

Shortages of Rural Mental Health Professionals

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This study presents a conceptual model of the supply and demand for mental health professionals. It uses national data to profile differences in the supply of mental health professionals in different types of rural and urban areas. It contrasts the availability of general health and mental health professionals. It examines shortage areas identified in 2000 and their related community characteristics. Because of the absence of data on a national level to describe many types of mental health professionals state licensure data for one state were used to show the volume and distribution of these practitioners. To improve rural mental health service delivery it will be necessary to implement system changes to promote the increased availability, competency, and support of rural health professionals.
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THE AVAILABILITY OF providers to care for patients is the foundation for all health care delivery. Unfortunately, many areas in our country continue to have shortages of health care professionals. This is particularly true regarding mental health care. Although the current emphasis in improving care is focused on changing practice behaviors by incorporating evidence-based care, many communities are still struggling to find providers to deliver care. A prerequisite to the implementation of evidence-based care is the availability of providers.

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This article presents a conceptual framework for studying the supply and demand for rural mental health providers. This model combines an established framework of rural mental health service delivery with traditional economic supply and demand theories. A study of the availability of primary care and mental health professionals in different types of rural and urban areas is presented for the nation. Areas identified as having primary care and mental health shortages are described. Finally, a research agenda for rural mental health is discussed in relation to the need for overcoming the lack of providers in rural areas.

There are several criteria to designate shortage areas. These include designations for shortages of primary care physicians, mental health professionals, and dentists. Primary shortage areas generally have a full-time equivalent primary care physician ratio of 3,500:1, or, in high need areas, a ratio of 3,000:1. Birth rate, infant death rate, and poverty level determine high need (<http://bhpr.hrsa.gov.shortage/hpsacritpcm.htm>).

There are several different ratios for designating mental health professional shortage areas. These include a population to mental health professional ratio of 6,000:1 or a psychiatrist

ratio greater than or equal to 20,000:1. A description of the shortage area designations is available at <http://bphc.hrsa.gov/shortage>. The Health Resources and Services Administration Web site provides a list of the counties designated as health professional shortage areas (<http://bphc.hrsa.gov/databases/newhpsa/newhpsa.cfm>), and a list of medically underserved areas (<http://bphc.hrsa.gov/newmua.htm>). New criteria for shortage areas are being reviewed (<http://bhpr.hrsa.gov/shortage/faq.htm>)

Of importance are the reasons why different areas are designated as shortage areas. This is relevant because the designation serves as a basis for obtaining additional resources for communities as well as for planning recruitment, retention, and training interventions to communities with shortages. Shortage area designations are used by over 34 federal programs to determine eligibility for program participation or serves as a means for determining a "funding preference" (Bureau of Health Professions, 2002). For example, they are used by the Center for Medicare and Medicaid to identify providers eligible for additional incentive payments.

Because of the important uses of shortage area designations in the allocation of resources, it is important to determine if the current classification system meaningfully identifies communities with a lack of mental health professionals. A challenge to accurately determining shortages is the lack of data available on mental health professionals. The data is inconsistently available from state to state and from community to community. This makes comparisons difficult. To improve data describing professionals it is necessary to identify the important data elements for collection. These system improvements are best guided by identifying key data elements through the use of studies of currently available data using a conceptual framework to guide variable selection. This is different from the traditional approach to data collection that often has been generated through administrative planning. An integrated conceptual framework of rural mental health service delivery and supply and demand theory is presented in this article. Its purpose is to guide studies and data improvement efforts to overcome shortages of health professionals.

CONCEPTUAL FRAMEWORK

The Rural De Facto Mental Health Services Model (Fox, Merwin, & Blank, 1995) provides an overarching conceptual framework for study of the availability of mental health, primary care providers, registered nurses, and other types of providers within the complex rural mental health delivery system. This model describes the influence of the rural environment and the availability of insurance and of population characteristics on rural mental health care. These factors, together with the role of prevention, the identification of need for care, and the help seeking process influence the identification of mental health problems within the rural mental health delivery system. However, when problems are identified, service usage is then affected by intake processes in primary care, specialty mental health care, the justice system, social services, and/or alternative providers. Generally, the intake process leads to diagnosis and treatment. Ultimately, the quality of the services provided and the effectiveness of the system of care affect outcomes. See Fox, Merwin, and Blank, 1995 for a full description of the *Rural De Facto Mental Health Services Model*. This report includes a comprehensive review of the literature on all model components.

Outcomes of care are a result of the structure and processes of care (Donabedian, 1980,1992) and reflect all the input into care, such as the appropriateness of the treatment and the skill with which it was performed (Donabedian, 1992). The service usage component of the model is predicated on the availability of formal specialty mental health providers, primary care providers, other types of general health care providers, and informal providers of care. The optimal mix of specialty mental health and primary care providers and the substitution of different types of providers may influence the quality of the provision of mental health services in a community. It is important to consider both the availability of primary care providers and specialty mental health providers in studies of shortages of mental health providers because primary care providers fulfill important roles in the delivery of mental health care in rural areas. This article focuses on the supply and productivity of professionals. Traditional supply and demand theory from the field of economics has been used to provide additional insight into the

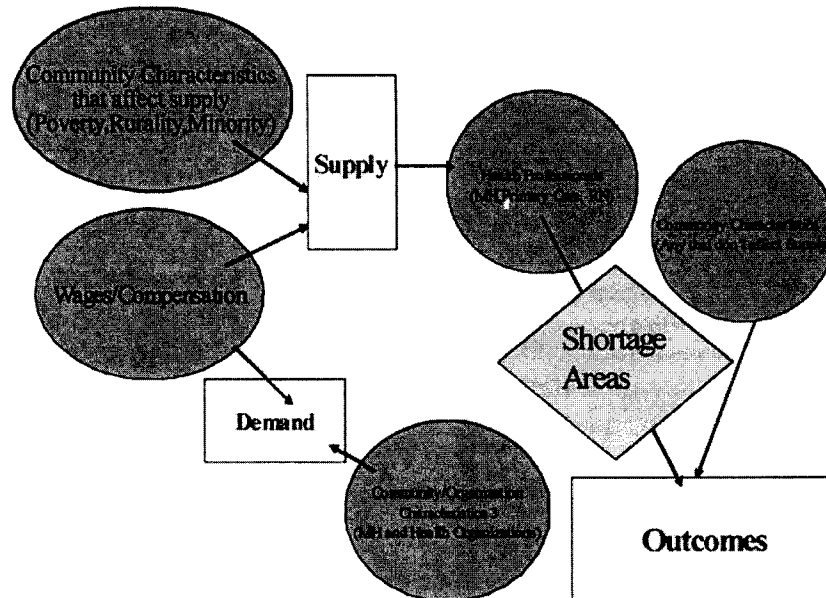


Fig 1. Model of supply and demand for mental health professionals and relationship with community/patient outcomes.

availability of health professionals within the rural mental health system. Production and use functions facilitate the understanding of the supply and demand of rural mental health providers. Figure 1 offers a schematic diagram of the relationships among the constructs important to understanding the supply and demand of rural mental health professionals.

The supply of mental health professionals is influenced by the characteristics of communities and by wages or compensation available to health professionals. Wages or compensation of professionals and organizational characteristics affect the demand for health professionals including staffing and skill-mix levels. Communities with high levels of poverty, in more rural areas, and with large minority populations are hypothesized based on prior studies to have lower numbers of specialty mental health providers. Many of these areas are likely to be classified as being health care shortage areas. Figure 1 indicates that shortages of health professionals may affect health outcomes and that there are two parts to modeling demand. The first is the production function that determines how health outcomes depend on the mix of available health professionals. The second is that there are exogenous variables not related to supply of health professionals that affect outcomes such as nutri-

tional or smoking habits. These are included in the model through community characteristics 2.

This model offers direction for the current study. The influence of community characteristics such as income, rurality, and minority composition of the population on the supply of general and mental health professionals are evaluated. The influence of these factors on the designation of a community being in a shortage area is determined.

STUDY DESIGN

This study uses the Area Resources File (2001) as a source of data. This dataset contains data from many different original data sources that are aggregated to the county level. The entire country serves as the population for the study. All counties in the country were used in these analyses. Their population characteristics, general health, and mental health professional availability and their designation as a primary care or mental health care shortage area is identified. Finally, models predicting the effect of county characteristics and the availability of professionals on shortage area designation are determined.

A more detailed focus on mental health professionals was conducted that included obtaining additional data not available on a national basis through a common dataset. Specifically, licensure

data was obtained for mental health professionals in Virginia for 1996 and again in 2000. The investigators obtained licensure data for all nonpsychiatrist mental health professionals in Virginia in 1996 and 2000. Additional data on psychiatrist availability was obtained from another source. A comparison was made to determine changes in the availability of different types of mental health professionals. Additional graphic analyses beyond what has been reported previously is included. Additional findings are reported and are available online: <http://www.vpca.com/>.

FINDINGS

National Perspective

The Area Resources File includes a record for each county in our country. Each county has been classified using the Department of Agriculture's Rural-Urban Continuum Codes according to their location in a metropolitan or nonmetropolitan area. The counties are further broken down into 10 groups, 4 types of metropolitan areas and 6 types of nonmetropolitan areas. Eighty counties were not classified because they are in Alaska or Puerto Rico. The population included the remaining 3,219 counties. Table 1 shows the number of counties of

each type. Most counties are nonmetropolitan, but the population is much greater on average in the metropolitan areas. There is also a higher percentage of minority populations in the most urban areas. The per capita income is not quite twice as much in the most urban areas compared with the most rural areas.

Table 2 presents the number of different types of providers per 10,000 census in the different types of rural and urban areas. This chart includes data from different original data sources. Because of a difference in how the data is included in the data file, the data on Virginia for registered nurses, psychologists, and social workers is not useable and Virginia data has not been used in the calculation of these variables. This table clearly documents the lower levels of availability of both primary care and mental health care professionals. Of note is the fact that registered nurses are the most plentiful providers in the rural areas. Also note the near absence of child psychiatrists outside of metropolitan areas, declining consistently from the more urban to the more rural areas.

Table 3 shows the percentage of counties of each type that are designated as primary care or mental health shortages areas. Shortage areas are

Table 1. Characteristics of Rural and Urban Counties in the United States

Rural-Urban Continuum Codes (Department of Agriculture)	Number of Counties	Census 2000	% Minority Population	Per Capita Income
Metropolitan areas				
0 Population, 1 Million+	176	724,482	26	30,814
1 Fringe Counties, to 1 Million+	132	87,846	11	24,333
2 250,000-1 Million Population	323	197,180	17	24,111
3 <250,000 Population	205	109,602	16	23,048
Counties in nonmetropolitan areas				
4 urban population 20,000+, adjacent to metropolitan area	138	76,100	16	22,112
5 urban population 20,000+, not adjacent to metropolitan area	116	61,641	19	21,668
6 urban population 2,500-19,999 adjacent to metropolitan area	618	29,305	16	19,639
7 Urban population 2,500-19,999, not adjacent to metropolitan area	653	21,011	15	20,050
8 rural (no places with population >2,500), adjacent to metropolitan area	247	11,633	15	18,773
9 rural (no places with population >2,500), not adjacent to metropolitan area	531	7,153	12	18,976

NOTE. Eighty areas are missing classification into rural urban continuum. These are in Puerto Rico and Alaska. Technical documentation with field numbers for the area resources file (February 2001 release) (p. 12).

Data from the Department of Agriculture, Bureau of Health Professions. (2001) National Center for Health Workforce Information Analysis.

Table 2. Mental Health Resources Available in Different Counties

Rural-Urban Continuum Codes (Department of Agriculture)	Medical Doctors (99)	Registered Nurses (90)	Psychiatrists (99)	Child Psychiatrists (99)	Psychologists (90)	Social Workers (90)
Metropolitan areas						
0 population, 1 million+	34	87	2	0.3	9	27
1 fringe counties, to 1 million+	9	66	0.3	0.07	4	19
2 250,000–1 million population	19	74	1	0.14	6	23
3 <250,000 population	22	78	1	0.15	6	25
Counties in nonmetropolitan areas						
4 Urban population 20,000+, adjacent to metropolitan area	15	63	1	0.05	5	24
5 Urban population 20,000+, not adjacent to metropolitan area	20	60	1	0.1	5.4	24
6 Urban population 2,500–19,999 adjacent to metropolitan area	8	51	0.25	0.03	3	20
7 Urban population 2,500–19,999, not adjacent to metropolitan area	10	48	0.3	0.03	3	21
8 Rural (no places with population >2,500), adjacent to metropolitan area	4	43	0.1	0.01	3	18
9 Rural (no places with population >2,500), not adjacent to metropolitan area	5	42	0.09	0.00	2	16

Data from the Department of Agriculture, Bureau of Health Professions. (2001) National Center for Health Workforce Information Analysis.

designated as whole county or partial county shortage areas. For primary care shortage areas there are more partial shortage areas (36%) compared with whole county shortage areas (27%). The opposite

is true for mental health shortages. Over half of the counties have whole county shortages but only 3.6% have partial shortage areas. Table 4 reports the influence of community characteristics on men-

Table 3. Percent of Counties Designated as Health Professional Shortage Areas, 2000

Rural-Urban Continuum Codes (Department of Agriculture)	N	% Whole County Shortage		% Partial County Shortage	
		Primary Care	Mental Health	Primary Care	Mental Health
Metropolitan areas					
0 population, 1 million+	176	0	1	55	16
1 fringe counties, to 1 million+	132	14	34	32	1
2 250,000–1 million population	323	11	21	57	7
3 <250,000 population	205	6	28	51	5
Counties in nonmetropolitan areas					
4 urban population 20,000+, adjacent to metro area	138	3	37	51	6
5 urban population 20,000+, not adjacent to metro area	116	7	55	52	5
6 urban population 2,500–19,999 adjacent to metro area	618	29	53	34	4
7 urban population 2,500–19,999, not adjacent to metro area	653	24	69	34	1
8 rural (no places with pop > 2,500), adjacent to metro area	247	58	57	23	2
9 rural (no places with pop >2,500), not adjacent to metro area	531	54	76	17	0
Total	3,219	860	1,635	1,154	117
%	100%	27%	51%	36%	3.6%

Data from the Department of Agriculture, Bureau of Health Professions. (2001) National Center for Health Workforce Information Analysis.

Table 4. Influence of Community Characteristics and Different Types of General and Mental Health Providers on Shortage Area Designation

Explanatory Variables	Mental Health Shortage (Whole or Partial) Odds Ratio/Parameter Estimates
Rural-Urban Continuum Codes(Department of Agriculture)	
Metropolitan areas	
0 population, 1 million+	-
1 fringe counties, to 1 million+	1.2
2 250,000-1 million population	.9
3 <250,000 population	1.1
Counties in nonmetropolitan areas	
4 Urban population 20,000+, adjacent to metro area	1.5
5 urban population 20,000+, not adjacent to metro, area	3.2*
6 Urban population 2,500-19,999	2.1*
7 Urban population 2,500-19,999, not adjacent to metro area	4.0*
8 Rural (no places with pop > 2,500), adjacent to metro area	1.9*
9 Rural (no places with pop >2,500), not adjacent to metro area	4.7*
% Minority	-0.00001
Per capita income	-0.00009*
Psychiatrists rate	-0.1239
Child psychiatrists rate	-0.3277

*Significant at the 0.05 level or lower.

tal health shortage area designation. The percentage of minority population was not important in explaining mental health shortage designation; higher per capita income counties were less likely to be so designated. This table shows that the most rural areas were 4.7 times more likely to be designated as having a mental

health shortage as compared with the most urban areas. In fact the 5 most rural types of counties were all between 2 and 5 times as likely to be designated as having a shortage. Figure 2 presents a map of mental health shortage areas as of 2000 using data from the Area Resources File. This map shows the large proportion of our

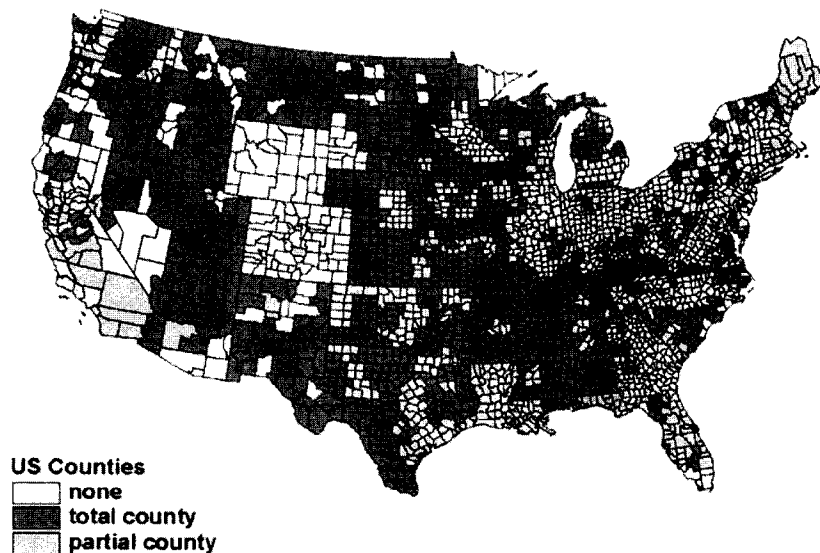


Fig 2. Mental health professional shortage areas, 2000. (Southeastern Rural Mental Health Research Center University of Virginia, October, 2002). U.S. Counties: □, none; ■, total county; ▒, partial county. Data from Area Resources File, February 2001; Original Data Source: HRSA.

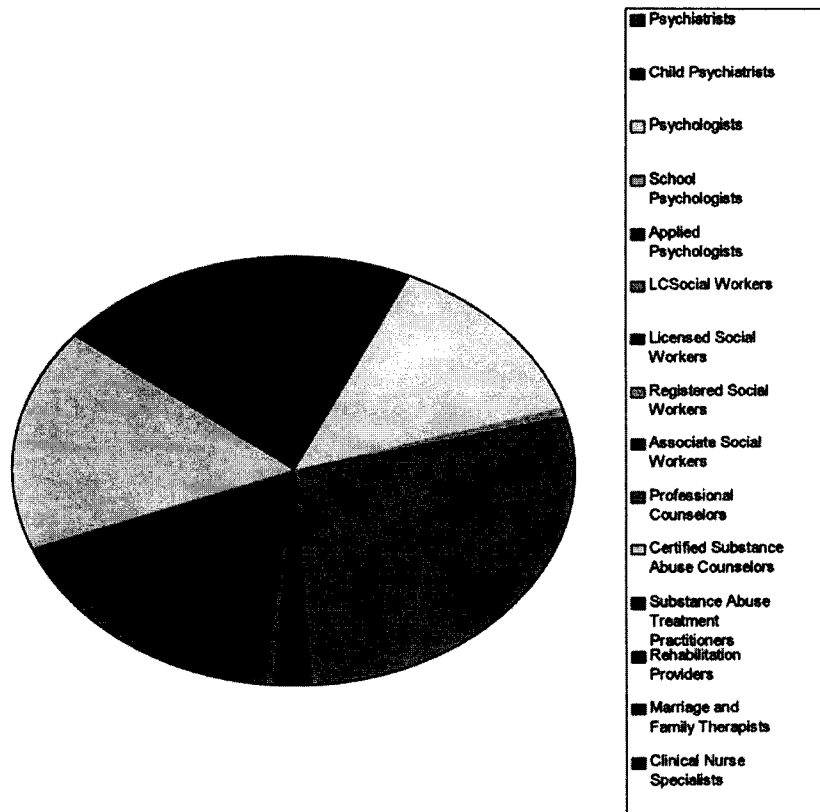


Fig 3. Mental health professionals in Virginia. Data from 2001 Virginia Department of Health Professions and 2001 Area Resources File and Merwin et al. (2002). Note some categories of professionals such as social workers and clinical nurse specialists includes providers who work in mental health and nonmental health areas. It is not possible to identify individuals's focus of practice from.

country in which shortages exist showing the importance of this policy issue.

It is hard to fully evaluate the accuracy of these shortage designations because of limited information on the availability of most mental health professionals in national datasets. Indeed the current definitions are applied using available data that often is inadequate. Although there is good data available on the counts of psychiatrists through the American Medical Association's master file, counts on other professionals often are limited. For example, the different mental health professional groups often use membership databases or databases developed based on probability sampling in determining counts to draw a national picture of the availability of these professionals; further there is a need for standardization in the measurement of the different variables (Peterson et al., 1998; Pion, Merwin, & Human Resources Data Group, 1998). The lack of data on nonmembers and small sample

sizes of datasets collected through probability sampling limit the ability to determine the number of providers in geographic areas smaller than the state. This is particularly problematic in rural areas where there are few providers. These areas are not likely to be adequately represented in the datasets. To overcome this problem the investigators obtained licensure data to determine the rates of availability of different types of providers.

State Level Perspective

All potentially relevant categories of licensed providers in Virginia for 2000 were identified from the State of Virginia's main licensure database for health professionals. The number of psychiatrists was obtained from an additional source. It is a subjective decision when determining whether or not to include a particular professional group. Some of the groups such as clinical nurse specialists contain both mental health and non-mental

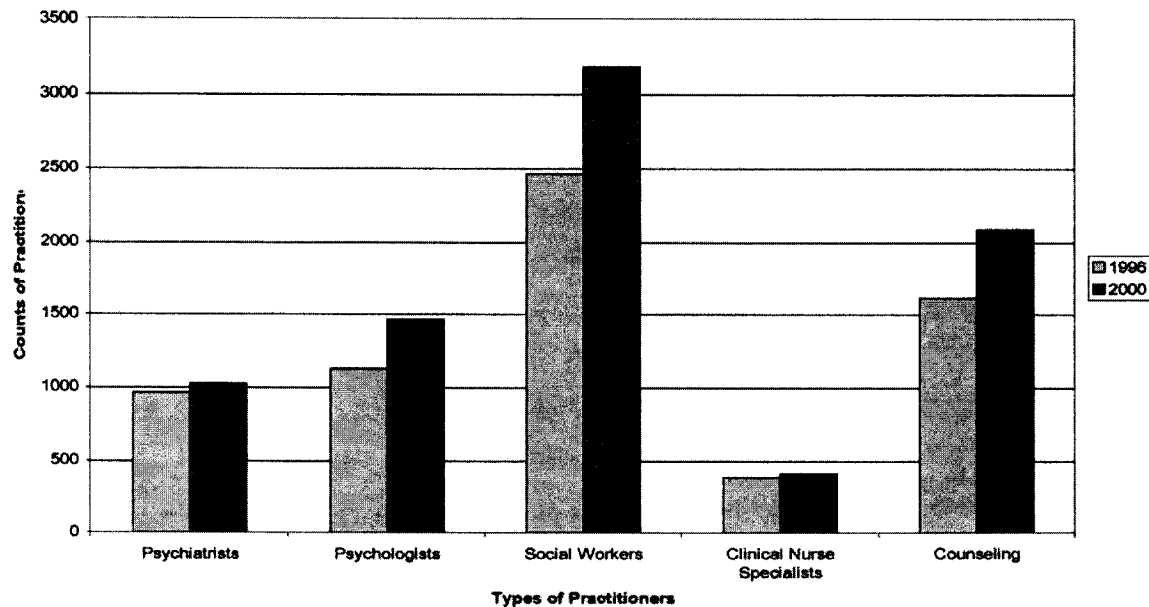


Fig 4. Changes in availability of mental health professionals in Virginia, 1996–2000. ■, 1996; ■, 2000. Note: Clinical nurse specialists include mental health and other specialties of clinical nurse specialists. A prior study determined about 51% of clinical nurse specialists in Virginia specialize in mental health care.

health specialists. For this study we were inclusive. Figure 3 shows the number of professionals of each type. You will note there are many different types of licenses within most discipline areas. For example, there are 3 categories of psychologists. The largest professional group was licensed clinical social workers followed by professional counselors. Some people are licensed in 2 or more disciplines. They are included in this chart for each license that they hold. Even though this list is extensive there are groups we cannot identify such as psychiatric nurse practitioners. Note that the usual professionals that are considered when determining a shortage area—psychiatrists, psychologists, licensed clinical social workers, psychiatric nurse specialists, and marriage and family therapists are a limited part of all of the different practitioners potentially available to provide mental health care. This may be a particularly important issue in rural areas where health professionals are often generalists who have a broad scope of responsibilities owing to the absence of many different specialties to serve the population (Merwin, Goldsmith, & Mandersheid, 1995).

A comparison was made with licensure data from 1996 obtained for a subset of the providers. Figure 4 shows that each type of mental health

professional group increased in the number of providers. Therefore, the state was experiencing a growth in the availability of mental health providers between 1996 and 2000. However, further evaluation of changes on a county level revealed that the growth was seen mainly in the same areas that already had a larger availability of providers. This finding was further explored through graphic analysis. The map in Figure 5 shows the geographic maldistribution of mental health providers in Virginia. There is a large amount of variability in the rate of mental health professionals to the population. The map includes numbers to designate the different community service boards responsible for mental health care provision for the different geographic areas. Clearly some service boards are challenged with the near absence of mental health providers throughout their regions of responsibility (see Merwin, Hinton, & Dembling, 2002 for additional information on this map and for additional maps showing the availability of all types of mental health providers presented on an individual basis).

CONCLUSIONS

Understanding the relationship of supply and demand for rural health and mental health professionals is a key component to improving mental

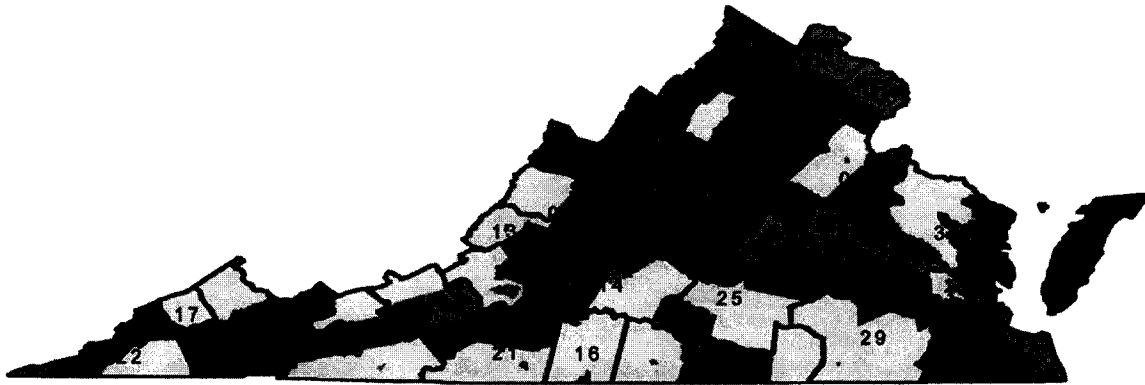


Fig 5. Virginia mental health professionals. Southeastern Rural Mental Health Research Center total professionals per 10,000: □, 0–2.16; □, 2.37–4.79; □, 4.85–10.02; □, 10.08 and over. Data from Merwin et al. (2002). *Shortages of mental health professionals in Virginia*. Virginia Primary Care Association. Available: <http://www.vpca.com/>.

health care in rural areas of our country. The challenges of rural health care require adaptations of system and clinical interventions that work in urban and suburban areas. A fallacy is that changes in practice can be implemented in the same way in rural areas. Another myth is that primary care providers can step in and fill the roles of absent mental health specialists. These analyses document that the availability of primary care providers also are lower in rural areas. This influences the amount of time these providers have available to deliver mental health care. In fact, a recent study by Ng, Bardwell, and Camacho (2002), after a small survey of physicians in a rural area of California concluded that, “most physicians still prefer referring depressed patients to a mental health specialist, in spite of practicing in an underserved area and other barriers to access.” Research is needed to determine optimal ways to increase the availability of these specialists and to implement system improvements and changes to clinical practice reflective of evidence-based care. All of these changes require the availability of professionals as well as their inclusion in any plans for system or practice changes.

The Southeastern Rural Mental Health Research Center has reviewed the results of its many studies of the rural mental health system and have identified areas that offer potential benefit for system improvement. They are reflected in the following research agenda that was presented at a recent national conference of rural health (Merwin, 2001). (1) Develop innovative ways to overcome barriers and increase access to state-of-the-art care;

(2) determine strategies to work with existing informal care networks and community resources such as churches and social service agencies to improve access to mental health care through faith-based initiatives and integration with welfare reform initiatives; (3) adapt empirically validated interventions to improve access to care and outcomes for rural individuals, ensuring cultural acceptability of care; (4) to develop recruitment, retention, and training strategies to overcome mental health provider shortages and maintain a competent workforce; (5) to determine the feasibility and effectiveness of telehealth communication in achieving goals 1 through 4.

All of these research agenda items necessitate the incorporation of general health and mental health professionals in system and clinical interventions to improve access or outcomes of mental health care. The availability of these professionals and the interaction and integration of general health and mental health providers facilitated by technology will serve as the basis for service delivery improvements. Creating a system of care that facilitates the incorporation of clinical care reflective of the most current evidence-based care is the goal. For this to occur in rural areas it will be necessary to determine necessary system changes to support increased availability, competency, and support of rural health professionals struggling with unique challenges of rural practices.

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