



Published in final edited form as:

Rural Ment Health. 2011 ; 35(2): 35–45.

Workforce Capacity for Reducing Rural Disparities in Public Mental Health Services for Adults with Severe Mental Illness

Richard L. Hough,

Center for Rural and Community Behavioral Health, Department of Psychiatry, University of New Mexico Health Sciences Center, Albuquerque, New Mexico, Pacific Institute for Research and Evaluation, Behavioral Health Research Center of the Southwest, Albuquerque, New Mexico

Cathleen E. Willging,

Pacific Institute for Research and Evaluation, Behavioral Health Research Center of the Southwest, Albuquerque, New Mexico

Deborah Altschul, and

Center for Rural and Community Behavioral Health, Department of Psychiatry, University of New Mexico Health Sciences Center, Albuquerque, New Mexico

Steven Adelsheim

Center for Rural and Community Behavioral Health, Department of Psychiatry, University of New Mexico Health Sciences Center, Albuquerque, New Mexico

Introduction

Mental illness is common, costly and largely untreated in the United States (U.S.). Although the prevalence of mental illness in rural and urban areas is similar (Kessler et al., 1994), rural disparities exist in availability of specialty and non-specialty services (Institute of Medicine, 2005; Reschovsky & Staita, 2005; Wang et al., 2005; Hauenstein & Peddada, 2007; Ellis et al., 2009; Konrad et al., 2009; Thomas et al., 2009). Rural residents are more likely than their urban counterparts to enter treatment later in the course of mental illness with more serious and persistent symptoms that require expensive and intensive treatment (Wagenfeld et al., 1994).

The President's New Freedom Commission (2003) called for the elimination of service disparities in rural areas by addressing barriers in access, acceptability and availability. Barriers to accessibility include unemployment, poverty, inability to pay for services, inadequate insurance, transportation, and lack of knowledge of the need for and availability of care (Fortney et al., 2001; Merwin, Snyder, & Katz, 2006). Barriers to acceptability include stigma, confidentiality concerns, attitudes of self-reliance, and lack of cultural competence among providers (Willging, Waitzkin, & Nicdao, 2008).

This article focuses on the third barrier—availability of services related to rural disparities in workforce capacity. General disparities between rural and urban workforce capacities are well documented (Fortney et al., 2001; Merwin, Snyder, & Katz, 2006; Ellis et al., 2009; Konrad et al., 2009; Thomas et al., 2009). Disparities between different rural and urban environments and the impact of these disparities on service planning and program development remain an issue.

To maximize utility for public health planning, research is needed that moves beyond simple documentation of global rural and urban disparities in workforce capacity to studies that focus on: (1) workforce capacity in publicly-funded mental health agencies (PFMHAs) that provide the bulk of care; (2) variations in workforce capacity across functional MHSAs rather than larger geographic units such as states; (3) disparities in workforce capacity in relation to the size of specific target populations (e.g., low-income adults with serious mental illness (SMI) (Morrisey et al., 2007; Ellis et al., 2009; Konrad et al, 2009; Thomas et al., 2009); (4) workforce capacity of types of specialty and non-specialty providers (Dial et al., 1998; Ivey, Scheffler & Zazzali, 1998); and (5) workforce capacity in full time equivalent (FTE) positions rather than estimates of the number of providers from professional association registries or other sources (Eveland et al., 1998; Dial et al., 1998; Baldwin et al., 2006). Such research will help public health planners to more directly understand and address disparities in public mental health service capacity of functional MHSAs that may have very different mixes of types of specialty and non-specialty providers available and degrees of need for services by specific target populations who have particular types of mental health problems.

This article investigates availability of mental health provider FTEs in PFMHAs serving low-income adults with SMI in rural New Mexico. Patterns of workforce capacity are explored across a range of provider types in metropolitan, micropolitan and non-core MHSAs, and in relation to synthetic prevalence estimates of the size of the target population within MHSAs.

Study Setting

New Mexico is an economically challenged and sparsely populated state, with an estimated 2,009,671 people spread across 121,356 square miles. Of its 33 counties, 32 have federally Health Professional Shortage or Medically Underserved Areas as designated by the U.S. Health Resources and Services Administration (2010). Close to 60% of adults reside in households below 300% of the federal poverty level. The state is ethnically diverse with 45.6% of the population Hispanic, 40.9% White, Non-Hispanic, and 9.7% Native American (U.S. Bureau of Census, 2010).

Methods

Workforce Capacity Survey

A statewide telephone survey of PFMHAs was conducted between August 2006 and January 2007 as part of a 5-year, multi-method study of the impact of a major mental health reform on access to and quality of care for adults with SMI (Semansky, Hodgkin, & Willging, 2011; Semansky et al., 2009). Our survey focused on PFMHAs since they provide the majority of mental health care in rural areas. The development of the PFMHA sample is described elsewhere (Semansky et al., 2009). For the purpose of the study, PFMHAs were defined as agencies: 1) serving adults with SMI; 2) accepting Medicaid or state-funded indigent dollars; and 3) comprising a group practice or agency. Independent or private practitioners were excluded, as the goal was to understand issues pertinent to planning and policy at the publicly-funded agency level. Agencies that offered services only to youth were also excluded. Seventy-four agencies met all criteria. Chief executive officers and clinical directors of 66 PFMHAs completed the survey (89.2% response rate). Most non-participating agencies were for profit entities that expressed concern about sharing proprietary information. Some 41% of the participating PMHSAs were licensed by the State of New Mexico Behavioral Health Services Division to operate as community mental health centers, 54% were private non-profit, 21% were private for-profit and 13% were federal

agencies (e.g., Indian Health Service). At least six of the PFMHAs offered inpatient as well as outpatient services.

Workforce Capacity Information

Respondents reported direct service provider FTEs employed or contracted to serve low-income adults with SMI from July 1, 2005 to June 30, 2006, including specialty providers (psychiatrists, psychiatric nurses, psychologists, social workers, counselors), community providers (case managers and paraprofessionals), substance abuse counselors and “other” non-specialty providers (physicians and nurses delivering mental health care).

MHSAs

As defined by the U.S. Bureau of Census, micropolitan counties have no urbanized areas and a cluster of 10,000 or more persons. Non-core counties have clusters of less than 10,000 persons. Micropolitan and noncore counties are generally regarded as rural. Metropolitan areas include one or more urbanized region with 50,000 persons or more, and economically dependent outlying counties, i.e., more than 25% of residents commute to the metropolitan area for work.

The 33 New Mexico counties were initially categorized into three rural and two metropolitan MHSA types. The rural MHSAs consist of: (1) 14 Micropolitan counties ranging in population from 12,000 (Los Alamos) to 62,000 (Otero and Chaves) with a combined population of 496,063; (2) two contiguous micropolitan counties (McKinley and San Juan) in which the total of 198,348 residents include a sizeable Native American population; and (3) a Non-Core category of 11 counties with a combined population of 79,968 (ranging from less than 1,000 in Harding to 18,000 in Socorro).

There were two metropolitan categories. The Albuquerque Metropolitan MHSA incorporated Bernalillo, Sandoval, Torrance and Valencia Counties with a total population of 814,761. This area was examined separately because it includes over 40% of the state's population and most of its workforce capacity. The Other Metropolitan MHSA category included Las Cruces/Doña Ana County and Santa Fe County with a combined population of 336,295.

Two micropolitan counties were excluded from the analyses. San Miguel County was excluded because it is home to the only state-operated adult psychiatric inpatient facility and possesses nearly a third of the state's PFMHA workforce capacity; its inclusion would have skewed results. Curry County was excluded because data from the local PFMHA could not be obtained.

Prevalence Estimates

Epidemiologists at the University of Texas Medical Branch in Galveston, under contract with the Western Interstate Consortium for Higher Education (2008), developed SMI prevalence estimates using synthetic estimation procedures. The procedures apply prevalence estimates for a wide range of sociodemographic groups from national epidemiologic surveys to the same groups in local geographic areas. This results in differential estimates of prevalence for local areas that are more sensitive to variations in need for treatment than the usual procedure of applying flat rates to local areas (Konrad et al., 2009). The estimates in this study were for the number of adults with SMI in households with incomes less than 300% of the federal poverty level. Estimates were calculated for counties and aggregated to the MHSA categories described above. The estimates were based on the National Comorbidity Survey-Replication, the best available prevalence data for mental disorders in the U.S. (Kessler et al., 2003).

Distribution of PFMHAs

The distribution of PFMHAs serving adults with SMI mirrored the distribution of the low-income population by MHSAs category (Table 1). Some 25% of the low-income population and 26% of the PFMHAs were in micropolitan MHSAs; 3.3% of the population and 1.4% of the PFMHAs were in non-core areas; 10.6% of the population and 11% of the PFMHAs were in Native American micropolitan counties; 43% of the population and 41% of the PFMHAs were in the Albuquerque metropolitan MHSAs; and 18% of the low-income population and 21% of the PFMHAs were in the two other metropolitan areas.

Workforce in Micropolitan PFMHAs

Table 2 shows the distribution of PFMHA provider FTEs across micropolitan MHSAs. Given the almost complete absence of provider capacity in the non-core MHSAs, six were combined with the nearest micropolitan MHSAs for these analyses. The maximum driving distance to obtain services in two of these combined MHSAs was over 150 miles. Four of the ten non-core MHSAs were dropped from the analysis because they were naturally part of the two larger micropolitan based service areas (Las Vegas and Clovis) excluded from analysis for lack of appropriate data (see above). Table 2 examines variations in PFMHA workforce capacity to serve low-income adults with SMI across 15 micropolitan MHSAs and the combined three metropolitan MHSAs.

Overall Patterns

Sizable differences in the ratio of low-income adults with SMI to PFMHA provider were found among micropolitan MHSAs. For example, in terms of total workforce, two micropolitan MHSAs had fewer low-income adults with SMI to PFMHA provider (18) than the metropolitan MHSAs (24). At the other end of the continuum, two micropolitan MHSAs reported no PFMHA provider and another four reported six to almost ten times as many low-income adults with SMI per PFMHA provider as the two best staffed micropolitan MHSAs. This suggests even more disparity between the micropolitan MHSAs with the highest and lowest workforce capacity than between micropolitan and metropolitan MHSAs in general.

Three tiers of PFMHA workforce capacity in the micropolitan MHSAs were identified on the basis of the ratio of estimated low-income adults with SMI to total PFMHA workforce FTE. The first tier had a maximum ratio of 36:1; the second tier from 40:1 to 112:1; and the third tier from 142:1 to 265:1 or no workforce capacity at all. Service providers in the first tier micropolitan PFMHAs tended to serve approximately the same number of low-income adults with SMI as those in metropolitan PFMHAs. Providers in PFMHAs in the second tier MHSAs tended to be responsible for approximately twice as many low-income adults with SMI as providers in first tier or metropolitan MHSAs. Finally, the number of low income adults with SMI per provider FTE in the third tier MHSAs tended to be much larger or, in some instances, there was no provider FTE at all.

Workforce in Micropolitan PFMHAs by Type of Provider

Table 2 shows disparities among micropolitan MHSAs by provider type.

Psychiatrists

Disparities across rural and metropolitan MHSAs in availability of psychiatrists in PFMHAs were pronounced. The low-income adults with SMI to psychiatrist FTE ratio in metropolitan MHSAs was 276:1 as compared to 409:1 in the first tier micropolitan MHSAs, 1028:1 in second tier MHSAs and 4549:1 in third tier micropolitan MHSAs. In the third tier, two

MHSAs reported no psychiatrist FTE and two reported exorbitant ratios of low-income SMI to psychiatrist FTE (Española with 11,540:1 and Carlsbad with 6,900:1).

Independently Licensed Therapists and Therapists Requiring Supervision

The low-income SMI to therapist FTE ratio in PFMHAs varied from 75:1 in metropolitan MHSAs to 87:1 in the first tier micropolitan MHSAs, 157:1 in the second tier micropolitan MHSAs and 500:1 in the third tier micropolitan MHSAs.

Interestingly, the expected disparities between metropolitan and micropolitan MHSAs were not always found. For example, the ratio of low-income adults with SMI to therapist FTE in PHMHAs serving the two first tier MHSAs was actually lower (51:1 in Silver City and 54:1 in Portales) than in metropolitan MHSAs (75:1). Similarly, two second tier MHSAs reported lower ratios (Socorro with 61:1 and Los Alamos with 72:1) than metropolitan MHSAs. However, disparities were dramatic for some micropolitan MHSAs. For example, two MHSAs in the third tier reported no therapist FTE and the three others had ratios of low-income adults with SMI to therapist FTE that were 3.5 to 6.5 times as high as metropolitan MHSAs.

Psychiatric Nurses

Psychiatric nurses were found in PMHSAs in only five of the 15 micropolitan MHSAs. Only in the Silver City MHSA were they found in any concentration (145 low-income adults with SMI per psychiatric nurse FTE). This service capacity of psychiatric nursing in the Silver City MHSA actually exceeded that in metropolitan MHSAs where there was a ratio of 182 low-income adults with SMI per psychiatric nurse FTE.

Other Non-Specialty Mental Health Providers

Disparities in the distribution of low-income adults with SMI per PFMHA physician, nurse or other professional FTE were also found, with seven of the micropolitan MHSAs reporting no such providers. The ratios ranged from 557:1 in metropolitan MHSAs to 162:1 in first tier, 1097:1 in second tier and 5004:1 in third tier micropolitan MHSAs. However, three of the MHSAs in the first micropolitan tier (Silver City, Roswell and Taos) and two from the second tier (Socorro and Gallup) reported lower ratios than the average metropolitan MHSA.

Case Managers

The ratio of low-income adults with SMI to PFMHA case manager FTE was 258:1 in metropolitan MHSAs and 109:1, 613:1 and 5004:1 in the first, second and third tier micropolitan MHSAs respectively. PFMHAs in all four first tier MHSAs reported lower ratios (from 88:1 to 158:1) than those in metropolitan MHSAs (258:1). In the second tier, the ratios in the Socorro (243:1) and Hobbs (193:1) MHSAs were also lower than for metropolitan MHSAs. Serious disparities also existed between micropolitan MHSAs; five reported no case manager FTE and the ratios in the others ranged from 88:1 to 1380:1.

Paraprofessionals

Mental health technician, psychosocial rehabilitation and other paraprofessional workforce capacity was significantly lower in micropolitan than in metropolitan MHSAs. The ratio of low-income adults with SMI to PMHSA paraprofessional FTE was 92:1 in metropolitan MHSAs and 118:1 in first tier, 787:1 in second tier and 1668:1 in third tier micropolitan MHSAs. In the first tier micropolitan MHSAs only, Portales and Silver City reported lower ratios of low-income adults with SMI per paraprofessional FTE (42:1 and 65:1 respectively) than metropolitan MHSAs (92:1). The two other first tier MHSAs had approximately 2.5

times as many SMI per paraprofessional FTE. The ratio in the Farmington MHSAs was ten times as high as the metropolitan MHSAs. Four of the five MHSAs in the third tier reported no paraprofessional FTE.

Independently Licensed Substance Abuse Counselors and Substance Abuse Counselors Requiring Supervision

The ratio of low-income adults with SMI to PFMHSA substance abuse counselor FTE was 386:1 in metropolitan MHSAs, 2360:1 in first tier, 791:1 in second tier and 2502:1 in third tier micropolitan MHSAs. Overall, substance abuse workforce capacity was lower in micropolitan areas than for any other provider type. None of the micropolitan MHSAs had a lower ratio of low-income adults with SMI to substance abuse counselor FTE than metropolitan MHSAs. Three of the first tier, one second tier and three third tier (seven of the total 15) micropolitan MHSAs had no substance abuse counselor FTE.

Summary of Findings

Although the distribution of PFMHAs in New Mexico mirrors the distribution of low-income adults with SMI across categories of metropolitan and rural MHSAs, serious disparities in availability of providers persist. The ratio of low-income adults with SMI per provider FTE was generally much higher in micropolitan and non-core than in metropolitan MHSAs. However, closer examination by types of provider revealed that not all micropolitan MHSAs experienced significant disparities in comparison to metropolitan MHSAs.

For every type of provider except substance abuse counselors there was at least one micropolitan MHSAs that reported a lower ratio of low-income adults with SMI per PFMHA provider FTE than metropolitan areas. The ratio of low-income adults with SMI to case manager FTE was lower in six of the micropolitan MHSAs than in metropolitan MHSAs. The same was true for five of the micropolitan MHSAs in terms of physicians, nurses and other nonspecialty professionals. Even in terms of specialty provider FTEs, PFMHAs in two micropolitan MHSAs (Portales and Silver City) reported fewer low-income adults with SMI per provider.

In general, disparities in workforce capacity were greater within micropolitan MHSAs than between metropolitan and rural MHSAs. A first tier included four MHSAs that, across provider type, had nearly the same level of workforce capacity and often greater capacity than metropolitan MHSAs. A second tier of six MHSAs had substantially less workforce capacity than either the first tier or metropolitan MHSAs across provider types. This tier included the two large micropolitan MHSAs with Native American populations (Gallup and Farmington MHSAs). Finally, a third tier of five micropolitan MHSAs was identified that had little or no mental health workforce capacity to address the needs of their low-income adults with SMI.

Discussion

This study documents disparities between urban (metropolitan) and rural (micropolitan and non-core) MHSAs in mental health workforce capacity (Institute of Medicine, 2005; Wang et al., 2005; Hauenstein & Peddada, 2007; Ellis et al., 2009; Konrad et al., 2009; Thomas et al., 2009). This study also illuminates important variations in the kinds of disparities found within non-core areas, micropolitan MHSAs and micropolitan MHSAs with Native American populations. For instance, there is virtually no PFMHA workforce to provide local mental health services to low-income adults with SMI in noncore areas. These areas continue to depend on PFMHAs in nearby micropolitan MHSAs for services.

Disparities in workforce capacity between micropolitan MHSAs were notable. Policy and program development efforts to lessen disparities must not rely on the assumption that workforce capacity is the same across non-metropolitan service areas. This study identified three tiers of MHSAs between which workforce capacity varied as much or more than between micropolitan and metropolitan MHSAs. PFMHAs in these tiers must be regarded independently in terms of workforce strengths and weaknesses.

The first tier of micropolitan MHSAs possesses workforce capacities that approach and sometimes exceed those of metropolitan MHSAs in terms of low-income adults with SMI per PFMHA provider FTE. These MHSAs can therefore be considered a principal resource for improving the quality of mental health care for micropolitan and non-core service areas.

An important reason for heightened workforce capacity in first tier micropolitan MHSAs may be that three of four are home to universities with training programs for behavioral health professionals. The fourth first tier MHSAs also benefits from solid connections to higher education. This suggests the importance of developing close linkages with training programs.

The second tier micropolitan MHSAs reported low-income adults with SMI to PFMHSA provider FTE ratios from 61:1 to 274:1 and strong capacity in terms of independent and supervised therapists and case managers. The ratio of low-income adults with SMI to case manager FTE was lower than for metropolitan MHSAs in two micropolitan MHSAs, moderately higher in two others and extremely high in one. The potential caseloads of psychiatrist, psychiatric nurse, paraprofessional and substance abuse counselor FTEs were extremely high.

The two micropolitan MHSAs with higher numbers of Native American residents (Gallup and Farmington) have the greatest challenges in terms of total workforce capacity among the six second tier MHSAs. These disparities are likely the result of a combination of higher than average prevalence of SMI in the low-income adult population, extreme poverty, small and isolated rural environments in which it is difficult to provide and support services, special needs related to delivering culturally appropriate mental health care and the organizational complexities of service delivery in tribal communities.

The third tier of micropolitan MHSAs has little or no workforce capacity. Two of the five MHSAs in this category report no FTEs for any type of provider. While there is some capacity in terms of psychiatrists and therapists in PFMHAs, the numbers of potential clients per FTE are overwhelming, and substance abuse counselor FTEs are limited. These disparities can be traced to the relatively isolated, small and low-income status of MHSAs in this tier. Thus, planning is clearly needed.

Implications for Reducing Disparities in Workforce Capacity to Serve Adults with SMI

Although the number of FTEs in first tier micropolitan PFMHAs is insufficient to ensure state of the art care for low-income adults with SMI, the numbers are at least comparable to those in metropolitan MHSAs in the state. The most notable exceptions were found in the ratio of low-income adults with SMI to psychiatrist FTE in Roswell and the general lack of psychiatric nurse and substance abuse counselor FTEs across the four MHSAs. Importantly, parity in the ratio of low-income adults with SMI to provider FTE is not necessarily an indicator of the quality of care across MHSAs. For example, the actual number of psychiatrist FTEs in PFMHAs in micropolitan MHSAs remains very small compared to the concentration of psychiatrists in the Albuquerque MHSAs. Psychiatrists in micropolitan MHSAs are forced to be “psychiatric generalists” who treat a wide range of disorders, while those in metropolitan MHSAs can specialize. Lack of time and resources can compromise

the psychiatric generalist's ability to stay current with the latest evidence-based diagnostic and treatment models emerging in relation to specific types of mental health problems. Lessening disparities in the quality of psychiatric care will require intense efforts to increase the range of psychiatric expertise available in micropolitan and other rural areas. Similarities in therapist caseloads in first tier micropolitan MHSAs and metropolitan MHSAs may disguise significant disparities in quality of care. Subsequent analyses showed that the ratio of therapists requiring supervision to independent therapists was significantly higher in micropolitan than metropolitan MHSAs. Additionally, therapists in micropolitan areas incur greater expense and labor burden than their urban peers to deliver care to the same number of adults due to the distances they must travel.

The core of the second tier MHPA workforce largely consists of FTE independent and supervised therapists (72.2), case managers (26.3) and paraprofessionals (22.6). Disparities in psychiatrist FTEs (12.3) and psychiatric nurse FTEs (4.3) relative to low-income adults with SMI needing service were acute. These disparities limit workforce capacity to accurately diagnose complex conditions, deliver suitable treatments, and provide medication management. Substance abuse counselor FTEs (16.5) were also low in relation to the number of low-income adults with SMI.

There is little likelihood of quickly increasing the size of the workforce in second and third tier MHSAs. Efforts to reduce such disparities by federal and state governments over the last 30 years have been largely unsuccessful. The research literature documents that it is incredibly difficult to recruit and keep mental health professionals in rural areas for a number of reasons—lower salaries, professional isolation, difficulties finding work for spouses, limited social outlets and educational opportunities for one's children, the discomfort of transitioning from urban training environments to rural life, and an insufficient population base to support services (Wagenfeld et al., 1994; Merwin et al., 1995; Institute of Medicine, 2005; Meyer et al., 2005).

Decreasing disparities in quality of care between the first tier micropolitan and metropolitan MHSAs is more likely to be achieved by enhancing training and support for the existing core of therapists and non-specialty providers. Decreasing disparities in availability and quality of care in PFMHAs in second and third tier micropolitan MHSAs will be more difficult. Improvement may require greater enhancement of the extant workforce of case managers, independent and supervised therapists, paraprofessionals, and other non-specialty providers, and increasing collaboration between organizations in first tier micropolitan and metropolitan MHSAs to provide direct services. Disparities in the number of substance abuse counselors in micropolitan PFMHAs is particularly acute, limiting the provision of appropriate services for comorbid mental health and substance abuse conditions. These and other disparities may be partially addressed through national health care reform, as micropolitan PFMHAs will be required to provide a full range of behavioral health services. Supplementing the rural workforce with resources from metropolitan MHSAs via telebehavioral health and web-based technologies will also help facilitate direct service, consultation and collaboration. These technologies lend themselves to interactive distance learning and continuing education opportunities (Institute of Medicine, 2005; Kriechman, Salvador, & Adelsheim, 2010). Finally, evidencebased practice implementation for comorbid conditions may be facilitated through intensive training, coaching and supervision by remote technical assistance centers and performance assessment teams (Bond et al., 2008; Bruns et al., 2008).

Facilitating coordination of services in rural areas is also important (Institute of Medicine, 2005). Mechanisms include: clinical homes (Smith & Sederer, 2009); integrated service agency models (Chandler et al., 1996); wraparound models for adults (Walker & Bruns,

2006); intensive case management (Meuser et al., 1998); cross training (Fleury & Mercier, 2002); and co-location of mental health and primary care (Badger, Robinson, & Farley, 1999). Other recommendations capitalize on de-facto rural systems of care to augment available workforce (broad networks of mental health, social, educational, health, vocational, religious, peer-support, self-help and other community services and supports) (Fox, Merwin, & Blank, 1995). With continuous education and performance improvement programs stressing identification of disorders, referral and treatment, local communities can assist in upgrading delivery systems for low-income adults with SMI (Fried et al., 1998; Gale & Deprez, 2003; Meyer et al., 2005).

In terms of mental health care system design, this study also suggests that it is extremely important to develop mechanisms to encourage coordination of care across local and regional MHSAs. Mechanisms might include statewide organization of micropolitan and non-core MHSAs around the kinds of relatively high capacity centers found in the first tier of micropolitan MHSAs that have direct access to pipelines of academic training for providers and the provision of incentives for local PFMHAs to extend services and support to lower service capacity MHSAs in their geographic region. Equally important is finding mechanisms to encourage high capacity metropolitan PFMHAs to provide services and support for first tier micropolitan service centers. Resources to support these mechanisms have been limited and the evidence base for their effectiveness is mixed. Several demand support from urban specialty centers that are themselves under-resourced. However, any improvement in the quality of the core micropolitan PFMHA workforce will likely depend on the deployment and evaluation of such mechanisms.

Reducing Service Disparities within Native American MHSAs

Workforce disparities in the two Native American micropolitan MHSAs deserve particular attention. Each is roughly twice as large in population as the other micropolitan MHSAs. The estimated rates of SMI among low-income adults in these communities are the largest among the micropolitan MHSAs. The extreme poverty of the local population makes it unlikely that individuals seek help from sources other than PFMHAs. A core infrastructure of psychiatrists, independent and supervised therapists, case managers and paraprofessionals is often absent. The dearth of substance abuse counselors is critical given the pervasiveness of alcohol and drug use disorders that occur in combination with mental illness. Cultural differences between service users and providers also limit access to appropriate care. Until academic and other pipelines of training are fully developed and supported, the effectiveness of the supplemental strategies suggested above for micropolitan MHSAs will exert little effect on quantity or quality of care. The workforce should be attuned to cultural issues that affect service utilization and appropriate diagnosis and treatment. The Indian Health Service and tribally-run behavioral health programs are key resources for enhancing the workforce. Recent service expansion in New Mexico include extension of telebehavioral health services, capacity building through training that integrates traditional and Western approaches, and programs to increase the matriculation of Native American residents into behavioral health programs of higher education.

Limitations

Five of the eight PFMHAs that opted out of the survey were in metropolitan MHSAs so there is some underestimation of the size of the urban workforce. The other three PFMHAs were in micropolitan MHSAs (Clovis, Farmington, and Roswell), possibly resulting in some slight underestimation of workforce capacity in these locations as well.

This study does not consider rural workforce capacity beyond the agencies surveyed. Studies of the broader de-facto mental health workforce in rural environments are needed. This

study also does not address workforce training, quality and effectiveness and the impact of organizational climate and culture on services (Hemmelgarn, Glisson, & James, 2006).

Synthetic estimation does not offer precise estimates of a local population's needs that more direct, but prohibitively expensive, epidemiologic surveys provide. Synthetic estimation based on the most extensive epidemiologic data available is a reasonable, cost-effective alternative.

Studies on which the need estimates in this paper are based do not include representative samples of Native Americans. In our study, the higher rates of SMI for the rural MHSAs in which Native Americans were concentrated are likely the result of low educational attainment and high poverty levels within these regions. It is likely that synthetic estimations of need based on direct surveys of the Native American populations included in this study would have been higher and made the workforce disparities even more alarming. This study focuses only on one priority population for public mental health—low-income adults with SMI. The needs of children, adolescents and individuals with less severe mental health problems were not considered. Studies of workforce capacity for these other priority populations may contribute to planning and program development in public health systems.

Finally, this study's findings are limited to behavioral health needs and workforce conditions in only one state. Their generalizability to other states may be limited. However, the approach employed in this study may be useful in other states with sizable rural populations.

Conclusion

The nation faces considerable challenges in increasing workforce capacity to provide quality mental health care to vulnerable populations in rural states. This study examined workforce capacity in PFMHAs in micropolitan as compared to metropolitan MHSAs. The study demonstrated great variability in workforce capacity in micropolitan MHSAs that must be taken into account in planning and program development efforts. In the first tier of micropolitan MHSAs, workforce capacity approached that found in metropolitan MHSAs and efforts may be best concentrated on quality improvement. In the other two tiers of micropolitan MHSAs, the workforce is extremely limited and not likely to increase substantially in the near future. Concerted efforts to better leverage the core workforce in micropolitan MHSAs can lead to more comprehensive, higher quality services. At present, the core workforce does not have high levels of training in specialty care or adequate access to support from urban areas. In MHSAs with large Native American populations, there is minimal infrastructure for improvement. Future efforts must strive to establish sustainable mechanisms for ongoing training, education and support for the core workforce in micropolitan MHSAs and for de-facto rural systems of care in general.

Acknowledgments

This research was supported by grant number R01 MH76084 from the National Institute of Mental Health and the Substance Abuse and Mental Health Services Administration awarded to Dr. Willging; however, the views expressed in this paper are the authors' alone.

Reference List

- Badger L, Robinson H, Farley T. Management of mental disorders in rural primary care: a proposal for integrated psychosocial services. *J Fam Pract.* 1999; 48:813–818. [PubMed: 12224680]
- Baldwin LM, Patanian MM, Larson EH, Lishner DM, Mauksch LB, Katon WJ, et al. Modeling the mental health workforce in Washington State: using state licensing data to examine provider supply in rural and urban areas. *J Rural Health.* 2006; 22:50–58. [PubMed: 16441336]

- Bond GR, Mchugo GJ, Becker DR, Rapp CA, Whitley R. Fidelity of supported employment: lessons learned from the National Evidence-Based Practice Project. *Psychiatr Rehabil J*. 2008; 31:300–305. [PubMed: 18407879]
- Bruns EJ, Hoagwood KE, Rivard JC, Wotring J, Marsenich L, Carter B. State implementation of evidence-based practice for youths, part II: recommendations for research and policy. *J Am Acad Child Adolesc Psychiatry*. 2008; 47:499–504. [PubMed: 18438187]
- Chandler D, Meisel J, Hu TW, McGowen M, Madison K. Client outcomes in a 3-year controlled study of an integrated service agency model. *Psychiatr Serv*. 1996; 47:1337–1343. [PubMed: 9117472]
- Dial TH, Bergsten C, Haviland MG, Pincus HA. Psychiatrist and nonphysician mental health provider staffing levels in health maintenance organizations. *Am J Psychiatry*. 1998; 155:405–408. [PubMed: 9501753]
- Ellis AR, Konrad TR, Thomas KC, Morrissey JP. County-level estimates of mental health professional supply in the United States. *Psychiatr Serv*. 2009; 60:1315–1322. [PubMed: 19797370]
- Eveland AP, Dever GE, Schafer E, Sprinkel C, Davis S, Rumpf M. Analysis of health service areas: another piece of the psychiatric workforce puzzle. *Psychiatr Serv*. 1998; 49:956–960. [PubMed: 9661233]
- Fleury MJ, Mercier C. Integrated local networks as a model for organizing mental health services. *Adm Policy Ment Health*. 2002; 30:55–73. [PubMed: 12546256]
- Fortney J, Thill JC, Zhang M, Duan N, Rost K. Provider choice and utility loss due to selective contracting in rural and urban areas. *Med Care Res Rev*. 2001; 58:60–75. [PubMed: 11236233]
- Fried BJ, Johnsen MC, Starrett BE, Calloway MO, Morrissey JP. An empirical assessment of rural community support networks for individuals with severe mental disorders. *Community Ment Health J*. 1998; 34:39–56. [PubMed: 9559239]
- Gale, JA.; Deprez, RD. A public health approach to the challenges of rural mental health service integration.. In: Stamm, BH., editor. *Rural Behavioral Health Care: An Interdisciplinary Guide*. American Psychological Association; Washington, DC: 2003. p. 95-108.
- Hauenstein EJ, Peddada S. Prevalence of major depressive episodes in rural women using primary care. *J Health Care Poor Underserved*. 2007; 18:185–202. [PubMed: 17337807]
- Hemmellgarn AL, Glisson C, James LR. Organizational culture and climate: implications for services and interventions research. *Clin Psychol*. 2006; 13:73–89.
- Institute of Medicine. *Quality through Collaboration: The Future of Rural Health Care*. The National Academies Press; Washington, DC: 2005.
- Ivey SL, Scheffler R, Zazzali JL. Supply dynamics of the mental health workforce: implications for health policy. *Milbank Q*. 1998; 76:25–58. [PubMed: 9510899]
- Kessler RC, Berglund P, Demler O, Jin R, Koretz D, Merikangas KR, et al. The epidemiology of major depressive disorder: results from the National Comorbidity Survey Replication (NCS-R). *JAMA*. 2003; 289:3095–3105. [PubMed: 12813115]
- Kessler RC, McGonagle KA, Zhao S, Nelson CB, Hughes M, Eshleman S, et al. Lifetime and 12-month prevalence of DSM-III-R psychiatric disorders in the United States. *Arch Gen Psychiatr*. 1994; 51:8–19. [PubMed: 8279933]
- Konrad TR, Ellis AR, Thomas KC, Holzer CE, Morrissey JP. County-level estimates of need for mental health professionals in the United States. *Psychiatr Serv*. 2009; 60:1307–1314. [PubMed: 19797369]
- Kriechman A, Salvador M, Adelsheim S. Expanding the vision: the strength-based, community-oriented child and adolescent psychiatrist working in schools. *Child Adol Psych Cl*. 2010; 19:149–162.
- Merwin E, Snyder A, Katz E. Differential access to quality rural healthcare: professional and policy challenges. *Fam Community Health*. 2006; 29:186–194. [PubMed: 16775468]
- Meuser KT, Bond GR, Drake RE, Resnick SG. Models of community care for severe mental illness: a review of research on case management. *Schizophrenia Bull*. 1998; 24:37–74.
- Meyer D, Harnel-Lambert J, Tice C, Safran S, Bolon D, Rose-Grippa K. Recruiting and retaining mental health professionals to rural communities: an interdisciplinary course in Appalachia. *J Rural Health*. 2005; 21:86–91. [PubMed: 15667015]

- Morrissey, JP.; Thomas, KC.; Ellis, AR.; Konrad, TR. Geographic Disparities in Washington State's Mental Health Workforce. The Cecil G. Sheps Center for Health Services Research, University of North Carolina; Chapel Hill, NC: 2007.
- North MS, Gleacher AA, Radigan M, Greene I, Levitt JM, Chassman J, et al. Evidence-Based Treatment Center (EBTDC): bridging the research gap in New York State. Report on Emotional and Behavioral Disorders in Youth. 2008; 8:1–5.
- Reschovsky JD, Staiti AB. Access and quality: does rural America lag behind? *Health Aff.* 2005; 24:1128–1139.
- Semansky R, Altschul D, Sommerfeld D, Hough R, Willging C. Culturally competent mental health services in New Mexico: results of a Statewide Survey. *Adm Policy Ment Health.* 2009; 36(5): 289–307. [PubMed: 19370410]
- Semansky RM, Hodgkin D, Willging CE. Preparing for a public sector mental health reform in New Mexico: the experience of agencies in a rural state. *Community Mental Health J.* 2011 in press.
- Smith TE, Sederer LI. A new kind of homeless for individuals with serious mental illness? The need for a “mental health home.” *Psychiatr Serv.* 2009; 60:525–533.
- Thomas KC, Ellis AR, Konrad TR, Holzer CE, Morrissey JP. County-level estimates of mental health professional shortage in the United States. *Psychiatr Serv.* 2009; 60:1323–1328. [PubMed: 19797371]
- U.S. Bureau of Census. [April, 11, 2011] State and County Quick Facts. 2010. Data derived from Population Estimates Available at: <http://quickfacts.census.gov/qfd/states/35000.html>.
- U.S. Health Resources and Services Administration. [April 11, 2011] Health professional shortage areas: Medically underserved areas/ medically underserved populations. 2010. Available at: <http://datawarehouse.hrsa.gov/HPSADownload.aspx>.
- Wagenfeld, MO.; Murray, B.; Mohatt, D.; De-Bruyn. *J. Mental Health and Rural America*, 1980-1993: An Overview and Annotated Bibliography. Office of Rural Health Policy, Health Resources and Services Administration; 1994. (Rep. No. [NIH Publication No. 94-3500])
- Walker JS, Bruns EJ. Building on practice based evidence: using expert perspectives to define the wraparound process. *Psychiatr Serv.* 2006; 57:1579–1585. [PubMed: 17085605]
- Wang PS, Lane M, Olfson M, Pincus HA, Wells KB, Kessler RC. Twelve-month use of mental health services in the United States: results from the National Comorbidity Survey Replication. *Arch Gen Psychiat.* 2005; 62:629–640. [PubMed: 15939840]
- Western Interstate Commission for Higher Education (WICHE) Mental Health Program. 2006 Behavioral Health Prevalence Estimates for New Mexico. State of New Mexico, Human Services Department; Santa Fe, NM: 2008.
- Willging CE, Waitzkin H, Nicdao E. Medicaid managed care for mental health services: the survival of safety net institutions in rural settings. *Qual Health Res.* 2008; 18:1231–1246. [PubMed: 18689536]

Table 1
 Distribution of Population and PFMHAs Serving Low-Income Adults with SMI by Categories of Mental Health Service Area

| Mental Health Service Areas (MHSAs) | 2006 Population | | | | Agencies | | |
|---------------------------------------|-----------------|---------|---------------------------|--------|---------------------------|----------------------------|--|
| | Total | Average | Percent of Total In Study | Number | Percent of Total in Study | Number with Workforce Data | |
| Metropolitan ¹ | 468,790 | 36,051 | 24.9 | 19 | 26.1 | 16 | |
| Native American MHSAs ² | 198,348 | 99,174 | 10.6 | 8 | 11.0 | 7 | |
| Non-Core ³ | 60,728 | 6,072 | 3.3 | 1 | 1.4 | 1 | |
| Albuquerque Metropolitan ⁴ | 814,761 | NA | 43.2 | 30 | 41.1 | 28 | |
| Other Metropolitan ⁵ | 336,295 | 168,148 | 17.9 | 15 | 20.6 | 13 | |
| Total | 1,886,922 | NA | 100.4 | 73 | 100.2 | 65 | |

¹Metropolitan MHSAs comprise 13 counties.

²Metropolitan MHSAs with a high concentration of Native American people include McKinley and San Juan Counties.

³Non-Core MHSAs comprise ten counties.

⁴Albuquerque Metropolitan MHSAs include Bernalillo, Sandoval, Torrance and Valencia Counties.

⁵Other Metropolitan MHSAs include Las Cruces (Doña Ana County) and Santa Fe (Santa Fe County).

Table 2

Distribution of Providers by Type in PFMHAs Serving Low-Income Adults with SMI in New Mexico¹

| Mental Health Service Areas (MHSAs) | Adult Low-income SMI Population | Total workforce FTE | | Psychiatrists | | Independently Licensed & Supervised Therapists ³ | |
|---|---------------------------------|---------------------|-------------|---------------|-------------|---|-------------|
| | | FTE | SMI Per FTE | FTE | SMI Per FTE | FTE | SMI per FTE |
| MICROPOLITAN MHSAs | | | | | | | |
| First Tier | | | | | | | |
| Portales (Roosevelt Cty) | 542 | 30 | 18 | 2.0 | 271 | 10.0 | 54 |
| Silver City (Grant & Hidalgo Counties) | 969 | 55.1 | 18 | 3.4 | 285 | 10.0 | 51 |
| Roswell (Chaves Cty) | 1,766 | 62.0 | 28 | 2.0 | 883 | 18.0 | 98 |
| Taos (Taos, Colfax, Harding & Union Counties) | 1,423 | 39.9 | 36 | 4.1 | 347 | 16.0 | 89 |
| First Tier Totals | 4,700 | 187 | 25 | 11.5 | 409 | 54.0 | 87 |
| Second Tier | | | | | | | |
| Socorro (Socorro, Catron & Sierra Counties) | 1213 | 30.4 | 40 | 0.6 | 2,021 | 10.8 | 112 |
| Los Alamos (Los Alamos Cty) | 195 | 4.1 | 48 | 0.2 | 975 | 3.2 | 61 |
| Alamogordo (Otero Cty) | 1,812 | 35.6 | 51 | 1.1 | 1,647 | 25.2 | 72 |
| Hobbs (Lea Cty) | 1,541 | 28.0 | 55 | 1.0 | 1,541 | 12.0 | 128 |
| Gallup (McKinley Cty) | 3,630 | 46.7 | 78 | 5.3 | 685 | 15.0 | 242 |
| Farmington (San Juan Cty) | 4,665 | 41.7 | 112 | 4.5 | 1,037 | 17.0 | 274 |
| Second Tier Totals | 13,056 | 186.5 | 70 | 12.7 | 1,028 | 83.2 | 157 |
| Third Tier | | | | | | | |
| Espanola (Rio Arriba Cty) | 1,154 | 8.1 | 142 | 0.1 | 11,540 | 3.0 | 385 |
| Grants (Cibola Cty) | 1,032 | 4.8 | 215 | 0.8 | 1,290 | 4.0 | 258 |
| Carlsbad (Eddy Cty) | 1,380 | 5.2 | 265 | 0.2 | 6,900 | 3.0 | 460 |
| Denning (Luna Cty) | 868 | 0.0 | No FTE | 0.0 | No FTE | 0.0 | No FTE |
| Ruidoso (Lincoln Cty) | 570 | 0.0 | No FTE | 0.0 | No FTE | 0.0 | No FTE |
| Third Tier Totals | 5,004 | 18.1 | 276 | 1.1 | 4,549 | 10.0 | 500 |
| METROPOLITAN MHSAs² | 26,294 | 1,087.6 | 24.2 | 95.1 | 276.5 | 348.6 | 75.4 |
| ALL STUDY MHSAs | 49,054 | 1,479.2 | 33.2 | 116.0 | 423 | 495.8 | 98.9 |

| Mental Health Service Areas (MHSA) | Adult Low-income SMI Population | Psychiatric Nurses | | Other Non-Specialty Professional Providers ⁴ | |
|---|---------------------------------|--------------------|-------------|---|-------------|
| | | FTE | SMI Per FTE | FTE | SMI Per FTE |
| MICROPOLITAN MHSA | | | | | |
| First Tier | | | | | |
| Portales (Roosevelt Cty) | 542 | 0.0 | No FTE | 0.0 | No FTE |
| Silver City (Grant & Hidalgo Counties) | 969 | 6.7 | 145 | 11.0 | 88 |
| Roswell (Chaves Cty) | 1,766 | 0.0 | No FTE | 15.0 | 118 |
| Taos (Taos, Colfax, Harding & Union Counties) | 1,423 | 1.0 | 1,423 | 3.0 | 474 |
| First Tier Totals | 4,700 | 7.7 | 610 | 29.0 | 162 |
| Second Tier | | | | | |
| Socorro Socorro, Catron & Sierra Counties) | 1,213 | 0.0 | No FTE | 7.0 | 173 |
| Los Alamos (Los Alamos Cty) | 195 | 0.0 | No FTE | 0.0 | No FTE |
| Alamogordo (Otero Cty) | 1,812 | 1.3 | 1,267 | 0.0 | No FTE |
| Hobbs (Lea Cty) | 1,541 | 2.0 | 771 | 2.0 | 771 |
| Gallup (McKinley Cty) | 3,630 | 2.0 | 1815 | 7.9 | 459 |
| Farmington (San Juan Cty) | 4,665 | 0.0 | No FTE | 2.0 | 2,333 |
| Second Tier Totals | 13,056 | 5.3 | 2,463 | 11.9 | 1,097 |
| Third Tier | | | | | |
| Española (Rio Arriba Cty) | 1,154 | 0.0 | No FTE | 1.0 | 1,154 |
| Grants (Cibola Cty) | 1,032 | 0.0 | No FTE | 0.0 | No FTE |
| Carlsbad (Eddy Cty) | 1,380 | 0.0 | No FTE | 0.0 | No FTE |
| Deming (Luna Cty) | 868 | 0.0 | No FTE | 0.0 | No FTE |
| Ruidoso (Lincoln Cty) | 570 | 0.0 | No FTE | 0.0 | No FTE |
| Third Tier Totals | 5,004 | 0.0 | No FTE | 1.0 | 5,004 |
| METROPOLITAN MHSA² | 26,294 | 144.4 | 182.1 | 47.2 | 557.1 |
| TOTALS | 49,054 | 157.4 | 312.7 | 96.1 | 510.4 |

| Mental Health Service Areas (MHSA) | Adult Low-income SMI Population | Case Managers | | Paraprofessionals ⁵ | | Independently Licensed & Supervised Substance Abuse Counselors | |
|------------------------------------|---------------------------------|---------------|-------------|--------------------------------|-------------|--|-------------|
| | | FTE | SMI Per FTE | FTE | SMI Per FTE | FTE | SMI Per FTE |
| MICROPOLITAN MHSA | | | | | | | |
| First Tier | | | | | | | |
| Portales (Roosevelt Cty) | 542 | 5.0 | 108 | 13.0 | 42 | 0.0 | No FTE |

| Mental Health Service Areas (MHSAs) | Adult Low-income SMI Population | | Case Managers | | Paraprofessionals ⁵ | | Independently Licensed & Supervised Substance Abuse Counselors | |
|---|---------------------------------|-------------|---------------|-------------|--------------------------------|-------------|--|-------------|
| | FTE | SMI Per FTE | FTE | SMI Per FTE | FTE | SMI Per FTE | FTE | SMI Per FTE |
| Silver City (Grant & Hidalgo Counties) | 969 | 108 | 9.0 | 15.0 | 65 | No FTE | 0.0 | No FTE |
| Roswell (Chaves Cty) | 1,766 | 88 | 20.0 | 7.0 | 252 | No FTE | 0.0 | No FTE |
| Taos (Taos, Colfax, Harding & Union Counties) | 1,423 | 158 | 9.0 | 4.8 | 296 | 712 | 2.0 | 712 |
| First Tier Totals | 4,700 | 109 | 43.0 | 39.8 | 118 | 2,350 | 2.0 | 2,350 |
| Second Tier | | | | | | | | |
| Socorro (Socorro, Catron & Sierra Counties) | 1,213 | 243 | 5.0 | 6.0 | 202 | 1,213 | 1.0 | 1,213 |
| Los Alamos (Los Alamos Cty) | 195 | 650 | 0.3 | 0.4 | 488 | No FTE | 0.0 | No FTE |
| Alamogordo (Otero Cty) | 1,812 | No FTE | 0.0 | 4.0 | 453 | 453 | 4.0 | 453 |
| Hobbs (Lea Cty) | 1,541 | 193 | 8.0 | 0.0 | No FTE | 514 | 3.0 | 514 |
| Gallup (McKinley Cty) | 3,630 | 1,210 | 3.0 | 8.0 | 454 | 660 | 5.5 | 660 |
| Farmington (San Juan Cty) | 4,665 | 467 | 10.0 | 4.2 | 1,111 | 1,166 | 4.0 | 1,166 |
| Second Tier Totals | 13,056 | 613 | 21.3 | 16.6 | 787 | 791 | 16.5 | 791 |
| Third Tier | | | | | | | | |
| Espanola (Rio Arriba Cty) | 1,154 | No FTE | 0.0 | 3.0 | 385 | 1,154 | 1.0 | 1,154 |
| Grants (Cibola Cty) | 1,032 | No FTE | 0.0 | 0.0 | No FTE | No FTE | 0.0 | No FTE |
| Carlsbad (Eddy Cty) | 1,380 | 1,380 | 1.0 | 0.0 | No FTE | 1,380 | 1.0 | 1,380 |
| Denning (Luna Cty) | 868 | No FTE | 0.0 | 0.0 | No FTE | No FTE | 0.0 | No FTE |
| Ruidoso (Lincoln Cty) | 570 | No FTE | 0.0 | 0.0 | No FTE | No FTE | 0.0 | No FTE |
| Third Tier Totals | 5,004 | 5,004 | 1.0 | 3.0 | 1,668 | 2,502 | 2.0 | 2,502 |
| METROPOLITAN MHSAs² | 26,294 | 258.5 | 101.7 | 285.7 | 92.0 | 386.7 | 68.0 | 386.7 |
| ALL STUDY MHSAs | 49,054 | 285.2 | 172.0 | 351.1 | 140.7 | 548.1 | 89.5 | 548.1 |

¹ Excluded from this analysis were the Las Vegas MHSA (San Miguel, Guadalupe and Mora Counties) and the Clovis MHSA (Curry, DeBaca and Quay Counties) because workforce data were not available from the dominant provider organization.

² Metropolitan MHSAs included Albuquerque, Las Cruces (Doña Ana County) and Santa Fe (Santa Fe County).

³ Therapists include independent, licensed counselors, psychologists and social workers and those requiring supervision.

⁴ Others include physicians, nurses and other non-mental health professionals delivering mental health services.

⁵ Paraprofessionals include mental health technicians and psychosocial rehabilitation coordinators.