Characterization of Rural Mental Health Service Systems

Michael Calloway, Ph.D., Bruce Fried, Ph.D., Matt Johnsen, Ph.D., and Joseph Morrissey, Ph.D.

ABSTRACT: This paper explores two mental health systems in rural North Carolina that provide services to people with severe mental disorders. Recent findings show rural people with mental disorders receive less mental health care than their urban counterparts. This study asks whether rural service systems differ from urban systems in the way that their services are coordinated and structured. A popular conception is that public mental health systems in the United States are uncoordinated with many services provided outside the mental health sector. Rural service providers are seen as even more dependent on nonspecialized mental health providers than their urban counterparts. While many rural service barriers are attributed to the rural environment, little is known about rural service systems and how their organization might contribute to or negate barriers to care. Social network methods were used in this study to compare two rural with four urban systems of care. Findings confirm that mental health systems fit the de facto hypothesis, but that rural systems differ in ways not anticipated by the hypothesis. Rather than being more dependent on nonmental health agencies, rural mental health agencies are more interdependent.

Rural areas provide a challenging setting for the study of health care issues, particularly the provision and patterning of services. For example, evidence indicates that while psychiatric problems are as prevalent among rural as urban youth (Kessler, et al., 1994; Rutter, et al., 1975; Zahner, et al., 1992), individuals in rural areas receive fewer mental health services than their urban counterparts (Cohen, et al., 1993; Goldsmith, et al., 1997; Offord, et al., 1987; Pottick, et al., 1992; Takeuchi, et al., 1993). Obstacles to services are common to most people with severe mental disorders, but some obstacles are more pronounced in rural areas, including geographical (distance and sparse population) and social (personal stigma, visibility and confidentiality) impediments, systemic problems of low population density (diseconomies of scale associated with a sparse population) and under-supported service systems (resource poor). Together these features have hindered the development of specialized public systems of care for dealing with people with mental illness in many rural areas.

Rather than there being a coordinated network of specialized mental health providers in local communities, the prevailing assumption is that a de facto system of care exists as described in a seminal paper by Regier and colleagues (1978). They argued that the typical mental health
system in U.S. communities consists of a fragmented assortment of service venues, and that individuals with psychiatric disorders typically obtain services in a variety of settings. Because rural areas face additional service obstacles, the image is that the provision of mental health care is even more loose knit than in urban areas and provided by other professionals or informally.

Service barriers occur for several reasons: They can be due to the environment (i.e., community acceptance or political will), the clients themselves (i.e., noncompliance, culture), or—often cited by providers—a lack of services coordination or services fragmentation (Bachrach, 1997; Calloway, et al., 1997; Ridgely, et al., 1990). Services coordination is problematic for consumers with serious mental illness at both the front door (i.e., knowing where, when and how to get services) and the back door (i.e., continuity of care and follow-up). Services coordination can be particularly problematic in de facto systems where, by their nature, services are delivered by providers across distinct sectors of care (i.e., primary and mental health care) that usually do not have a history of communication, due, in part, to separate funding and accountability structures. Given this environment, services coordination is required to get people into services and to acquire other support as needed.

This raises questions about the way care is structured (Note 1) in rural areas and the extent to which the management of care creates, perpetuates or, possibly, attenuates service barriers. For example, certain risk factors contributing to a lack of psychiatric care are known to be more prevalent in rural environments (e.g., poor follow-up, lack of appropriate technologies and case management services, and sparse gateways into services) (Fox, et al., 1995). However, the argument goes, to the extent that individual providers can coordinate services in the early stages of illness detection, the more aggressive outreach becomes, the more care has continuity and the better the outcomes (Breakey, 1996; Gruenberg, et al., 1970). The idea that the coordination of service providers can reduce risk factors and other service obstacles, thereby improving individual client outcomes, has led to substantial public and private dollars being spent on improving psychiatric care through systemwide efforts. These efforts, in fact, attempt to coordinate and integrate public mental health providers with other local providers of clinical and supportive services. To date, these initiatives have occurred almost exclusively in urban areas, and the structure of rural service systems and how it may attenuate service barriers in rural areas remains unexplored.

In sum, the number and type of social and environmental impediments facing the provision of care in rural systems seems formidable. Given the evidence that the structure of service systems is important to service receipt, the study of rural service system characteristics gains added importance. For example, certain system-level features (e.g., density, size and hierarchy) may help overcome, or at least ameliorate, other service barriers such as availability, accessibility and appropriateness. This paper attempts to fill this gap by first discussing a method that characterizes rural service systems, second, applying the method to data gathered in two rural catchment areas, and last, comparing the results with four urban systems to draw conclusions about how the rural structure resembles or differs from urban systems.

**Mental Health Service Systems in Rural Areas: A Conceptualization**

In this section, a method for characterizing rural systems of care is presented. As suggested, there are major policy and research interests associated with the task. An important one is the extent to which the unique structure of rural mental health services contributes to service barriers. If it does, then it may be possible to implement in rural areas findings from service system initiatives focusing on integration in urban areas (Randolph, 1995; Shore, et al., 1994). Given the prevalence of obstacles to care in rural communities, it would seem advantageous to emulate findings that enhance the coordination of mental health services in urban areas. A problem is whether barriers faced in rural areas are so fundamentally different—particularly the extent to which mental health providers depend on nonmental health agencies for services provision—as to make urban solutions untenable in rural areas. The authors were unaware of data or findings that address this question.

Investigating the structure of care to people with severe mental disorders in rural areas requires a method for comparing systems, one that accommodates system characteristics regardless of a site's location. This study proposed, therefore, to describe service systems by use of...
a continuum that is based on the extent of resource exchanges in addition to a community's geographic and demographic factors. While system environments differ along a continuum, there are a common set of roles or services provided within all systems of care that can be measured. In this way, rural and urban sites may be compared using a common standard: the patterning of resource exchanges among providers that constitute a system of care.

The conceptualization begins by defining the end points of the continuum. Creating idealized systems of care does this. One end is characterized by highly formalized systems—all resource exchanges necessary for providing a continuum of care involve only specialized mental health providers. Given the sheer number of mental health providers and the extent of their specialization, urban rather than rural systems are more likely to resemble this type. The other anchor is characterized by systems in which the provision of care takes place through only nonmental health organizations. Rural systems are more likely to resemble this type. For example, one could assume that in rural areas mental health services, such as crisis intervention, medication management and case management, are more likely provided by programs not under the auspices of a mental health provider (Wagenfeld, et al., 1997). The method employed in this study determined the extent to which mental health providers rely on other human service providers in different service sectors (i.e., substance abuse, health or housing), allowing a limited test of this hypothesis. Further, this method actually provided another way of measuring the extent to which mental health services were provided outside the specialty mental health sector without reliance on client-level service data and the accompanying problems (Regier, et al., 1978).

Social network methods and measures previously used to characterize and compare urban systems of care for people with severe mental disorders are employed to measure and characterize two rural systems delivering services to an identically defined population (Morrissey, et al., 1994). Data were examined to provide insight into the manner in which these systems of care were structured. Specifically, this study examined: (1) the types of agencies providing care to people with severe mental disorders in two rural catchment areas, and (2) the extent to which a system of care was clearly identified as involving primarily specialty mental health agencies or involved other service agencies (i.e., primary health care or human services). Last, this study compared the rural findings with results from a study of four urban areas to assess similarities and differences in the structuring of care, particularly their dependence on nonmental health providers.

The study tested two hypotheses. The first, which follows, dealt with the size and specialization of mental health providers in rural systems (Note 2).

Hypothesis 1: Because of the smaller population base to support the development of specialized services, the proportion of agencies that are specialty mental health agencies in an identified system of care is smaller in rural systems than those similarly identified in urban systems (Note 3).

A second hypothesis, and corollary, dealt with the organization and structure of care in rural systems.

Hypothesis 2: Rural mental health service systems for people with severe mental disorders are fundamentally different from urban systems in their structure of care; they are not just smaller versions of urban systems.

Hypothesis 2a: De facto service system features are more prevalent in rural areas where specialty mental health providers rely more on nonmental health agencies than their urban counterparts.

**Methods**

Although many policy-makers accept the notion that system characteristics affect the quality, accessibility and availability of services, the coordination of rural service providers and the extent of their integration is not well understood. This section describes the method used to characterize rural systems of care and the study sites where this research was conducted.

**Rural Study.** Case studies were carried out in two multicounty rural catchment areas in north central and eastern North Carolina. The first catchment area, referred to as Rural-1, consists of four counties and lies between the Virginia border and the larger urban counties of central North Carolina. The second, a three-county area, borders the Pamlico River and Pamlico Sound in the east and is referred to as Rural-2. The average 1990 population of the Rural-1 counties was approximately 32,700 (Department of Health and Human Services, 1990), and the average median family income in 1989 was $26,737; The percentage of those in poverty was 19 percent. The average 1990 population for Rural-2 was somewhat
smaller with approximately 27,100. The Rural-2 figures for percentage in poverty and median family income are similar to Rural-1: 21 percent and $26,000, respectively. Both catchment areas have relatively large but similar proportions of blacks, 44 percent and 41 percent for Rural-1 and Rural-2, respectively. The catchment areas differ somewhat in the extent to which they are characterized as remotely rural. This difference is demonstrated by the population densities. There are approximately 85 people per square mile in Rural-1 and 49 per square mile in Rural-2. Rural-2 is considerably farther from a metropolitan area, a state mental hospital and a university-based psychiatry department.

In the summer of 1994, a broad-based network of organizations that provide services to people with severe mental disorders in these rural areas was identified. The methodology used is known as network bounding (Laumann, et al., 1983) and involves identifying and interviewing local people knowledgeable about mental health issues in their county. After these individuals were identified, they were interviewed and asked to list all organizations that provide clinical or supportive services to people with severe mental disorders along with the names of individuals from each who best understand their organization’s role in the service system (Doreian, et al., 1992). Once the key informants decided that all relevant organizations were identified, the process ended, and a network list of organizations was developed for the two areas.

Key staff of each area’s public mental health, developmental disabilities and substance abuse programs served as initial contacts. When the process ended, 83 agencies and associated staff across four counties were identified as providing services to people with severe mental disorders in Rural-1, and 48 organizations and staff were identified across three counties in Rural-2. The identification of a sizable number of service providers (approximately 20 per county) in the two catchment areas suggests the potential existence of a specialized system of care for people with severe psychiatric disorders. The question of interest was the extent to which the coordination of services involved specialized mental health agencies, or conversely, included mostly nonmental health agencies.

Urban Study. The urban systems of care were studied as part of an evaluation of the Robert Wood Johnson Foundation’s Program on Chronic Mental Illness. The methods and strategies of data collection and analyses provided the framework used in this study (Goldman, et al., 1990; Goldman, et al., 1992). Interorganizational network data were collected in several large urban metropolitan areas in 1989 and 1991, including Cincinnati, Toledo and Columbus, Ohio, and Baltimore, Md. In both the urban and rural studies, the data collected (interorganizational exchanges of important resources), the stimulus questions used, the network bounding and the data collection process were similar, making the studies comparable even though the systems are in very different environments.

In the urban areas, key personnel from the local mental health authorities and staff associated with the local Robert Wood Johnson program served as key informants. After the provider enumeration ended, the final count of organizations in each urban area was: Cincinnati (64), Toledo (38), Columbus (44) and Baltimore (48).

Final lists of organizations in both the rural and urban networks included a host of similar service providers that serve a broader range of clients than seen by specialized mental health organizations. For example, housing, law enforcement, entitlements, substance abuse, medical and dental, vocational, educational and basic human needs organizations were identified in each. However, as the first hypothesis anticipated, the percentage of network organizations identified as specialized mental health agencies is larger in urban areas. In total, 67 percent of urban and 30 percent of rural organizations identified were either a mental health agency or a subprogram within a mental health organization (Note 4).

To characterize the structure of the care systems in both rural and urban networks, the resource exchanges between the identified service providers were measured. The following question was asked as part of an in-person interview in both the rural and urban sites.

To what extent do you share information with this other organization for the purpose of services coordination, planning or evaluation purposes as it pertains to clients with a severe mental illness?

The information linkages assessed the extent of coordination and planning of services for people with severe mental disorders. Responses were recorded on a 0 to 4 Likert scale where 0 is “not at all” and 4 is “a lot.” Individuals from each organization provided responses describing the level of their organization’s information sharing with all others identified in the service network. A common definition of severe mental disorder was used across the rural and urban sites (Note 5).

To determine the extent to which the services coordination and planning activities involve nonmental health vs. specialized mental health providers, each organization in the network was assigned to one of two groups. One group contains providers serving primarily people
with severe mental disorders, and the second contains those who serve a much broader range of clients. Hence, group membership was based on the extent to which the organization's clientele were primarily people with severe mental disorders. Two questions were used to determine their placement.

1. What is the percentage of your clientele that have a mental illness?
2. What percentage of these clients [just identified] with a mental illness have a severe mental disorder?

The distribution of responses for the percentage with mental illness question was tri-modal, with the 1 percent, 50 percent and 100 percent categories having the highest number of cases. For the percentage severe mental disorder question, the zero, 5 percent, 10 percent, 50 percent and 100 percent categories had the highest frequencies. On both questions, there appears to be a clear distinction between those agencies that do and do not serve this population almost exclusively. For example, approximately one-half of the responses were below the 50 percent category on the question of percentage with mental illness (most below 10 percent), and one-half of responses were below the 25 percent category for the severe mental disorder question (again most below the 10 percent level). While cut-point decisions are problematic, the 50 percent or more with mental illness and 25 percent or more with severe mental disorder was chosen for separating the service providers. This conservative approach allowed organizations to be placed within the specialty mental health group only if a very large portion of its clientele had severe mental illness.

Of particular interest were organizations in the group serving primarily people with a severe mental disorder. As operationalized, these organizations had 50 percent or more of their clients presenting mental illness and 25 percent or more having chronic and severe mental disorders. The percentage of organizations that are specialized mental health providers in both rural systems are 27 percent and 31 percent. This group of providers is referred to as severe mental disorder (SMD) service providers. The providers (i.e., hospitals, law enforcement and social entitlement agencies) in the other group, while they do serve clients with mental illness, provide services mostly to clients who do not have mental illness.

By using data that both deal with information exchanges for service planning and the information linkages for services coordination, the structure of service provision involving mental health and other service providers in rural catchment areas, as well as urban systems, can be determined. In short, by classifying the service providers in each site and by examining their linkages for coordinating care to people with severe mental disorders, each site can be accessed as to the degree to which a de facto system of care exists. Further, it then becomes possible to compare rural and urban sites in this regard. This research design is illustrated in Figure 1.

**Data**

The service linkages provided frequency counts within and across agencies in the two types of service groups that were called "other" and "SMD service providers." It is noted that if SMD and other service providers were primarily exchanging case-planning information with SMD providers (cells A and C in Figure 1), then there is evidence that local specialized mental health organizations were principally involved with coordinating care. If, on the other hand, a relatively large number of exchanges occurred in cells B and D (Figure 1) there is evidence of a de facto system of care at that site.

Further, to determine similarities or differences between urban and rural systems, the rural findings were compared with the four urban areas that participated in the Robert Wood Johnson program. While the systems of care differed slightly in terms of the types and sizes of organizations involved, the organizational roles or functions included (i.e., mental health, housing, primary care, entitlements, etc.) were similar.

**Findings**

**Rural Service Delivery Systems.** Table 1 lists the number and percentage of information linkages between SMD and other service providers, as it pertained to peo-
people with severe mental disorders, in the two rural areas. While there were more interorganizational relationships within Rural-1 (due to the larger number of organizations), the proportion of relationships among and between the two types of service providers was quite similar. Looking at the cell percentages in both rural areas, more than one-half of the exchanges involved other service providers who reported receiving a lot of information from SMD providers (63 percent and 64 percent of the confirmed information linkages from SMD providers involved Other service providers in Rural-1 and Rural-2 areas, respectively). In fact, in both areas, the number of information linkages between the other and SMD service providers was nearly twice as many as the within SMD provider group. Table 1 also reveals that the frequency of information exchanges across these provider groups was similar, with the largest percentage difference being 5 percent (41 percent to 36 percent and 64 percent to 59 percent) within the other service provider row counts. As hypothesized, both rural sites showed numerous services coordination linkages between the two types of provider groups for service planning and delivery, i.e., *de facto* like structure.

To determine whether these differences represented a similar structuring or patterning of services coordination, cell counts were adjusted for the known distribution (number) of organizations in each provider group (Iacobucci, 1994). This size adjustment was made in light of literature showing that the best predictor of collective action is group size (Spilerman, 1970). This procedure is commonly used in multivariate analyses involving uneven cell counts. Each cell was adjusted by dividing the actual number of relationships that existed by the total possible number of relationships (a function of the number of organizations in a cell). This is actually a density measure and often is used to compare network structures (Burt, et al., 1983; Wasserman, et al., 1994). That is, the interest is in both the sheer numbers of relationships and the number of actual to possible relationships. The frequency of relationships is the activity needed to provide care. The actual to possible relationships is the extent to which that activity targets particular providers (i.e., mental health and nonmental health). Each reveals a distinct picture of services coordination as measured across a known distribution of providers.

Taking the Rural-2 counts as an example, Table 2 shows that the total possible number of relationships within the SMD provider group is 182 (14 X 13) (Note 6) because 14 of 43 organizations are in the SMD provider group (Note 7). Likewise, for the SMD to other service providers and the other to SMD service providers groups, the total number of possible relationships is 406 (14 X 29) because 29 organizations are in the other service provider group. Finally, for the other to other service providers, the number is 812 (28 X 29). Using these adjusted organizations by group numbers for Rural-1, cell counts of 462, 1,254, 1,254, and 3,192 are obtained (denominators in the first row of Table 2) (Note 8).
In Table 2, the structure characterized by linkage densities looks different from the cell frequencies in Table 1, where, of all the service information linkages across organizations, only a small percentage occurred within the SMD provider group. However, when viewing density scores (Table 2), most of the potential communications between SMD providers actually occurred, and that cell provides the largest percentage. Similarly, the large percentages associated with relationships involving organizations in the other service provider group in Table 1 are dramatically smaller in Table 2, particularly those within the other service provider group in Rural-1, now at 19 percent. Unlike Table 1 where the distribution of relationships is similar across the two groups, their structure appears very different. For example, more of the possible exchange relationships actually occur in the Rural-2 site. In the Rural-2 site, 43 percent of the possible relationships exist, compared with only 26 percent in Rural-1. In fact, down every column in Table 2, the percentage of actual to possible relationships is larger in Rural-2, particularly the cells showing the between-group relationships (52 percent and 45 percent vs. 33 percent and 22 percent for Rural-2 and Rural-1, respectively). Interestingly, in Rural-2, almost one in two possible relationships existed between the provider groups and one in three in Rural-1, indicating a greater dependence on the full set of identified other service providers for coordinating care to people with severe mental disorders. However, the dependence was not just with the other providers but also related to the SMD group. The findings in Table 2 indicate that the Rural-2 site must take particular advantage of all possible providers (probably the result of being the smaller and more remotely rural), but that both rural sites particularly take advantage of the services of the organizations in the SMD provider group.

Urban Service Delivery Systems. While it appeared that there were a substantial number of linkages involving other service providers participating in service coordination in the rural sites, even when controlling for the potential number of partners (e.g., opportunity), it was uncertain what this means. It is a figure to ground problem where the findings require a comparison. While this study lacked other rural sites with which to compare these findings, these patterns could be compared with the four urban Robert Wood Johnson program sites. The comparisons would demonstrate whether these rural sites had a different structure in their service relationships than urban sites by examining the density scores as demonstrated.

| Table 3. Information Exchanges Among and Between Severe Mental Disorder (SMD) Service Providers and Other Service Providers for People With SMDs in Two Rural and Four Urban Sites (Percentages Based on Row Marginals). |
|----------------|----------------|----------------|----------------|----------------|
|                 | SMD to SMD Providers | SMD to Other Service Providers | Other Service Providers to SMD Providers | Other Service Providers to Other Service Providers |
| Two Rural Sites | 364 (15%)          | 619 (26%)        | 525 (22%)      | 873 (37%)      | 2,381 (100%)  |
| Four Urban Sites| 1,240 (53%)        | 449 (19%)        | 402 (17%)      | 239 (10%)      | 2,330 (100%)  |

Table 3 provides the sheer number of confirmed information linkages and their distribution within and between the two service groups for both the urban and rural sites. For example, the 15 percent (first row and column cell) is the within-SMD group percentage for the two rural sites, which is 364 (the sum of linkages from Table 2: 244+120) divided by the total number of confirmed linkages in the rural areas, or 2,381 (the marginal totals in Table 2). That is, of all confirmed service ties in the two rural areas, 15 percent were within the SMD group. Looking at the frequency of relationships and their distributions within and between provider groups, it appeared that urban and rural systems differed in the number of service relationships involving non-SMD providers. The cell counts in Table 3 indicate that a more de facto system of care exists in rural systems. In urban systems, the other service providers were involved in fewer service coordination linkages than SMD providers. In the urban areas, 53 percent of all the confirmed exchange relationships were within the SMD provider group, compared with only 15 percent in the rural areas. Conversely, 37 percent of the exchange relationships occurred within the other service provider group in the rural areas compared with only 10 percent for the urban areas.

Adjusting the data in Table 3 by the number of possible ties provided a way to evaluate structural differences in service systems in the rural and urban sites. These density scores revealed the extent of service
dependency when providers coordinated care to people with SMDs within rural sites as compared with urban sites. In the urban sites, the total number of SMD providers was 119 and the total number of other service providers was 59, for a total of 178 organizations. Given these distributions, appropriate densities were calculated and are provided in Table 4.

The first row of Table 4 provides the densities among and between the provider groups in the two rural sites, and the second row provides the urban equivalent. When the data are arranged this way the structure of services coordination can be more easily compared. Taking the first cell in row and column one—the rural linkages—364 of 644 possible linkages (57 percent) occurred between providers in the SMD provider group, while that percentage for the urban systems (row two, column one) is 32 percent. Comparing the findings in column four (within the other service provider group), the structuring of linkages in the rural and urban areas is similar: 22 percent and 25 percent, respectively. Further, when comparing the between group percentages, more than one-third of the possible between group relationships occur in rural areas, while the percentage in urban areas is slightly less (approximately 27 percent). In short, rural areas have a lot of service information exchanges occurring among and within the other service provider group, but somewhat surprisingly, the distribution of those actual linkages across possible providers is similar to those in the urban areas.

Table 4. Information Exchange Among and Between Severe Mental Disorder (SMD) Service Providers and Other Service Providers for People With SMDs in Two Rural and Four Urban Sites, Adjusted by Total Possible Ties.

<table>
<thead>
<tr>
<th></th>
<th>Rural Catchment Areas</th>
<th>Rural-2 Catchment Area</th>
<th>Cincinnati, Ohio Service System</th>
<th>Toledo, Ohio Service System</th>
<th>Columbus, Ohio Service System</th>
<th>Baltimore, Md. Service System</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(244/462)</td>
<td>(120/182)</td>
<td>(426/1,190)</td>
<td>(67/156)</td>
<td>(367/812)</td>
<td>(380/1,722)</td>
</tr>
<tr>
<td>Percent of Possible Ties (N/Possible N)</td>
<td>53%</td>
<td>66%</td>
<td>36%</td>
<td>43%</td>
<td>45%</td>
<td>22%</td>
</tr>
<tr>
<td>Other SMD Service Providers to Other Services Providers</td>
<td>(408/1,254)</td>
<td>(21/406)</td>
<td>(156/525)</td>
<td>(70/299)</td>
<td>(159/525)</td>
<td>(64/252)</td>
</tr>
<tr>
<td>Other SMD Service Providers to Other Sh4D Service Providers</td>
<td>(343/1,254)</td>
<td>(182/406)</td>
<td>(158/525)</td>
<td>(72/299)</td>
<td>(158/525)</td>
<td>(35/252)</td>
</tr>
<tr>
<td>Other Sh4D Service Providers to Other Services Providers</td>
<td>(615/3,192)</td>
<td>(258/812)</td>
<td>(68/210)</td>
<td>(79/506)</td>
<td>(84/210)</td>
<td>(8/30)</td>
</tr>
</tbody>
</table>

Table 5. Information Exchanges Among and Between Severe Mental Disorder (SMD) Service Providers and Other Service Providers for SMDs in Two Rural Catchment Areas and Four Urban Systems.

<table>
<thead>
<tr>
<th></th>
<th>Rural Catchment Area</th>
<th>Rural-2 Catchment Area</th>
<th>Cincinnati, Ohio Service System</th>
<th>Toledo, Ohio Service System</th>
<th>Columbus, Ohio Service System</th>
<th>Baltimore, Md. Service System</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(244/462)</td>
<td>(120/182)</td>
<td>(426/1,190)</td>
<td>(67/156)</td>
<td>(367/812)</td>
<td>(380/1,722)</td>
</tr>
<tr>
<td>Percent of Possible Ties (N/Possible N)</td>
<td>53%</td>
<td>66%</td>
<td>36%</td>
<td>43%</td>
<td>45%</td>
<td>22%</td>
</tr>
<tr>
<td>Other SMD Service Providers to Other Services Providers</td>
<td>(408/1,254)</td>
<td>(21/406)</td>
<td>(156/525)</td>
<td>(70/299)</td>
<td>(159/525)</td>
<td>(64/252)</td>
</tr>
<tr>
<td>Other SMD Service Providers to Other Sh4D Service Providers</td>
<td>(343/1,254)</td>
<td>(182/406)</td>
<td>(158/525)</td>
<td>(72/299)</td>
<td>(158/525)</td>
<td>(35/252)</td>
</tr>
<tr>
<td>Other Sh4D Service Providers to Other Services Providers</td>
<td>(615/3,192)</td>
<td>(258/812)</td>
<td>(68/210)</td>
<td>(79/506)</td>
<td>(84/210)</td>
<td>(8/30)</td>
</tr>
</tbody>
</table>
The initiation of exchanges and the rural-urban factors are treated as fixed effects, while the location factor is considered random. That is, the rural and urban sites are assumed to be samples drawn from a hypothetical population of such systems. When all possible effects are separated, 11 sources of variation become distinguishable and are labeled as: (1) UR, (2) LOC[UR], (3) BW, (4) UR*BW, (5) LOC*BW[UR], (6) LR, (7) LR*UR, (8) LOC*LR[UR], (9) BW*LR, (10) UB*BW*LR, and (11) LOC*BW*LR[UR]. The asterisk denotes an interaction term, and the brackets denote nesting of sites within the UR dichotomy where the fixed effects are treated as interactions and the random effects (i.e., LOC) are nested.

Deciding which effects of a complex analysis of variance are nonzero is a delicate inferential issue, but in this case, the results separate into systematic and error effects quite distinctly. The main effects of UR and LR, plus the two-way interactions of UR*LR and BW*LR, and the UR*BW*LR interactions are all significant. The findings are summarized below:

1. Organizations categorized as SMD providers have more connections among themselves than with organizations categorized as other providers.
2. The SMD provider vs. other provider initiated exchanges difference is higher in rural than in urban areas.
3. The SMD vs. other initiated difference is particularly accentuated in rural areas. That is, there is an interaction effect associated with the rural sites. The possible information exchanges around the coordination of care involving the SMD provider group, are particularly intense in rural areas.

**Discussion**

Regier and colleagues (1978) referred to the mental health service systems in the United States as de facto, and supporting literature in a rural context describe additional and uniquely rural obstacles to care that suggest that rural systems are even more de facto. The organization of
care is an important independent variable in explaining service accessibility and availability—one that particularly needs to be explored in a rural context. By viewing rural and urban systems of care as distributed on an idealized continuum that reflects the everyday structure of care of people with SMDs, this study compared two rural and four urban sites in terms of their information sharing for coordinating and planning of care. The hypothesis at the outset was that given the unique nature of rural environments, the structure of their systems of care for people with SMDs would be fundamentally different from urban systems. This study hypothesized that urban systems are more specialized, with urban mental health providers being much less dependent upon nonmental health service providers for coordinating care to people with SMDs than their rural counterparts.

The findings suggest that, as hypothesized, the scale of specialized mental health services providers is smaller in rural areas. The finding that rural areas are underserved in this regard is neither new nor surprising. On the other hand, the analysis showed that the actual relationships involving a continuum of care for people with an SMD in urban systems involve more specialized mental health providers. This is true even though the total percentage of possible to actual relationships are identical in both rural and urban sites (30 percent, Table 4). However, a second hypothesis, that the structure of care would be different, also was confirmed, but not exactly in the way anticipated. The structural differences around service coordination for the SMD population between the rural and urban sites were not as great in their between-group interactions (as expected) as in their within-group relationships. Rural systems here are not exactly smaller versions of urban systems. The largest difference is the within-SMD provider group, where rural areas have a larger number of actualized relationships suggesting that there is a heavier reliance on other mental health providers. Care for this population requires a heavier focus of activity between mental health providers in rural areas. This may be explained, in part, by the catchment arrangements in urban areas where duplicate organizations need not coordinate across catchment areas, but this situation also is present in these rural areas (i.e., across county linkages).

The three significant findings emerging from this analysis involve rural-urban differences and are directly germane to the stated hypotheses. First, the urban-rural main effect indicates that service relationships between all specialized mental health providers (SMD provider group) are more likely to occur in rural than in urban areas. Rural agencies cannot be as discriminating about their linkages when it comes to people with SMDs. Many of the relationships are actually intra-organizational linkages due to the public mental health center being the only game in town. This may be due to the paucity of specialized mental health organizations in rural areas (thus having fewer possible partners) as well as to the fact that service coordination needs are so pronounced in rural relative to urban areas.

Second, the significant effects associated with which provider initiated the exchange, points to a higher percentage of possible relationships initiated by SMD providers than by other providers. Third, and possibly the most interesting, is the significant effect associated with the interaction of which organization initiated the relationship and the rural-urban factor. It appears that rural SMD providers initiate more relationships and take advantage of other mental health providers than their urban counterparts. This, coupled with the nonsignificant differences between rural and urban sites in terms of the interactions involving nonmental health providers sheds additional insight into the de facto hypothesis. While there appears to be substantial nonmental health and equally de facto-like reliance in both rural and urban areas, as Regier and colleagues noted (1978), the two actually have a different structure in services coordination based on opportunity.

While rural-urban differences are important to understand, they are not easily explained. It may be organizational features (i.e., smaller size both in personnel and resources), that create dependency in rural areas and tendencies to initiate relationships with any resource available, or even leadership factors. In retrospect, the finding of more dependence among rural SMD providers may not be that surprising. There are rural factors that constrain relationships to be handled internally among mental health providers, such as findings that rural mental health centers are more family-like than urban centers (Eisenhart, et al., 1983), as opposed to externally focused where they can be scrutinized and stigmatized by the community (Hoyt, et al., 1997). The findings here point to a different structure in care provision between rural and urban sites, but it is premature to suggest that obstacles to care in rural mental health systems are due to the structuring of services. As a result, the findings from urban demonstrations concerning the emphasis on inter-sectoral relationships may have significant implications for rural mental health directors, but they must take into account unique rural features of services coordination. These results await further work in comparing the rural and urban systems of care for people with severe psychiatric disorders, but it can be argued that the method proposed
in this paper—of basing analyses on the relationships among organizations—appears promising. Future work would continue to stress the need for attending to the diversity of rural populations and finding those factors that are truly rural that should be remedied or enhanced in providing a continuum of care for people with SMDs.

Notes

1. Structure refers to not only the availability of a set of services but also the extent to which the service providers are linked or coordinated to provide a network of care.
2. While not stated directly in the hypothesis, size differences between mental health rural and urban systems encompass specialization. That is, urban mental health agencies are more likely to provide multiple services (for example, a mental health organization providing a substance abuse treatment program). Specialization results in fewer nonmental health agencies used to provide services to this population.
3. Inclusion in the lists for both studies was based on the Community Support Program criteria developed by the National Institute of Mental Health (Turner, et al., 1978)
4. In the case of multi-program service providers (i.e., local mental health centers), each of their programs dealing with people with severe mental disorders were treated separately on the organizational lists because they provide unique services and relate with other service providers in different ways.
5. The definition used for serious mental disorder was: people with severe mental disorders exhibit a major mental disorder characterized by severity, persistence of disability and dependency of indefinite duration. Their capacity to function in such primary aspects of life as self-care, interpersonal relationships, work or schooling has been severely impaired for at least one year.
6. The formula is \( N \times N - 1 \) because an organization's relationship with itself is undefined. Looking at Figure 1, the N-1 formula is used in cells A and D.
7. The base number of 43 was used instead of 48 because of missing data on five organizations concerning the type of population served because they could not be classified. Also, one SMD organization did not respond. Hence, the total number of SMD providers is 14.
8. Two organizations had missing data on the types of clients served, and two did not respond to the interorganizational survey; so the base number in Rural-1 is 79 rather than 83, of which 22 are SMD providers.

References


