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IN THE GREAT PLAINS: A REPORT OF THE

NC-102 TECHNICAL RESEARCH COMMITTEE

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Eleven hundred sixty-seven randomly selected households in four Great Plains states¹ were interviewed in 1975 and 1976 as a part of the community services research activities of the NC-102 Technical Research Committee. Each household interviewed was asked to respond to a series of questions about the source(s), use, cost, and perceptions of seven community services: water supply, sewage disposal, solid waste disposal, fire protection, law enforcement, education, and health care. Restrictions of time and space make it not feasible to report fully on the research effort, so only selected highlights will be reported here. A complete report is forthcoming as Great Plains Agricultural Council Publication No. 83, Volume I.

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¹ The participating states were North Dakota, South Dakota, Nebraska, and Texas.

In this brief report, we start by identifying the objectives of the survey and two propositions about community services that were major determinants of the design of the research effort. The survey design is briefly described and responses are summarized. The paper concludes with a discussion of implications drawn from the research.

Objectives of the Survey

The survey was undertaken as the Technical Research Committee's attempt to reconcile widely accepted conclusions about services inadequacy in non-metropolitan areas [5,13], and the not unfavorable opinions of community services expressed by citizens contacted through research or extension work in committee members' respective states. Citizen concern over services appeared to be much less than that which would be expected if services were perceived as inadequate. As economists, the authors believed that individual citizen's perceptions should be a part of the information base for decision making about community services.

This survey was an effort by the Technical Research Committee members to determine for reasonably typical Great Plains counties: (1) the availability and use of selected community services and (2) perceptions of the need for modification of those services or service delivery systems. More specifically, the objectives of the survey were:

1. To identify sample households' source(s) and the extent of their use of the selected services.
2. To enumerate respondents' perception of problems associated with those services.
3. To establish the extent to which respondents felt the return on money spent for those services was adequate.

In recognition of the variability of the Great Plains and the ways in which many of its social, economic and political attributes are influenced by the location and density of the population, the survey design reflected two implicit propositions about community services:

Proposition I. The availability, use by consumers, and user perceptions of community services are functionally related to the presence or absence, and type, of trade center in a county.

Proposition II. Within any county, the availability, use by consumers, cost, and user perceptions of community services are functionally related to user's municipal or open country site of residence.

The framework for analysis of responses in the 1167 interviews reported on here also reflects these implicit propositions about consumers' reactions to community services.

The Survey Design

In each of the participating states a county was selected as:

1. A Full Service County--a county containing a regional trade center with a full range of agricultural support businesses, several types of manufacturing activities, a full range of retail businesses, plus the normal complement of local government and quasi-public services. The trade center serves a region larger than the county. Agriculture provides the primary economic base of the region. Residents can secure most goods and services from within the county.
2. A Partial Service County--a county containing a county seat trade center as the only municipality with significant commercial

activity. The trade center has agriculturally related commercial activity, local government operations and retail trade as primary employment sources. Agriculture provides the primary economic base of the county. Residents regularly travel to regional trade centers outside the county to secure some types of goods and services.

3. A Limited Service County--a county of low population density with extensive agriculture as the primary economic base and no trade center municipality. Residents travel to trade centers outside the county to secure most of the goods and services they utilize.

These criteria were selected to provide replications of respondent perceptions of services in three types of counties typical of much of the Great Plains. The regional trade center in the Full Service County was excluded from the sampling frame. All other municipal households and all open country households in the sample counties were on the sampling frame. Households to be interviewed were randomly selected within the municipal and open country strata of each county using sample allocations appropriate to the characteristics of the counties. The number of interviews completed is reported in Table 1.

Open country population densities in the sample counties (1970 Census of Population data) ranged from 0.3 to 5.8 per square kilometer (0.8 to 15.0 per square mile). The regional trade centers had between 13,000 and 21,000 population. The county seat trade centers had between 2500 and 6500 population.

Table 1. Respondent Households by Type of County, Site of Residence, and State

Type of County	Site of Residence	Neb.	N.D.	S.D.	Texas	Total
Full Service	Municipal	64	35	34	34	167
	Open Country	72	35	71	35	213
Partial Service	Municipal	67	35	62	93	257
	Open Country	69	35	48	92	244
Limited Service	Municipal	18	35	16	32	101
	Open Country	117	35	19	14	185
3-County Total	Municipal	149	105	112	159	525
	Open Country	258	105	138	141	642
STATE TOTAL		407	210	250	300	1167

Summary of Responses

The overall patterns of responses to the sequences of questions related to seven services are summarized and reported here. The organization of the presentation reflects the two implicit propositions about community services: (1) The availability and use of services, and user perceptions of community services are functionally related to the presence or absence, and the type, of trade center in a county. (2) Within any county, the availability, the use of services, the cost of services, and user perceptions of community services are functionally related to user's municipal or open country site of residence.

Analysis of responses disclosed limited evidence that the first of these propositions was valid for counties in the domain of the study (Table 2). Responses to questions about the three utilities (water supply, sewage disposal, solid waste disposal), indicated little or no differences

Table 2. Effects of County Type and Site of Residence on Survey Responses, by service

Effects of County Type On:	Water Supply	Sewage Disposal	Solid Waste Disposal
Availability or Use of Service	No difference by county type	FSC Municipal reported private systems with greater relative frequency than PSC or LSC (19% vs 8%)	FSC-PSC no difference. LSC municipal proportion of respondent hauled twice as large as FSC & PSC (22% vs 9%)
Respondent's Perceptions of:			
Priority Problem	No difference by county type	No difference by county type	No difference by county type
Willingness to Incur Additional Cost to Eliminate Problem	No difference by county type	No difference by county type	No difference by county type
Satisfied With Return On Service Costs?	No difference by county type	No difference by county type	No difference by county type
Effects of Site of Residence On:			
Availability of service	Mun: 91% public supply system Q.C.: 95% private sources of supply	Mun: 88% use municipal disposal system Q.C.: 99% use private disposal system	Mun: 89% municipal or commercial pick up Q.C.: 91% respondent hauled
Use of Service	All use water Mun: 7% report inadequate supply Q.C.: 8% report inadequate supply	All report sewage disposal Mun: 3% report inadequate capacity Q.C.: 10% report inadequate capacity	All report using a means of solid waste disposal
Cost of Service	Mun: Estimates from monthly bill mostly in \$0-\$10 range Q.C.: Unable to estimate	No reliable cost estimates Mun: 75% provided non-zero estimates, most were minimal cost Q.C.: 73% "No Estimate." Reported costs minimal	Mun: Estimated from monthly bill minimal Q.C.: Estimated from travel for hauling solid waste-minimal
Respondent's Perceptions of:			
Priority Problems	Mun: 246 identified a priority problem Q.C.: 278 identified a priority problem Slight differences Mun. vs Q.C.	Mun: 136 identified a priority problem Q.C.: 200 identified a priority problem-many were septic system prob's	Mun: 157 identified a priority problem Q.C.: 96 identified a priority problem Problems were related to disposal method
Willingness to Incur Additional Cost to Eliminate Problem	Mun: 89 would pay extra Q.C.: 121 would pay extra Slight differences Mun. vs Q.C.	Mun: 54 would pay extra Q.C.: 79 would pay extra-many were septic system prob's	Mun: 47 would pay extra Q.C.: 28 would pay extra Pattern of responses similar
Satisfied With Return On Service Costs?	Mun: 94 percent "Yes" Q.C.: 93 percent "Yes"	Mun: 93 percent "Yes" Q.C.: 93 percent "Yes"	Mun: 85 percent "Yes" Q.C.: 91 percent "Yes"

^aFSC is the abbreviation for Full Services Counties (N=380).

PSC is the abbreviation for Partial Services County (N=501).

LSC is the abbreviation for Limited Services County (N=286).

^bMun. is the abbreviation for municipal site of residence (N=525).

O.C. is the abbreviation for open country site of residence (N=642).

Table 2. Continued

Fire Protection	Law Enforcement	Education	Health Care
FSC has highest proportion served by organized department. (FSC = 85%, PSC = 80%, LSC = 78%)	PSC has highest proportion reporting availability of each type of LE assistance. All counties have 95% reporting LE available on call. 21% requested assistance in last 3 years	Distances traveled to secure educational services were greatest in LSC. Between state differences were evident	LSC had greatest average travel distance for most types of H.C. services. LSC & PSC travel distance greater than FSC for specialists. No differences in frequency of use
LSC had more problems than FSC or PSC	LSC had higher proportion of distance related problems	Differences by county type by state. No overall consistent pattern of differences	No consistent differences by county type
LSC had more willing to pay extra	LSC had higher proportion willing to pay extra	Differences by county type by state. No overall consistent pattern of differences	No difference by county type
No difference by county type	No difference by county type	LSC had higher private costs for post high school but responses indicated no differences by county type	LSC had non-medical costs > PSC which were > FSC, but responses indicated no difference by county type
No difference by site of residence	Mun: 66% report patrol past property. 97% report available on call O.C.: 29% report patrol past property. 97% report available on call	O.C. respondents averaged greater travel to secure k-12 educational services	O.C. respondents averaged greater travel distances to secure most services
Mun: Fire calls by 34 respondents (6%) O.C.: Fire calls by 96 respondents (15%)	Mun: 126 (24%) requested assistance in last 3 years O.C.: 116 (18%) requested assistance in last 3 years	Mun: 206 households (39%) had members enrolled O.C.: 310 households (47%) had members enrolled	No consistent Mun-O.C. differences. Most respondents reported use of at least one H.C. service
No cost of service estimates. Open country losses greater than municipal losses per fire & in total (based on 79 estimates)	No cost estimates requested	A greater proportion of O.C. households incurred high levels of private costs than Mun. households for K-12 education. No difference in post high school costs	Total non-medical costs averaged slightly higher for O.C. than for Mun. 2% of Mun. & 4% of O.C. had non-medical costs > \$1000/year
Mun: 53 identified a priority problem O.C.: 120 identified a priority problem-most related to distance or water supply	Mun: 127 identified a priority problem O.C.: 114 identified a priority problem O.C. law violations > Mun.; Mun. Svc. inadequacies > O.C.	Mun: 265 identified a priority problem O.C.: 328 identified a priority problem	Mun: 165 identified a priority problem O.C.: 212 identified a priority problem
Mun: 27 would pay extra O.C.: 51 would pay extra-many problems have no feasible solution	Mun: 59 would pay extra O.C.: 58 would pay extra	Mun: 117 would pay extra O.C.: 93 would pay extra	Mun: 41 would pay extra O.C.: 34 would pay extra
Mun: 92 percent "Yes" O.C.: 88 percent "Yes"	Mun: 84 percent "Yes" O.C.: 78 percent "Yes"	Mun: 66 percent "Yes" O.C.: 67 percent "Yes"	Mun: 83 percent "Yes" O.C.: 78 percent "Yes"

in the patterns of responses that were attributable to the type of county. Each of these is a service for which relatively low cost private means of supplying the service are available to individual households not served by the public sector. Thus, the type of trade center, or absence of a trade center, was not a determinant of utility availability and use, or of user perceptions of the service.

Responses related to fire protection were similar to those for the utilities though an identifiable relationship between county type and proportion of respondents served by an organized fire department was revealed. About one-fifth of all respondents were not served by any type of organized fire department. Respondents in Limited Services counties reported more distance-related problems with fire protection than did the residents of the other types of counties, and also indicated greater willingness to pay an extra amount to eliminate priority fire protection problems.

Law enforcement, education, and health care are each provided through organizational structures that are, in that order, progressively more hierarchical in nature. For each service, problems at least partially attributable to distance, and, for education and health care, higher private costs of securing services were reported by respondents in the Limited Services Counties. Other problems were identified by varying proportions of state or county samples, but no consistent patterns of other problems attributable to type of county was identified. No county type related differences in perceptions of the return for money spent on these services was identifiable.

Analysis of responses with respect to the second proposition--that within any county, the availability, the use of services, the cost of services, and user perceptions of community services are functionally related to user's municipal or open country site of residence--provided a mixed pattern of evidence regarding the validity of the proposition.

In the case of the three utilities, most municipal respondents secured these services from public or commercial sources. Most open country respondents secured them from private (self-owned) sources. Problems of inadequate supply or inadequate system capacity were identified by both municipal and open country respondents. Open country respondents were unable to estimate service costs, while municipal respondents provided estimates based on monthly (or other time period) bills. There were no important differences by site of residence in the proportion of respondents indicating satisfaction with the return from money spent on utilities. Many respondents identified problems with utilities and one-third to one-half of them indicated a willingness to pay an additional amount to eliminate their priority problems. When asked how much they would pay, most indicated nominal amounts. Other than differences in the source from which services are secured, there was little variation in responses that was attributable to site of residence.

Fire protection and law enforcement services are supplied from specific locations, and users are subject to distance-related barriers to use of the service. Open country respondents reported having experienced proportionately more fires and greater losses per fire than municipal residents. They also reported more priority problems (most were related to distance factors or water supply inadequacies), but there was little

municipal-open country difference in the proportion indicating the return on fire protection costs was adequate.

Law enforcement services were identified as being more consistently available to municipal respondents though the municipal and open country percentages of respondents indicating "available on call" were equal. Slightly more municipal than open country households had requested law enforcement assistance. Eighty-five percent of municipal and 83 percent of open country respondents who requested assistance said they were satisfied with the service they received. Priority law enforcement problems identified by ~~municipal~~ respondents had a higher proportion of law violations than was the case for ~~open country~~ respondents. The ~~open country~~ sample was much more conscious of service inadequacies (unequal enforcement, problem personnel, lack of personnel, etc.) than were those in the ~~open country~~ ~~municipal~~ sample. Forty-nine percent of those who identified a priority problem were willing to pay an additional amount for its elimination--the highest percentage of the seven services examined in the survey (the next highest was fire protection with 45 percent). There were only slight differences in this percentage for the municipal and open country subsamples. A higher proportion of municipal respondents (84 percent) approved of the return on their law enforcement costs than was the case for the open country sub-sample (78 percent).

Interaction between the hierarchical structures through which education and health care services are provided and municipal or open country site of residence of respondents produced response patterns somewhat supportive of the second proposition. The proportion of households with

members enrolled in school was higher for the open country subsample as were average private costs of securing educational services kindergarten through high school. Many households incurred substantial private costs for education. Numerous problems were identified as priority concerns with the proportion identifying problems being equal in the municipal and open country subsamples. Willingness to pay an additional amount for problem elimination was indicated by a smaller proportion of open country respondents as many of them had identified high cost as the priority problem. The proportion indicating satisfaction with the return from expenditures on education (two-thirds) was the lowest of the seven services, with no difference between municipal and open country subsamples.

In a manner analogous to education, differential accessibility to health care services, and differing non-medical costs of securing services were reported by municipal and open country households. The higher travel distances (and costs) of open country households were the primary cause of these differences. Health care services were utilized often and non-medical costs were high for many respondents. Priority problems differed slightly as did willingness to pay an additional amount (the open country proportion willing to pay extra was lower). Satisfaction with return on health care expenditures was also indicated by a lower proportion of open country respondents.

Limitations and Implications of the Research

There is little agreement on the extent to which responses gathered in a survey, such as the one reported here, can be considered reliable. Discussions within the Technical Research Committee and those the committee

members have been involved in on numerous other occasions have included debate of the ability of consumers to evaluate the appropriateness of or their satisfaction with services they receive. Such debates will undoubtedly continue throughout the foreseeable future.

The size of this survey, the distribution of respondents over four states and three types of counties within those states, and the county-to-county and state-to-state consistency of responses provide arguments supporting the reliability of the findings. While the sample is small relative to the population of the Great Plains, the consistency of responses from randomly selected respondents indicates the sample need not be large to secure reliability. Given these conditions, the Technical Research Committee believes the responses provide useful indications of the availability, use, and acceptability to consumers of the services examined.

The analysis of the survey responses from the sample counties indicates:

1. The level of discontent over existing services and services delivery systems varies from service to service. With the exception of water supply and education, discontent is not high--which implies the services provided and the costs incurred are reasonably consistent with citizen expectations.
2. When there are feasible means of privately doing so, open country households supply privately many services that are publicly provided in municipalities (i.e., utilities). In so doing, they may create externalities (many wells drawing from an aquifer, sewage in road ditches, numerous private dumps scattered across the countryside, etc.), but these externalities are not identified as problems. The lack of concentration of externalities and the

low population densities of the Great Plains in interaction with expectations that are not inconsistent with these aspects of services, result in acceptance of the services as appropriate.

3. Services that are delivered through interactions between individuals, and that are evaluated in terms of consistency with the value sets of individuals (i.e., law enforcement, education, and health care), have lower proportions of respondents who reported the return from expenditures to be adequate. Education was the most subject to criticism of all the services examined.
4. Health care is delivered through interactions between individuals. Both the health care services and (for many of the respondents) access to those services are costly. But, health care services are viewed much more favorably than might be expected in light of these costs and the labor intensive delivery systems--perhaps the "magic" component of health care is still sufficiently large to prevent evaluation in terms of the value sets of consumers.

Taken together, these aspects of responses to the survey indicate evaluations of services adequacy are a function of relative deprivation, i.e., the extent to which the services used by citizens conform to their expectations for those services. If so, only by demonstrating that national standards or criteria of services adequacy are superior to residents' values and expectations as a basis for decision making, can the widely accepted belief that services are inadequate in rural areas be justified for Great Plains counties.

Related Research

As is always the case this research effort does not stand alone. It seems appropriate to include a brief discussion of related research and a list of references. At the same time the literature on services research is too numerous to cite fully. As a sampling, we suggest the recent bibliographies published by Clemson University and Rural Development Service [11,15]. Experiment Station publications include several reports by Regional Research Committees [2,6,12,16]. Individuals, or groups of individuals, have published on a variety of aspects of community services, e.g., [1,8,9,17]. And, survey efforts in several states have provided citizen perspectives on services in a variety of circumstances [3,4,7,10, 14]. We will not attempt to discuss these except to mention that we found nothing in reports from other surveys that severely conflicts with the findings reported here.

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