very small compared with urban and even rural areas of the country, frontier regions are critically important to the economic health of the country. Frontier counties are the home of the majority of agricultural activity in this country, and many of our natural resources, for example timber, grazing lands, and minerals, are abundant in the frontier areas. In addition, most of our national parks, forests, and Indian reservations are located in frontier counties (National Rural Health Association, 1994). The strength of the local economies in these areas impacts the economy of the nation. And the strength of the local economy is interconnected with the health status and access to health care resources for people living in the frontier.

While there has been considerable research done on the rural economy and rural health care issues, there has been limited research specific to economic conditions and the relationship to health care in the frontier. While much of the research in rural areas can be applied to the frontier, there are some significant differences. This report utilizes the rural research and attempts to interpret the findings in a manner relevant to the frontier areas of the United States. More frontier-specific research is needed if we are to find ways to create and maintain sustainability in these vitally important areas of our country.

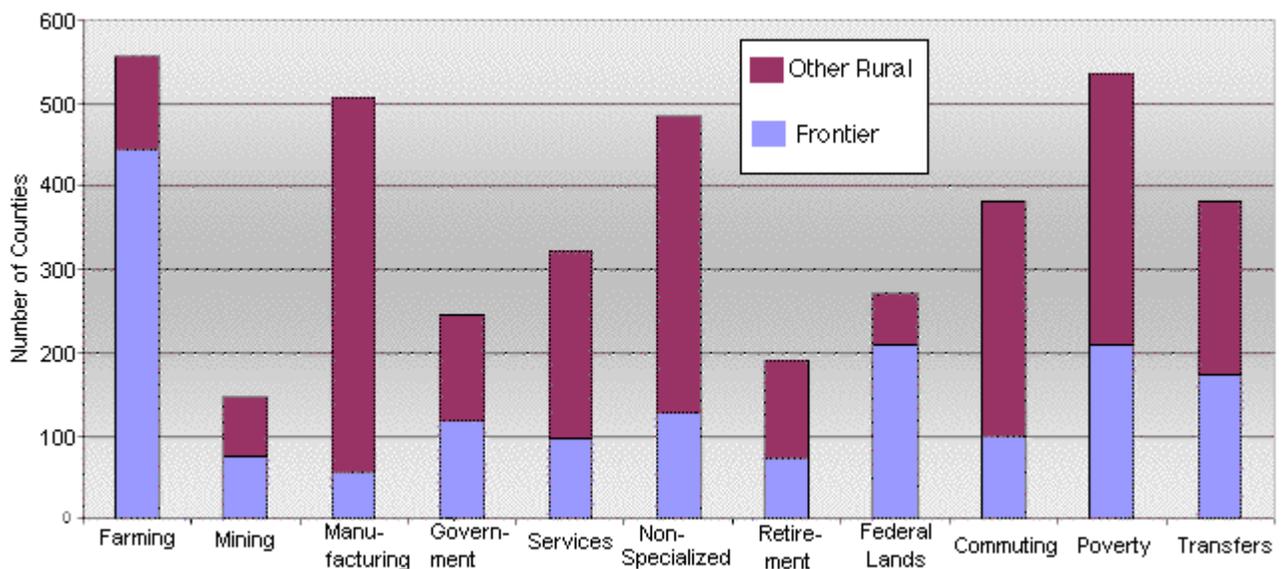
FRONTIER ECONOMY

There has been a significant decline in the traditional rural occupations based on natural resources—farming, forestry, fishing, and mining. In 1940 these occupations employed 40% of rural workers, while in 1980 they

employed fewer than 10% (Bluestone and Daberkow, 1990). Rural areas are experiencing economic restructuring, moving away from resource-based industry towards more service-based economies. This economic restructuring affects the frontier to varying degrees.

While we talk of "the frontier," it is impossible to analyze the relationship between economics and health care in the frontier without recognizing the diversity of frontier America. This diversity manifests in the geography of the land, the sociodemographic characteristics of the population (De la Torre and Luft, 1986), the history and culture, and the economic fabric of various frontier regions. The U.S. Department of Agriculture has created a typology to classify nonmetropolitan counties based on their economic dependencies and other policy-relevant characteristics (Cook and Mizer, 1994). Applying this typology to the frontier counties can provide a framework for understanding the heterogeneity of the frontier. The typology provides six mutually exclusive categories related to economic dependency and five overlapping categories related to policy-relevant characteristics. The five economic dependencies are: farming-dependent; mining-dependent; manufacturing-dependent; government-dependent; services-dependent; and non-specialized. The policy-relevant characteristics are: retirement destinations, regions with a high proportion of federal lands; areas in which residents commute to work; persistent poverty areas; and transfers-dependent areas. Chart 1 depicts the ERS typology categories for rural and frontier counties.

Chart 1: USDA Economic Typology for Rural and Frontier Counties



Economic Types in the Frontier: Mutually Exclusive Categories

Brief descriptions for the six mutually exclusive categories follow. Chart 2 depicts the distribution of these categories among frontier and all rural counties.

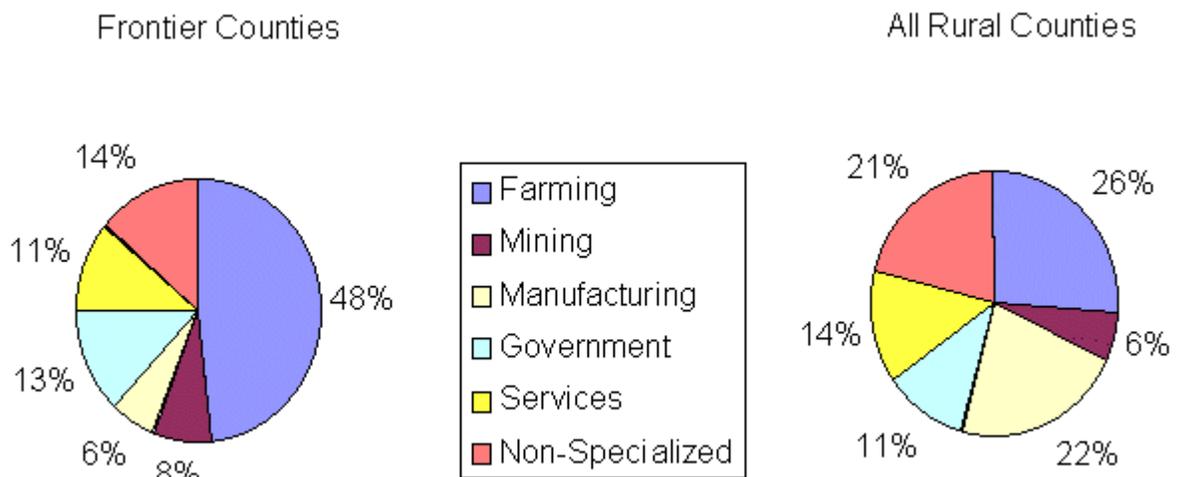
Farming dependent

These counties derive 20% or more of their earned income from farming and are concentrated in the Great Plains. There has been a drastic decrease in farm-related income, due in large part to the "success" of the farming industry: increased productivity and efficiency have naturally lead to a decrease in farm employment. In spite of the overall decrease in farming employment, agricultural activity remains concentrated in the frontier. While farming-dependent counties account for only 24% of nonmetropolitan ("rural") counties, 48% of frontier counties qualify as farming-dependent. In addition, farming-dependent counties are disproportionately concentrated in the frontier--while frontier counties account for 41% of all nonmetro counties, 80% of nonmetro farming-dependent counties are frontier counties.

Economic growth and restructuring is coming more slowly to these counties than to the other rural counties (Johnson and Beale, 1998). While there appears to be "rural renaissance", fueled by population growth and a shift to a more services-oriented economy, the Great Plains has not shared in this revival. During the 1980's, 80% of farming-dependent counties lost population; the average outmigration was 11%--twice that of all nonmetro counties. The population loss tended to be primarily the working-age population, leaving less working people to support a greater proportion of those not working--the elderly and the young (United States Department of Agriculture, 1995).

Decline in farming-related income coupled with the relative lack of economic diversification and restructuring has exacerbated the inherent difficulties in providing services such as health care to the population. Decreases in population density serve to increase the cost per capita of services, and decreases in per capita income make it that much more difficult to pay these increased costs.

Chart 2: Economic Typology for Frontier and All Rural Counties, Mutually Exclusive Categories



Those counties classified as mining-dependent derive 15% or more of their earned income from mining activities. Eight percent of frontier counties fall into this classification, and mining-dependent counties are

slightly more concentrated in the frontier than in nonmetro America overall-51% of nonmetro mining-dependent counties are frontier counties compared with the 41% of nonmetro counties that are frontier. As with farming, mining-dependent counties saw a drop in both population and per capita income during the first half of the 1980's (Cromartie and Wardell, 1999; Johnson and Beale, 1998).

Manufacturing Dependent

Manufacturing-dependent counties derive 30% or more of their earned income from manufacturing, and are concentrated in the eastern half of the nation. These counties are disproportionately under-represented in the frontier, with only 11% of all nonmetro manufacturing counties being frontier counties compared with the 41% of nonmetro counties that are classified as frontier. Overall, only 6% of frontier counties qualifying as manufacturing-dependent compared to 22% of all non-metro counties. Although there are slightly more farming counties than manufacturing counties nationwide (24% of all rural counties compared with 22%, respectively) rural manufacturing employs nearly twice as many people as does farming. This employment is concentrated outside of the frontier and the predominance of farming over manufacturing for frontier counties is probably one the primary characteristics that divides the frontier from the rest of rural America.

Government Dependent

Government-dependent counties derive 30% or more of their earned income from government employment. These counties have slightly higher proportionate representation in the frontier than in nonmetro counties overall, with 48% of all government-dependent counties being frontier counties, compared with the 41% of nonmetro counties that are frontier. This is probably partially due to the much higher proportion of federal land (see below) in the frontier. Of all frontier counties, 13% qualify as government-dependent. The government sector often brings with it services and amenities not available to other economies in the remote frontier areas. It would be useful to further analyze this category to determine the impact of military-related income on these counties.

Services Dependent

Services-dependent counties derive 50% or more of their earned income from services-related jobs. The frontier has proportionately less services-dependent counties than all of nonmetro America-30% of nonmetro services-dependent counties are in the frontier compared with the 41% of nonmetro counties that are classified as frontier. Altogether, 11% of frontier counties are services-dependent.

In the frontier, there are predominantly two types of service economies. Services counties in the Great Plains tend to act as regional trade center for the surrounding rural communities that don't have a large urban area close by. Services counties near natural amenities tend to provide services to meet the needs of tourism, recreation, and retirement populations. The former type of services county is in danger of economic decline due to the overall economic decline of the Great Plains. On the other hand, services counties meeting tourist, recreation or retirement needs are showing economic and population increases due to the increase in these economic activities.

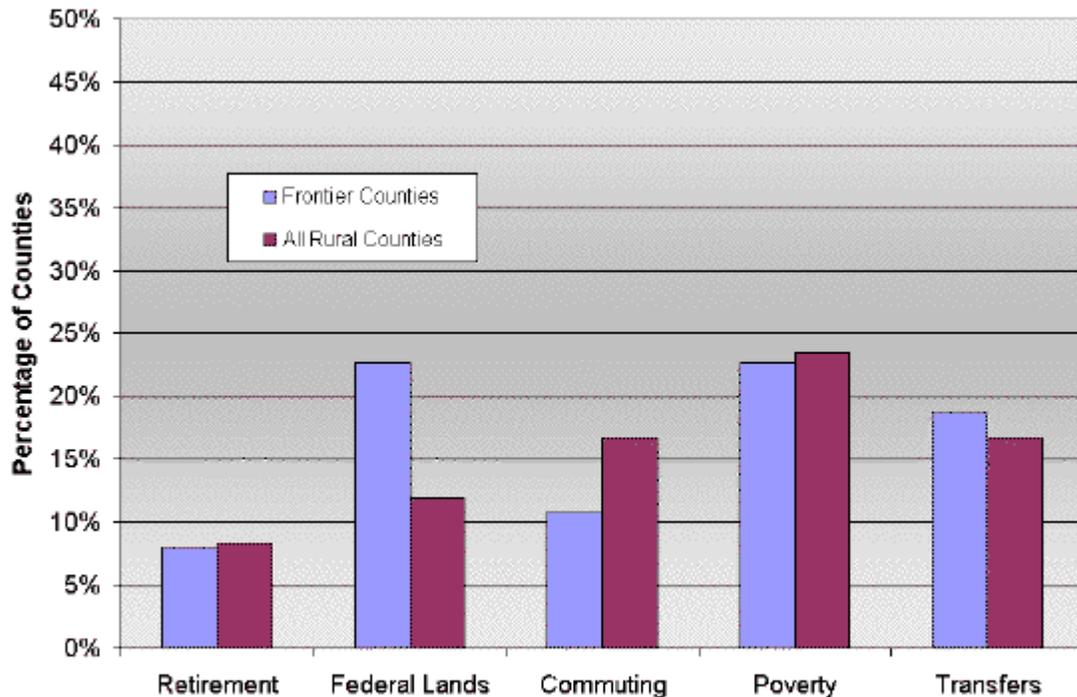
Non-Specialized

These counties do not fall into any category above. These counties are under-represented in the frontier, with only 26% of all nonmetro manufacturing counties being frontier counties compared with the 41% of nonmetro counties that are classified as frontier. Overall, only 14% of frontier counties qualifying as manufacturing-dependent compared to 21% of all non-metro counties. This speaks to the lack of economic diversification in frontier communities, and the fragility of single-industry and resource-extraction dependent economies.

Economic Types in the Frontier: Non-Mutually Exclusive Categories

Brief descriptions for the five non-exclusive categories follow. Chart 3 depicts the distribution of these categories among frontier and all rural counties.

Chart 3: Economic Typology for Rural and Frontier Counties,



Non-Exclusive Categories

Retirement Destination

Retirement destination counties are those that experienced 15% or more immigration of people age 60 or older during the 1980s. These counties are concentrated in the South and West and are distributed proportionately

between the frontier and the remainder of nonmetro counties. Of all rural retirement counties, 39% are in the frontier, compared with 41% of nonmetro counties that are classified as frontier. A total of eight percent of all frontier counties are retirement destinations.

The growth in retirement populations tends to bring with it a growth in services, thus sparking population growth among younger age groups. However, supply does not always keep up with demand, and the growing demand for infrastructure and social services can pose challenges for these communities.

Federal Lands

Federal lands counties are those counties, located primarily in the West, in which 30% or more of the land is owned by the federal government. The frontier has a disproportionately high representation of these counties compared with all of rural America-77% of all nonmetro federal lands counties are in the frontier compared with the 41% of nonmetro counties that are classified as frontier. Of all frontier counties, 23% are federal lands counties. Population density in these counties tends to be distributed differently than in farming dependent counties-populations tend to cluster rather than being spread thinly and evenly.

Job growth and population growth in these counties has been higher than for other nonmetro areas. This is connected to the growth of the service industry related to increases in tourism and recreation in these areas. Similar to the retirement destination communities, this growth is double-edged, with the supply not always keeping up with increased demand. As with the government-dependent category above, it would be useful to determine what percentage of frontier "federal lands" are military related.

Commuting

Within commuting counties, 40% or more of the workers age 16 or older commuted outside their county of residence for employment. These counties are under-represented among rural counties, with 26% of nonmetro commuting counties being frontier counties compared with the 41% of nonmetro counties that are classified as frontier. A total of 11% of frontier counties are commuting counties, compared with 17% of all nonmetro counties.

The lower rate of commuting counties speaks to the geographic isolation of frontier counties as well as the lack of economic diversity within the populations of these counties. Less commuting for work means that residents do not have a reason to travel outside of their area on a regular basis, making access to services not within their community more of a challenge.

Persistent Poverty

Persistent poverty counties had 20% or more of their population living below poverty in 1960, 1970, 1980 and 1990, and are concentrated in the Southeast, Appalachia, the Southwest and on American Indian and Alaska Native Reservations and trust lands in the North and West. Persistent poverty counties are distributed proportionately between the frontier and the remainder of nonmetro counties. Of all rural poverty counties, 39% are in the frontier, compared with 41% of nonmetro counties that are classified as frontier. A total of 23%

percent of all frontier counties are persistent poverty counties.

Lack of access to economic opportunity in the frontier is one cause of poverty, but not the singular cause. These counties have, on average, large numbers of female-headed households, and large numbers of people without a high school education (Beaulieu and Berry, 1994). And, just as poverty limits access to services such as health care, nutrition, and education, limited access to these services further entrenches poverty.

Transfers Dependent

These counties had income from transfer payments (federal, state, and local) that contributed a weighted annual average of 25% or more of total personal income. Transfers-dependent counties are distributed proportionately between the frontier and the remainder of nonmetro counties. Of all rural transfers-dependent counties, 45% are in the frontier, compared with 41% of nonmetro counties that are classified as frontier. A total of 19% of all frontier counties are transfers-dependent.

These counties are especially susceptible to policies governing the distribution of government transfers.

Boom or Bust in the Frontier

For the most part, the frontier population is faced with the challenges and uncertainties of a very fragile economy. Frontier regions tend to be overly dependent on a single economic base. The inevitable economic fluctuations can be disastrous for these regions. For example, the farm crisis of the eighties caused great economic hardship for many frontier communities, including mass outmigration and a rapid rise in the underclass. Similarly, at the local level frontier communities are often dependent on one or two major employers, with the risk of economic devastation should those employers relocate.

The primary economies of the frontier-farming/ranching, mining, forestry, and oil and gas extraction-tend to be more prone to boom or bust cycles than other industries. Other common frontier occupations are cyclical by nature, with a predictable high and low season, for example tourism, recreation, and migrant farming. The larger, less predictable economic cycles as well as the predictable seasonal cycles create challenges for both the provision of even basic services in these areas as well as the sustainability of these communities without external financial support.

At the more macro-level, the frontier has both areas of economic growth and economic stagnation or decline, as demonstrated in county typology, above. The more service-oriented counties of the west and southwest are seeing growth due to tourism, retirement, and recreation, while farming-dependent counties in the Great Plains and the Mississippi Delta are experiencing decline.

ECONOMICS AND HEALTH STATUS

The impact of the economy on health status

As with other data, health statistics specific to the frontier are limited. The data clearly indicates, however, that

rural residents are less healthy than those residing in urban areas. The factors contributing to the poorer health of rural residents-lack of access to resources, poverty, slightly larger elderly population, and rural lifestyle factors-are equally pervasive and often more pervasive in frontier areas. Studies in Utah and South Dakota document higher morbidity and mortality in the frontier areas of those states than in the more densely populated rural areas (Osberg, 1987). It would be safe to assume that frontier residents do not fare any better, and probably are worse off in many ways, than their rural counterparts. The health status of the frontier population is closely connected with the economic characteristics and conditions of frontier areas.

Occupational Hazards

Farming, mining, and forestry-all predominantly frontier-based, are among the most hazardous occupations. Rural residents are more often disabled and diagnosed with more severe occupation-related illnesses than urban residents (Center for Health Policy, 1999). Farmers exhibit high rates of respiratory disease, noise-induced hearing loss, skin disease, certain cancers, chemical toxicity, and heat-related illness (National Rural Health Association, 1994). Additionally, because emergency and other health resources are less available in frontier communities, health outcomes for occupational accidents are worse than in areas with better resources.

Poverty

Poverty is related to lower health status due to a number of factors. Access to health care, tendency to utilize preventative care, and likelihood of having health insurance are all diminished for those persons living in poverty. Additionally, poor nutrition, sub-standard housing, and life stress associated with poverty have a negative impact on health status. A study of farming economies and psychological depression indicated that depression is highly correlated with economic stress (National Mental Health Association, 1988).

Lack of Insurance

In rural America, more people lack health insurance than in urban areas (20% fewer). The causes of this include a higher percentage of people who are self-employed, who work for small businesses, who do seasonal work, who are unemployed, or who fail to apply for Medicaid. Rural occupations-for example agriculture, mining, fishing, forestry-are often seasonal and are less likely to provide health insurance to employees.

The effects of this lack of insurance include people receiving less preventive care and less appropriate care for acute and chronic conditions (e.g. inappropriate emergency room care), resulting in decreased health status. In addition, in rural areas there is not the same safety net of free or subsidized care for those who cannot pay as in urban areas, and providers cannot so easily turn away the uninsured to seek care elsewhere. Thus, economic viability for health care providers is threatened.

Lack of health care resources

Residents in frontier areas have less access to health care resources than do residents in more densely populated areas. The number of physicians practicing in urban areas was more than twice as high as in rural areas in 1988. Furthermore, frontier counties have fewer than one half as many primary care physicians and approximately one

ninth as many nonprimary care physicians per capita as the larger rural counties (United States Congress, 1990). In 1988, 176 counties had no primary care physician, and all of these counties were the lower density counties (less than 25,000 residents) (Ricketts, 1990). As the population of certain frontier areas decreases, provider supply in these areas is likely to decrease as well. Studies have indicated that the least populated counties, and those counties with the worst physician-to-population ratio were least likely to have increases in provider supply (United States Congress, 1990).

A shortage of health care resources leads to a lack of preventative care, exacerbation of acute conditions, and an increase in chronic health problems. People are more likely to use inappropriate care, because it is all that is available, or because conditions have progressed to a point where emergency care becomes necessary.

The effect of health status on the economy

Increased population health is correlated with a healthier economy. Healthy workers are more productive, incur less work time lost to health reasons, and contribute more productive years of work to the labor force.

ECONOMICS AND HEALTHCARE RESOURCES

The relationship between the economic situation in the frontier and health care resources is two sided: economic conditions impact the availability of health care resources and existing and potential health care resources impact the strength of the economy.

The Effect of Economic Conditions and Characteristics on Health Care Resources

The economic characteristics of low-density counties contribute to a shortage of health care providers. While provider shortages are not due entirely to economic characteristics, the primary reasons can be traced directly and indirectly to economic causes. It is difficult for health care providers to set up a viable practice in a community with very few residents; disproportionate poverty in some frontier areas makes provider reimbursement questionable; and health care professionals lack professional support and can feel personally and professionally isolated working in these remote areas.

Recruiting providers to remote areas is a major problem. There is an overall trend towards specialization for physicians, creating less availability of general practice providers overall. It is rarely viable for specialists to locate in remote areas and for the existing general practitioners frontier areas are frequently unappealing. Aside from the issue of professional isolation, it is more economically difficult to maintain a practice in remote areas. Economies of scale create a higher per capita cost of service, and reimbursement in rural and frontier areas is, on average, lower than in urban areas. A higher percentage of rural health care payments come from Medicaid and Medicare, which compensate at a lower rate than private insurers (National Rural Health Association, 1998). Rural and frontier residents are more likely to be uninsured than their urban counterparts, increasing the amount of uncompensated care.

As populations decrease in many frontier areas, and economies stagnate or decline, the future of rural hospitals

is jeopardized. While existing hospitals are often critical to a community both medically and economically, it is very difficult for the rural economy to support health care, and hospitals are suffering (United States Congress, 1990).

The boom or bust tendencies of the frontier create special problems for the delivery of health care. Job security is an issue for health care providers in an economy that is volatile. Likewise, on-going support for healthcare facilities becomes problematic in an economy that fluctuates. Seasonal employment creates varied demand, both in terms of quantity and type. For example, seasonal tourism can create the need for more acute care during peak season, with substantially reduced demand at other times.

The Impact of the Health Care Sector on the Economy

Health care delivery, or lack thereof, has an important economic impact on rural and frontier communities. A review of the economic impact is broken down into 1) the circulation of local economic resources, 2) bringing outside resources into the community, and 3) the enhancement of local economic development leadership.

The Circulation of Local Economic Resources

Rural and frontier residents tend to travel outside of their communities to meet their health care needs. There are two causal factors in this: 1) a lack of health care resources in the local community and 2) the perception that better services are available elsewhere. These two factors are related. As individuals leave the community to seek care outside, it becomes more difficult to support local health care services, which diminishes the available resources, which causes people to seek outside care. This tendency to leave the community, even when local care is available, is more common among the younger, more educated population. This population also tends to be more able to pay for care, leaving less per capita resources available to pay for local health care delivery.

Taxes that fund Medicaid and Medicare, as well as health insurance premiums, are drained out of a local community. These funds can be returned to the community, and even enhanced, if care is provided locally.

When health care is provided locally, the dollars spent on health care stay in the community, circulating to other sectors and, overall, strengthening the local economy. Additionally, supporting local health care services supports the economic viability of the community indirectly. Because of the multiplier effect, for every physician that is able to survive in a community, both health care-related and service-related jobs are created. The economic impact of a rural hospital has even greater potential. Studies indicate that the multiplier for the impact of a rural hospital on the local economy ranges between 1.2 and 2.3 (Christianson and Faulkner, 1982).

Bringing Outside Resources into the Community

Beyond the circulation of local resources, outside resources are brought into the community through the health care sector. Many frontier communities are tourist destinations. If health care services are available, tourist dollars will be captured. And, as stated above, Medicaid, Medicare, and insurance payments can bring in dollars in excess of what has been paid out.

Other ways in which outside resources are brought into the local community is through attraction of new businesses and residents, and the creation of investment funds. The availability of health care services is on the list of top factors new businesses consider when making a decision about locating to an area. This is true as well for individuals considering relocation. With the retirement population moving into more rural areas, this becomes especially important, in light of the special health care needs of the elderly.

Lastly, hospitals and other health care facilities can provide considerable funds for short-term investment when their financial resources are held in local financial institutions.

Enhancement of Local Economic Development Leadership

Frontier communities face economic challenges. Those that are declining need to develop growth opportunities as they move away from the traditional economic structures that no longer sustain them. Those communities that are experiencing economic expansion need to develop sustainable growth patterns that will continue to meet the needs of their growing populations. Health care professionals can expand the capacity of local economic development leadership. There is a vested interest in economic viability, and health care providers are usually connected with resources outside of the local community. The knowledge, experience, and economic investment of local health care professionals can be harnessed to develop sound economic growth strategies.

7. Projecting the Future

The Board of Directors of the Frontier Education Center has been initiating discussion among themselves and their colleagues in an effort to predict how Frontier America might change in the Year 2000 Census. Board member, Frank Popper, projects that the frontier will continue its a-historical eastward shift.

Originally the frontier was defined as a north-to-south line, beyond which to the west constituted an unsettled area or frontier. In the years between the 1980 and 1990 Census, the counties, which changed from rural to frontier, were primarily in the geographic heartland, the Great Plains from North Dakota to Texas. This trend will continue in the Year 2000 Census but in addition, several regions in the Deep South will also lose population and join Frontier America.

The importance of this shift in population is that with loss of population, loss of community resources and services also decline. These communities' needs to be identified and evaluated to make sure that appropriate services have been maintained even as population has fallen.

At the same time loss in population is occurring in some frontier areas, other frontier counties are learning to cope with rapidly increasing population and a change in status for them. It is important to assure that both types of frontier counties are supported through the changes.

Policy makers must also face the challenges of guaranteeing an adequate and accessible level of services. Health

care delivery has advanced too rapidly to leave frontier communities out of the advances. New technology and programs like the National Health Service Corps have improved access to care, but the coverage is uneven and inequitably distributed.

Frontier advocates would like to see the establishment of a federal definition, which is inclusive to outlier and transitional frontier communities. This definition would then be used as a basis for rational planning for the communities with the most fragile and unself-sustainable infrastructure.

RECOMMENDATIONS FOR FURTHER RESEARCH

- Conduct a needs assessment of the frontier counties which have no or inadequate services and develop an action plan for locating services in these critical need areas.
- Conduct new economic research on the frontier counties as a special subset of rural counties: census data, growth and contraction.
- Analyze economic conditions and trends in frontier areas using USDA typology.
- Monitor economic impact of alternative health care delivery structures in frontier areas.
- Develop policy and alternate health care delivery model recommendations based on differing economic conditions in the frontier areas.
- Develop recommendations for incorporating health care delivery into economic development strategies in frontier communities.
- Conduct detailed research on environmental justice issues specific to the frontier.
- Analyze the impact of the military on frontier economies.
- Develop new types of providers and facilities, which best meet the needs of frontier communities.

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