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SAMPLED HOUSEHOLD VIEWS ON VARIOUS ASPECTS OF SELECTED RURAL
SERVICES IN HAAKON, GRANT, AND BROOKINGS COUNTIES,
SOUTH DAKOTA

BY

TERRY L. HICKENBOTHAM

A thesis submitted
in partial fulfillment of the requirements for the
degree Master of Science, Major in
Economics, South Dakota
State University

1977

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SAMPLED HOUSEHOLD VIEWS ON VARIOUS ASPECTS OF SELECTED RURAL
SERVICES IN HAAKON, GRANT, AND BROOKINGS COUNTIES,
SOUTH DAKOTA

This thesis is approved as a creditable and independent investigation by a candidate for the degree, Master of Science, and is a acceptable for meeting the thesis requirements for this degree. Acceptance of this thesis does not imply that the conclusions reached by the candidate are necessarily the conclusions of the major department.

Thesis Advisor ' /

Date

Major Advisor ' /

Date

 Head, Economics Department

Date

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TLH

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CHAPTER I

INTRODUCTION

Sufficient and relevant information on existing levels of rural area services is a necessity for public and private suppliers if effective and efficient decisions are to be made concerning the creation of, addition to, or adequacy of various rural services. The primary purpose of this thesis is to obtain information on the adequacy of selected rural services from the perspective of the consuming household.

When a given good or service is provided primarily through the private market, market analysis and pricing rules apply. However, circumstances may exist or may arise such that consideration by public officials of some aspect of a particular privately provided good or service may appear to be advantageous. For instance, external costs of private burning of solid wastes may be of such magnitude that collective action or public sector intervention is deemed necessary. In this case the privately provided service, solid waste management, is said to have public good characteristics¹ and consequently, society may deem it desirable to exercise government regulation, control, or ownership.

For reasons to be discussed later, the public sector may be involved in the provision of some good or service. When the principal source of provision of some good or service is the public sector, consumer preferences may not be accurately revealed. Price, the

¹Public goods are discussed in more detail in the section entitled "The Nature of Community Services."

rationing mechanism of the private market, may not be the basis for distributing publicly provided goods and services among competing wants. Public policy and decision makers consequently encounter difficulties determining which and how much of various goods and services to provide and to whom they should be provided.

Without a market mechanism the information necessary to decision makers concerning the "desired" level of provision is not available. The political process may provide such information indirectly. However, the political mechanism may be incapable of translating changing consumer preferences for such services into changes in service provision levels. Moreover, because of legal restrictions, expressed or implied mandates, or established minimum service provision levels set in line with standards of some extra-community agency,² a governing body may find it has a budget already constrained by its need to provide a minimal amount of goods and services to all consuming households. Faced with this situation the governing agency may have to sacrifice quality to maintain the existing quantity of such services. Consequently, consumers within the political jurisdiction may encounter quality and quantity related trade-offs associated with certain community services. The standards used to set minimum service levels may also be outdated or otherwise inapplicable to the particular community or jurisdiction.

²R. Beto Brunn and Lonnie L. Jones, "Supply and Demand of Community Services: A Conceptual Analysis," Public Services for Rural Communities: Some Analytical and Policy Considerations, Great Plains Agricultural Council Publication No. 70, Texas Agricultural Experiment Station, Texas A&M University, College Station, Texas, January, 1975, p. 25.

Finally, agency decisions relating to the adequacy of service provision may be based on agency oriented notions of efficiency (rather than on the needs of the public).³

The adequacy⁴ of community services can be considered from the viewpoint of government standards, a government agency, or the consuming household.⁵ The latter viewpoint was the one utilized to evaluate the adequacy of service provision in selected rural areas of South Dakota. In addition to considering community services⁶ in the areas sampled, the study also investigated the adequacy of selected goods

³Paul H. Gessaman, "Delivery Systems and Decision Making for Rural Community Services: Some Implications for Research," Public Services for Rural Communities: Some Analytical and Policy Considerations, *ibid.*, p. 9.

⁴When the term "adequacy" is used in this chapter, it is intended to include the possibility that the good or service is either sufficient or insufficient in terms of quantity and quality.

⁵"Household" refers to the people, collectively, who reside in a dwelling which has a common entrance for those residents.

⁶"Community services" refers to those goods and services provided by a government body, usually local, to the residents of that government's jurisdiction, most of whom live in close proximity to one another. Some of the literature on goods and services provided on a community basis use the expression "community services" to include those goods and services provided by private agencies. "Public provision" can imply both production and/or distribution of the goods or services by the public sector. In some cases, however, authority for production or distribution may remain in the hands of the government but responsibility for production and/or distribution may have been delegated to a private firm. In this instance, the good or service is still considered to be publicly provided and the expression "community services" is still used. Hence, those community-type goods and services provided by private firms without "public provision" implications are referred to as privately provided goods and services.

and services privately provided in those areas.⁷

In the remainder of this chapter the general nature of community services, some of the approaches available for investigating these services, the objectives of this research effort and the associated approach taken, the literature review, and an outline of the following chapters are discussed.

The Nature of Community Services

It is important to this study to discuss the nature of community services because the nature of any given service is likely to significantly affect not only the type of problems encountered by consumers but also consumer preferences and the willingness of consumers to reveal their true preferences. This section includes discussions of the reasons why the public sector provides certain services and the issues related to the financing of these services.

Reasons for Public Provision

Werner Z. Hirsch outlined four reasons for state and local government involvement in the provision of goods and services: (1) public good characteristics; (2) benefits flowing from public monopolization; (3) gains from regulation; and (4) merit good considerations.⁸

The public good aspects of some good or service may lead to

⁷While the majority of the discussion in this chapter is devoted to publicly provided goods and services, data were also collected on various privately provided goods and services for the use of private and public suppliers.

⁸Werner Z. Hirsch, The Economics of State and Local Governments (New York: McGraw-Hill Book Company, Inc., 1970), pp. 1-2.

government provision. The private market is a mechanism for distributing scarce resources between buyers and sellers based upon price which performs a rationing function. Goods which have both the characteristics of rivalry⁹ and excludability¹⁰ are those optimally allocated in the private market. In situations where exclusion of all benefits (costs) cannot be accomplished by charging a private market price, the market does not reveal the "true" preferences of consumers and hence too little (much) of some good is produced. Moreover, when all costs (benefits) are not accounted for by suppliers of a good, too much (little) of the good is produced. Under these circumstances, the private market has proven inefficient in the distribution of goods and services and the political process has often been relied upon for the determination of whether there should be public sector provision. If consumption is nonrival and nonexcludable, the act of payment is not closely connected with the act of consumption. Hence, the pricing mechanism cannot perform its rationing function because consumers need not pay for consumption. When both nonrivalry and nonexcludability are present, a good or service is referred to as a "public good."

Another reason given for state and local government provision

⁹"Rivalry" refers to the principle that benefits derived from the consumption of a good or service by one consumer detracts from the consumption of the good or service by other consumers.

¹⁰"Excludability" means that if consumer A's consumption of a good or service is made contingent on his paying the associated price of the good or service, then consumer B, who does not pay, is excluded from consumption. For a more detailed discussion of both of these terms, see: Richard A. Musgrave and Peggy B. Musgrave, Public Finance in Theory and Practice (New York: McGraw-Hill Book Company, Inc., 1973), pp. 52-54.

of goods and services is that the net benefits from public monopolization of some community services are anticipated¹¹ to be greater than those yielded through private provision. There are at least two ways in which it may be perceived that public monopolization and hence public provision is more beneficial than private provision.¹² The first involves a case in which a monopoly may evolve because the provision of some good or service requires the employment of "... a highly and scarce and singly-owned resource for which there are few [if any] close substitutes."¹³ A privately owned monopoly can charge a price above its marginal cost, and this may lead to returns which society deems excessive. To prevent this, a public monopoly may be established.

The second way in which public monopolization may appear to be more beneficial than private provision is one where significantly large economies of scale are present in production and distribution relative to the size of the market for a good or service. For instance, a municipal water system may have economies of scale that result in significant cost savings to consuming households when compared to the costs associated with drilling and maintaining individual wells for each home.

¹¹It may well be that a public monopoly may yield net costs to the community or jurisdiction or may have less net benefits than a corresponding private monopoly. The point is that "anticipation" that net benefits through public monopolization will be greater leads to public provision of some service.

¹²Hirsch, p. 2.

¹³Ibid.

Regulation that controls and perhaps reduces socially costly behavior is the third reason for public sector provision of goods and services at the state or local level.¹⁴ Examples of various forms of regulation include the requirements specified by planning boards, zoning departments, and auditing agencies. For instance, zoning is aimed at controlling such socially costly behavior as urban sprawl.

The final reason listed for public provision at the state and local level is "merit good" considerations. In the words of Hirsch, it may be perceived that

... interdependencies in utility functions ... [exist] ... such that citizens receive pleasure or other benefits from knowing that some of their fellows are able to consume more of certain services than they would be able to consume if the market-place alone determined distribution.¹⁵

A particular government therefore provides the good or service in question at a price that it determines so as to change " ... the allocation from that which would result from the workings of the market mechanism."¹⁶

Whatever the reason for government provision, it can be understood that consumer preferences are not readily revealed under some circumstances or for some types of goods or services. In addition,

¹⁴Ibid.

¹⁵Ibid. Some economists argue, however, that merit goods are nothing more than consumption externalities. For an example of this position, see: John F. Due and Ann F. Friedlaender, Government Finance: Economics of the Public Sector (Homewood, Illinois: Richard D. Irwin, Inc., 1973), p. 80.

¹⁶Hirsch, p. 2.

decisions concerning government provision are not based entirely upon consumer preferences but also upon such considerations as the welfare of lower income individuals and political leverage. For these reasons and others, the mechanism allowing for the production and distribution of goods and services is less efficient in the public as compared to the private sector.

Issues in Financing

The problem for the public sector does not end at this point. Governments must determine not only what to produce and in what quantities, but also who should pay, how much each should pay, and in what form payment should be made. Discussion of who should pay and how much each should pay has revolved around the benefit principle and the ability to pay principle.¹⁷ A closely connected problem is a determination as to which level of government should provide the goods or services. That is, the method of finance is dependent upon a particular government's ability to collect payment from those using the good or service within its jurisdiction. This issue concerns not only jurisdictional conflicts but additionally the consideration that certain financing arrangements are best suited for certain governments.

Consequently, the payments extracted from a consumer of a

¹⁷Briefly stated, the concept of the benefit principle is that those who receive the benefits of a particular good or service should pay for them according to the benefits they derive from the consumption of the good or service in question. Strict adherents to the ability to pay principle call for equal payments to be made by taxpayers with equal abilities to pay and for different amounts of payment for those whose payment capacities differ.

professional groups.¹⁹ These standards are usually determined with the particular publicly provided good or service may not be directly related to the act of consumption. This will be especially true if the method of finance for the good or service in question is based upon the ability to pay principle. In those instances where a good or service is financed by general revenue taxation, any given taxpaying consumer generally does not know the costs he is incurring to "consume" a particular good or service. Thus, the various issues and considerations involved with payment for publicly provided goods or services makes preference revelation even more difficult to ascertain. The following discussion illustrates some of the approaches which are available for considering consumer satisfaction and welfare with regard to various service delivery systems. These approaches apply primarily to community services rather than to privately provided goods and services.

Approaches Available for Researching the Adequacy of Community Services

There are numerous approaches that might be taken in order to evaluate the adequacy of selected rural services from the perspective of the consuming household. Outlined below is a listing of some of these approaches accompanied by a brief overview of their respective advantages and difficulties.

One approach that can be used is one which compares existing levels of service delivery with standards set by governments or

¹⁸Only what this author considers to be "workable" approaches are discussed. Consequently, approaches that involve measurements of utility -- individual utility approach, social welfare function -- are excluded from discussion.

professional groups.¹⁹ These standards are usually determined with the aim of establishing minimum requirements for service levels. The minimum service levels are thought to be those which are necessary to maintain the health and welfare of consumers. While the standards may have been established with consumers in mind, they are determined by professionals and/or experts in the field and do not necessarily take into account the views of consuming households. In addition, the standards may become outdated or be inapplicable to a particular geographic area. Finally, standards may not be useful because they cannot be used to evaluate all aspects of a given service delivery system.

A second approach is benefit-cost analysis.²⁰ Benefit-cost analysis may or may not attempt to quantify both tangible and intangible benefits and costs. If the benefits and costs of intangibles are estimated, one must have some notion of what is "good" and "bad" for those involved in consumption as well as "how good" or "how bad" the intangibles are considered to be. (In the terminology of economics, this estimation is referred to as "utility measurement.") There are many difficulties with this approach but most are related to the fact that this kind of analysis determines not what demand of consuming

¹⁹ U.S. Department of Agriculture, Rural Development Service Health Services in Rural America, by Tresa H. Matthews, Agriculture Information Bulletin No. 362 (Washington, D.C.: Government Printing Office, 1973), p. 5-14; and U.S., Congress, House, Committee on Agriculture, Federal Health Policies in Rural Areas, Appendix to hearings before a subcommittee of the House Committee on Agriculture. 93d Congress, 2d session, 1974, pp. 30-31. (Micrographed.)

²⁰ Hirsch, pp. 25-26.

households "is" but what demand "should be." As a result, problems are encountered such as determining the appropriate service delivery system(s) to study or determining the appropriate discount rate.

Another approach includes different methods which might be labeled generally as "public choice" approaches.²¹ These approaches supposedly have the advantage of reflecting true preference revelation of consumers because they are directly related to the study of actual consumer behavior. Such relevant consumer actions as voting behavior and consumer mobility are studied in order to determine such things as service demand elasticity or preferred mixes of services. Difficulties encountered with the "public choice" approaches include quantity measurement, bias towards the median voter, effects of the costs of voting and/or moving, "logrolling," and multi-peaked preferences.²² In defense of the "public choice" methods, one can argue that the findings on "revealed preferences" can be analyzed with the tools of price theory.²³

The final approach to be considered is the survey method. This procedure may be used to determine or evaluate such topics of interest as households' needs, problems, use rates, and costs. Because the individual household is interviewed, this approach has the advantage of

²¹For a further discussion and a partial listing of particular studies, see: Hirsch, pp. 13-24; and Robert T. Deacon, "Review of the Literature on the Demand for Public Services," paper presented at the National Conference on Nonmetropolitan Community Services Research, Ohio State University, January 11-13, 1977. (Mimeographed.)

²²Ibid., pp. 3-13.

²³Ibid., p. 2.

providing direct information on consumer preferences. In addition, it has an advantage over such techniques as analyzing voting behavior because it is assumed that it reduces voting costs — costs of becoming familiar with ballot issues and time and money expended in the act of voting. However, if willingness to pay questions are used in the survey, one is faced with the difficulties of strategic behavior -- "overstatement bias," "free rider effect," and the "insignificant effect."²⁴ Interviewer biases, problems of survey design, statistical biases, and nonresponses are also encountered.

The survey approach can be designed from two different perspectives. Relevant researchers and decision makers can decide which service is a priority and then ask specific questions about the service upon which additional decisions can be based. This philosophy, however, allows for agency oriented decisions concerning which service should be given priority for study and thereby reduces the input of consuming households.

²⁴These difficulties in reference to a consumer services survey are defined as:

- a. Overstatement bias occurs if individual groups know that their overstatements of willingness to pay will not affect their tax valuations or user costs.
- b. The free rider effect may occur if the respondent knows that his response of willingness to pay will be related to his tax burden and hence the respondent will have a tendency to understate his true valuation.
- c. An insignificant effect occurs if an individual withholds revelation of his willingness to pay because he realizes that the total demand for some service will be virtually unaffected by his own preference revelation.

See: Peter O. Steiner, Public Expenditure Budgeting (Washington, D.C.: The Brookings Institution, 1969), pp. 24-27; and Joseph J. Seneca and Michael K. Taussig, Environmental Economics (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1974), p. 95.

A variation is to design a questionnaire such that several services can be compared in order to gain more consumer input. With this method the various aspects of a given service can be evaluated. It may also be possible to compare services to determine which are revealed to be higher priorities for consideration.

The approach taken in any research effort will be based on two considerations. The researcher will be concerned with the advantages and difficulties of a given approach and also with which approach, despite its limitations, will most adequately fulfill the objectives of the research. The objectives of this study are listed below.

Objectives

The general objective of this study was to assess the adequacy of selected services in rural communities of South Dakota from the perspective of the consuming household. Specific objectives were:

1. to determine the service delivery systems employed in various areas;
2. to identify the substitute delivery systems available;
3. to estimate private household costs incurred in the use of selected services;
4. to determine the accessibility of various service delivery systems to "consuming" households;
5. to consider households' utilization of various services;
6. to identify specific service problems encountered by rural area residents; and
7. to estimate the willingness to pay (of the aggregation of households) for the elimination of specified problems.

The approach well suited to meet these objectives was determined to be the survey approach aimed at evaluating the relevant

aspects of several selected services. The study was not intended to be an analysis of demand but rather a pilot study for establishing the services and areas where problems and needs exist. As a pilot study, this work can provide others with information regarding which services require further study.

Literature Review

Few research efforts have been conducted in South Dakota concerning the adequacy of selected services. One that most closely approximated the objectives and approach of this thesis was entitled Human Needs Assessment of the Fourth, Fifth and Sixth Planning Districts, South Dakota.²⁵ This needs survey was conducted using a personal interview technique. Among its objectives were the determination of service prioritization and the identification of problems and needs of responding households in urban and rural areas of the sample districts. In terms of prioritized areas (ranked in terms of "percent concerned"), education (2nd), health (5th) and law enforcement (7th) were relevant to this study. Of particular relevance was the fact that 20 percent were dissatisfied with city police services while 12 and 6 percent were dissatisfied with county sheriff and Highway Patrol services, respectively. Water distribution service was available to 66 percent of the respondents with approximately 92 percent indicating

²⁵Institute of Social Sciences for Rural-Urban Research and Planning, Human Needs Assessment of the Fourth, Fifth and Sixth Planning Districts, South Dakota, Final report prepared for the South Dakota Department of Social Sciences, (Brookings, South Dakota: South Dakota State University, 1974).

satisfaction with water distribution services. Nearly identical figures were found for sewer collection availability and satisfaction. Solid waste collection was available to nearly 65 percent of the responding households with 90 percent satisfied with the service they received. While this is a brief review of the results, it is important to note that for those services with problems and consumer dissatisfaction, specific problems were not delineated in most cases nor was there any way of measuring consumer discontent such as willingness to pay to correct a problem.

A descriptive study which dealt with the Physician Shortage in South Dakota (1968) was based primarily on secondary data.²⁶ Of importance to this thesis was the fact that South Dakota had one of the lowest physician to population ratios in the nation supposedly suggesting that a physician shortage existed in South Dakota. In line with the "standards" approach described in an earlier section, the study referred to various standards that have been set which supposedly were measures of adequacy of health services. These standards were based on physician/population ratios. However, the ratios discussed were determined in 1933 and 1953 by various groups and are of questionable present relevance due to changes in qualitative aspects of physician services.

Finally, Powers and Bierman conducted a descriptive and tabular

²⁶South Dakota, State Legislative Research Council, The Physician Shortage in South Dakota, Staff memorandum prepared for the South Dakota House of Representatives in conjunction with House Resolution No. 3 (1-16-68), Pierre, South Dakota, September 6, 1963.

analysis of hypothetical demand and supply availability of medical services in northwest South Dakota.²⁷ Based upon the geographic characteristics of the area and the changing characteristics of the population, especially age, it was hypothesized that demand for health services would increase because of the increased health needs of an aging population. Whether individuals in the area were having actual difficulties in obtaining health care was not analyzed. The study was somewhat agency oriented in that it was concerned more with service availability and efficiency than with actual consumer problems and preferences.

Outline of Thesis

The objectives of this study were intended to add to the knowledge of decision makers concerning consumer preferences for selected services. This chapter has briefly identified some of the difficulties involved with preference revelation for community services, ways of studying consumer preferences for such services, and the specific objectives of this study.

The specific steps taken in order to secure the data sought are described in Chapter II. Chapters III, IV, and V include descriptions of characteristics of household consumption of the services studied and discussions of the results. The results include the kinds of delivery systems available, costs, accessibility, utilization,

²⁷ Mark J. Powers and Leland G. Bierman, Supply and Demand of Medical Services in Northwest South Dakota: An Economic Analysis, Agricultural Experiment Station, Economics Department, Bulletin No. 563, South Dakota State University, Brookings, South Dakota, 1970.

problems, and the willingness to pay to correct the problems associated with particular services. Hypothetical explanations are given for some of the problems encountered by consuming households. In Chapter VI, the most significant findings are reviewed and the implications of these findings are discussed.

Sample Design

Sample design encompasses the aspects of the scope of the research, the sampling plan, sample size, and the sample selected. The procedural details of these topics are discussed in reference to this research effort.

Scope of the Research

Seven services were selected for study because of their importance to rural areas: household water, sewage disposal, solid waste management, fire protection, law enforcement, education, and health care services. The population from which these services were studied was the set of all consuming households in South Dakota. However, households within Standard Metropolitan Statistical Areas were excluded since the study was aimed at rural areas.

Sampling Plan

A survey was conducted using a multistage sampling plan. The

CHAPTER II

METHOD OF APPROACH

The method of approach employed to fulfill the objectives listed in Chapter I involved use of a personal interview survey. The survey design includes sample design and questionnaire design, the specifics of which are considered in this chapter. In addition, a brief description of the general characteristics of the sampled areas is provided.

Sample Design

Sample design encompasses the concepts of the scope of the research, the sampling plan, sample size, and the sample selected. The procedural details of these topics are discussed in reference to this research effort.

Scope of the Research

Seven services were selected for study because of their importance to rural areas: household water, sewage disposal, solid waste management, fire protection, law enforcement, education, and health care services. The population from which these services were studied was the set of all consuming households in South Dakota. However, households within Standard Metropolitan Statistical Areas were excluded since the study was aimed at rural areas.

Sampling Plan

A survey was conducted using a multistage sampling plan. The

first stage of the sampling plan involved stratification¹ of the population by counties within South Dakota. From the counties which fit into the various strata, three counties were selected based upon how well they fit specified criteria in the judgment of the researchers.

The criteria² used to define the different strata were:

1. County (Stratum) One -- The counties in this stratum were to:
 - a. have a low population density ($0 < X \leq 5$),³
 - b. have range livestock or extensive grain farming as the major economic base, and
 - c. have been located outside the commuting range of any major urban center.
2. County (Stratum) Two -- The counties in this stratum were to:
 - a. have a relatively moderate population density ($5 < X \leq 15$),
 - b. have a diversified agricultural economic base, and
 - c. contain a municipality with agricultural trade and service facilities.⁴
3. County (Stratum) Three -- The counties in this stratum were to:
 - a. have a high population density ($X > 15$),
 - b. have a diversified industrial-agricultural base, and
 - c. contain a city with industrial activity.

The sample size was 250. The sample was proportionately allocated among the three counties based upon the proportion of the

¹Stratified sampling is the division of the population into subpopulations, or strata, with a sample taken from each of the strata. The items within the strata are similar but the various strata are dissimilar. See: Robert W. Winkler and William L. Hays, Statistics: Probability, Inference, and Decision, 2nd ed. (New York: Holt, Rinehart and Winston, Inc., 1975), pp. 735-739.

²Bill Nelson, "Research Design: NC-102, Multistate Project," North Dakota State University, Fargo, North Dakota, July 30, 1974. (Mimeographed.)

³X represents persons per square mile.

⁴Municipalities that were judged to fit this category had populations ranging from two thousand to seven thousand people.

population that each county had of the combined total of the three counties according to 1970 census figures. Stratification was used because it enabled the author to provide estimates for the subpopulations, because it was efficient from an administrative standpoint, and because the use of stratification was expected to yield increased precision of the estimates as compared to simple random sampling.

Despite the fact that an urban center was used as one of the characteristics of stratum three, the city in question was not included in the sample because it was not considered within the scope of the study. The population of the urban center was not considered as part of the population of county three. Consequently, the proportional allocation of the sample of 250 between the counties was based only upon the non-trade center population of the counties.

Counties which fit into these strata were screened by an additional criterion which was the exclusion of those counties with native American reservations within their boundaries. Counties with reservations were excluded from the surveyable counties for two reasons: (1) Many of the services considered in the research (such as various health services of the Indian Health Service) are provided to reservation residents without charge and hence questions relating to willingness to pay would be of dubious value, and (2) substantially different governmental structures are utilized for service provision on reservations.

Stratification of each county was employed at the second stage of the sampling plan. Each county was stratified by organized

municipalities and "open country" areas.⁵ The sample for each county was proportionately allocated among municipalities and open country areas based upon the same technique used in the first stage. Moreover, the allocation of the sample designated to municipalities was allocated proportionately among the municipalities within each county.

The third stage of the sampling plan involved cluster sampling⁶ of both the municipal and open country areas of each county. Municipalities were divided into clusters based upon city blocks. Those areas of a city or town which were not in city block form were arbitrarily sectioned into blocks. All "blocks" of each municipality were then numbered. These blocks were randomly selected via use of random number tables. In the actual administration of the survey, interviewers were instructed to survey the residence located on or nearest to the northeast corner and the middlemost⁷ home on the western side of the selected "blocks."⁸

The open country areas of each county were divided into clusters⁹

⁵"Open country" areas refer to those areas within a county which lie outside the official boundaries of organized municipalities.

⁶Cluster sampling is a sampling technique in which the population is divided into subpopulations so that there is little or no variability between clusters. See: Winkler and Hays, pp. 739-741.

⁷It was left to the interviewer's discretion to determine the "middlemost" home.

⁸If a multiple-residence dwelling was selected, an interviewer was instructed to select the nearest household to his right upon entering the main entryway of the structure.

⁹County one was divided into sections measuring four by four miles where possible and 16 square miles otherwise. County two was divided into one by four mile sections and county three into one by one mile sections.

and clusters for each county were numbered. These areas were randomly selected via use of random number tables.¹⁰ All households within these randomly selected clusters were approached for interviews.

In the case of both municipalities and open country areas, the clusters (blocks in the case of municipalities) were interviewed in the order of their respective random selections until the desired number of proportionately allocated interviews was obtained. Clustering was used to reduce transportation and salary costs and to minimize the amount of time expended in conducting the survey.

The limited amount of funds to conduct the survey loomed as the most important constraint on the type of sampling plan that could be utilized. With the cost constraint in mind, the problem was one of deciding which sampling plan would be most economical and at the same time meet the objectives set forth in Chapter 1. Consequently, two stages of stratification and a third stage of cluster sampling were used to conform to the budget and to adequately reflect a cross section of opinions of rural area residents in South Dakota.

Sample Selected

The three counties (1, 2, and 3, respectively) selected for the survey were Haakon, Grant, and Brookings which had respective 1970

¹⁰The two random number tables used were: H. N. Broom, "New Random Sampling Numbers," Baylor Business Studies, No. 1 (Waco, Texas: The Baylor University School of Business, 1965); and Rand Corporation, A Million Random Digits (Glencoe, Illinois; The Free Press, 1955).

population densities of 1.5, 13.2, and 17.7 people per square mile.¹¹

The total number of interviews as they were allocated between the three counties is shown in Table II-1. On the basis of the proportion of the total population located within each county (14, 44, and 42 percent, respectively) 35, 110, and 105 interviews were assigned to Haakon, Grant, and Brookings Counties, respectively.

TABLE II-1. ALLOCATION OF INTERVIEWS AMONG COUNTIES

County	County Name	Population 1970	Percent of Total County Population	Number of Interviews Assigned
1	Haakon	2,802	14	35
2	Grant	9,005	44	110
3	Brookings	8,441 ^a	42	105
TOTALS		20,248	100	250

^aThe City of Brookings, the major trade center in Brookings County, was subtracted from the county population total. The actual county population of 22,158 less the population of Brookings (13,717) yielded the surveyable county population of 8,441.

SOURCE: U.S., Department of Commerce, Bureau of the Census, Census of Population: 1970, Vol. 1, Characteristics of the Population; Part 43, South Dakota (Washington, D.C.: Government Printing Office, 1973), p. 14.

The distribution of the sample between municipalities and open country areas of each county is shown in Table II-2. For example, since the municipal population of Haakon County accounted for 45 percent

¹¹U.S., Department of Commerce, Bureau of the Census, Census of Population: 1970, Vol. 1, Characteristics of the Population; Part 43, South Dakota (Washington, D.C.: Government Printing Office, 1973), p. 14.

TABLE II-2. ALLOCATION OF INTERVIEWS AMONG MUNICIPAL AND OPEN COUNTRY LOCATIONS

County	1970 Population		Percent		Interviews Assigned	
	Municipal	Open Country	Municipal	Open Country	Municipal	Open Country
Haakon	1,253	1,549	45	55	16	19
Grant	5,017	3,988	56	44	62	48
Brookings	2,607	5,834	31	69	34	71

of that county's total population, 16 interviews (approximately 45 percent of the 35 interviews allocated to the county) were apportioned to the municipalities of Haakon County.

According to the same reasoning, Table II-3 illustrates the allocation of each county's municipal interviews between the municipalities within each county.

Since the interviewer asked for the number of persons residing in each household, it was possible to determine the number of individuals accounted for by the survey based upon those interviews which were completed. In addition, by using 1970 United States Census data, the percent of the total number of households accounted for was computed. These data are shown in Table II-4. As shown, approximately 4 percent of the total number of individuals as well as approximately 4 percent of the total number of households in each county were accounted for by the survey.

Questionnaire Design

The interview procedure and the analysis of the data are components of the questionnaire design. The specific ways in which these

TABLE II-3. ALLOCATION OF MUNICIPAL INTERVIEWS AMONG MUNICIPALITIES

County	1970 Population of Municipalities	Percent of Municipal Population	Number of Interviews Assigned
Haakon	<u>1,253</u>	<u>100</u>	<u>16</u>
Midland	270	22	4
Philip	983	78	12
Grant	<u>5,017</u>	<u>100</u>	<u>62</u>
Albee	26	1	1
Big Stone City	631	13	8
Labolt	90	2	1
Marvin	65	1	1
Milbank	3,727	74	46
Reville	142	3	2
Stockholm	116	2	1
Strandburg	98	2	1
Twin Brooks	122	2	1
Brookings	<u>2,607</u>	<u>100</u>	<u>34</u>
Aurora	237	9	3
Bruce	217	8	3
Bushnell	65	2	1
Elkton	541	21	7
Sinai	147	6	2
Volga	982	38	13
White	418	16	5

TABLE II-4. NUMBER AND PERCENT OF INDIVIDUALS AND HOUSEHOLDS ACCOUNTED FOR BY SURVEY

County	Population 1970	Number Covered	Percent Covered	Households 1970	Number Covered	Percent Covered
Haakon	2,802	115	4.10	861	35	4.00
Grant	9,005	357	3.96	2,752	110	3.99
Brookings ^a	8,441	338	4.00	2,603	105	4.03

^aExcluding the City of Brookings.

SOURCE: U.S., Department of Commerce, Bureau of the Census, Census of Population: 1970, Vol. 1, Characteristics of the Population; Part 43, South Dakota (Washington, D.C.: Government Printing Office, 1973), p. 43.

procedures were conducted are outlined below.

Interview Procedure

The survey of households involved use of the personal interview technique. Three interviewers (including this author) were instructed in interview procedures in order to minimize interviewer bias. Despite the possibility of interviewer bias, it was thought that personal interviews would yield a more reliable and detailed set of data and a higher response rate.¹²

To reduce bias resulting from nonresponses, interviewing was conducted at times ranging from 3:00 A.M. to 10:00 P.M. on all days except Sundays. In addition, if interviews were not secured on the first attempt because of a "not at home,"¹³ interviewers were instructed to make at least two additional callbacks at sufficiently later time periods.¹⁴ All individual responses were and remain confidential. Interviewing began May 12, 1976 and concluded August 13, 1976.

Analysis of Data

The data related to the characteristics of household consumption of the selected services is handled in a descriptive manner. These characteristics include such items as principal sources, costs, and

¹²For response rates, see Appendix A.

¹³A "not at home" occurred when either no one was home or no adult was at home who could provide answers to the questions.

¹⁴If an interview was not obtained after three attempts, the household was considered a nonresponse. However, there were instances in which an interview was obtained on a fourth attempt.

utilization of various services.

Particular emphasis is placed upon the sample results pertaining to the "adequacy" of each of the selected services. The evaluation of "adequacy" is based upon the aggregation of household responses to the following questions which apply to each service:

1. "Have you had any of these specific problems within the past three years?"
2. "Which problem would you most like to see eliminated?"
3. "Would you be willing to pay an additional amount above your present cost to eliminate that problem?"
4. If yes, "How much would you be willing to pay monthly or yearly to eliminate that problem?"
5. "Are you getting your money's worth from what you spend on ... [some specific service]?"

Some households have had service problems during the past three years. This finding yields no information as to the severity of the problems for a given household or for the aggregation of households. To obtain information as to the "importance" of the identified problems, the respondent in each sampled household was asked to specify which problem it would most like to see eliminated and whether household members would be willing to pay an additional amount to eliminate that problem.¹⁵ Those households which expressed a willingness to pay

¹⁵One may argue that the existence of greater willingness to pay implies that the household members would already be paying that amount in attempting to eliminate the problem. By this argument, willingness to pay is reflected not by what households say they are willing to pay but rather by the amount they are "currently" paying. There are two difficulties with this reasoning. The first difficulty is associated with the characteristics of publicly provided goods and services. Consider water services provided by a municipal water system. A household may be willing to pay an additional amount to improve the quality

were asked if the additional monthly amount they were willing to pay was less than \$5.00, \$5.00 to \$10.00, or greater than \$10.00 per month. The aggregation of the household responses to these questions allowed a determination of the problem areas associated with particular services and an evaluation of which services were considered to be "least adequate."

General Characteristics of the Sampled Counties

Various geographic, demographic, and economic characteristics of the three selected counties are designed to give the reader a better understanding of the sampled areas. Much of the information is summarized in Table II-5, the text presents data not easily tabulated.

In Haakon County, rainfall is relatively erratic and existing perennial streams have wide seasonal fluctuations in flow. Of particular interest is the fact that "ground water is scarce and of poor quality."¹⁶ Land use in the county is based mostly on farming and ranching with about three-fourths of the area used for grazing cattle or sheep. Winter

of the water while being satisfied with the quantity received. The payment mechanism may not allow the household to "reveal" this willingness in its monthly service payment. The second difficulty is related to the limited divisibility of a good or service for any consumer. That is, the quantity of a good or service may not be perfectly divisible and is thus available in discrete units. At the current price, a household may be purchasing X units of the service but be willing to pay for $X + \frac{1}{2}$ units of the service. However, the next quantity into which the good or service is available is $X + 1$. Thus, the household purchases only quantity X because the household demands a quantity less than $X + 1$ at the current price.

¹⁶ U.S., Department of Agriculture, Soil Conservation Service, Land Resource Regions and Major Resource Areas of the United States, by Morris E. Austin, Agriculture Handbook No. 296, (Washington, D.C., Government Printing Office, 1972), p. 28.

TABLE II-5. SELECTED CHARACTERISTICS OF HAAKON, GRANT, AND BROOKINGS COUNTIES

Characteristic	County		
	Haakon	Grant	Brookings
Climatic			
Average Annual Precipitation	15-20 inches	20-30 inches	20-30 inches
Average Annual Freeze-Free Period	140-160 days	140-160 days	140-160 days
Age Distribution, 1970			
Under 5 Years	9.4 percent	8.0 percent	6.9 percent
18 Years & Over	59.3 percent	62.4 percent	71.0 percent
65 Years & Over	11.2 percent	15.2 percent	10.4 percent
Median Age	26.6 years	31.3 years	22.4 years
Family Income, 1970			
Less Than Poverty Level	17.3 percent	16.7 percent	13.5 percent
\$15,000 or More	11.1 percent	8.7 percent	14.4 percent
Median Family Income	\$7,698	\$6,715	\$7,546
Education Level, 1970			
Median Years Completed, Individuals 25 Years of Age and Over	12.3 years	9.9 years	12.4 years

SOURCES: Climatic data from U.S., Department of Agriculture, Soil Conservation Service, Land Resource Regions and Major Resource Areas of the United States, by Morris E. Austin, Agriculture Handbook No. 296, (Washington, D.C.: Government Printing Office, 1972), pp. 27-28; and age, family income, and education data from U.S., Department of Commerce, Bureau of the Census, Census of Population: 1970, Vol. 1, Characteristics of the Population; Part 43, South Dakota (Washington, D.C.: Government Printing Office, 1973), pp. 98, 143, and 142.

wheat is the main crop. Elevation is from 2500 to 5000 feet in the extreme southwest section of the county and from 1800 to 3000 feet over

the rest of the area.¹⁷ The two incorporated municipalities in Haakon County, Philip and Midland, experienced respective population declines of 11.8 percent and 32.7 percent between 1960 and 1970.¹⁸ As a county, the population decline was 15.2 percent. No municipalities were urban (2500 people or more).¹⁹

Grant County, in the northeast corner of the state, and Brookings County, in the east central part of the state, have similar land use and geographic characteristics. Nearly all of the area of both counties is used for farms with anywhere from two-thirds to three-fourths of the area of each used for cropland. Corn, wheat, other small grains, and soybeans grown for feed and for sale are the major crops. Shallow wells have been the principal source of water for domestic and livestock needs while some water has been stored in stock dams for livestock use.²⁰

Milbank was the only municipality identified as urban in Grant County. Milbank's population increased by 6.5 percent from 1960 to 1970. Twin Brooks, near Milbank, had a 42 percent increase in population over the same period while all other towns had population declines ranging from 6.7 percent at Strandburg to 38.1 percent at Albee. Grant County declined in population by 9.2 percent from 1960 to 1970 and the rural area of the county (all of the county except Milbank) declined by

¹⁷Ibid., pp. 27-28.

¹⁸Census of Population: 1970, p. 12.

¹⁹Ibid., p. 14.

²⁰Austin, p. 26.

17.7 percent.²¹

Brookings County experienced a 1960 to 1970 increase in population of 10.5 percent although the rural areas of the county (all of the county except the City of Brookings) had an 11.0 percent population decline. The City of Brookings increased in population by 29.9 percent.²² One of the other seven municipalities, Volga, experienced significant growth, 25.9 percent, while two (Aurora and White) had practically no population growth. The remaining four had significant population declines.²³

Summary

The method utilized to meet the objectives of the study was discussed in this chapter. The study employed a survey based on a multistage sampling plan. Two hundred fifty households in Haakon, Grant, and Brookings Counties were personally interviewed in the summer of 1976. Particular emphasis in the following chapters is placed on the data pertaining to the adequacy of the seven selected services.

²¹Census of Population: 1970, pp. 11-14.

²²Ibid., p. 14.

²³Ibid., p. 11-12.

CHAPTER III

WATER, SEWAGE DISPOSAL, AND SOLID WASTE MANAGEMENT SERVICES

Water, sewage disposal, and solid waste management services are considered in this chapter. It is possible to exclude consumers from the consumption of each service. Excludability allows both public and private providers to make consumption contingent upon payment for the quantity consumed. If the service is publicly provided, the price paid is in the form of user charges¹ or fixed monthly fees. If the service is provided privately, the private market pricing mechanism applies. The costs for any household depend upon the physical environment in which the service is provided and the delivery system chosen by the household. Each service is considered separately in the remainder of the chapter and various types of data are tabulated and discussed in relation to each service.

Household Water Services

The data reported and discussed on household water services deal with the sampled households' responses regarding the principal sources (systems) of the household water, the systems available as substitutes to the principal water source, the average monthly household costs, and the adequacy of household water services.

¹Hirsch defined a user charge as "the dollars per unit of a good or service produced by government that are collected from the recipient." See: Werner Z. Hirsch, The Economics of State and Local Governments (New York: McGraw-Hill Book Co., 1970), p. 29.

Systems Used as Principal Sources

The type of household water system used by a sampled household was significantly related to a household's location -- either municipal or open country (see Table III-1). Approximately 90 percent of the

TABLE III-1. PRINCIPAL SOURCES OF HOUSEHOLD WATER BY LOCATION AND COUNTY -- NUMBER OF HOUSEHOLDS RESPONDING

Location & County	Municipal System	Private Well	Private System	Other	Total
Municipal:					
Haakon	14	1	0	0	15
Grant	58	4	0	0	62
Brookings	<u>28</u>	<u>6</u>	<u>0</u>	<u>0</u>	<u>34</u>
SUBTOTAL	100	11	0	0	111
Open Country:					
Haakon	4	7	8	0	19
Grant	0	47	1	0	48
Brookings	<u>1</u>	<u>64</u>	<u>4</u>	<u>2</u>	<u>71</u>
SUBTOTAL	<u>5</u>	<u>118</u>	<u>13</u>	<u>2</u>	<u>138</u>
3 COUNTY TOTAL	105	129	13	2	249

responding municipal households (100 of 111)² utilized municipal water systems. Conversely, nearly 86 percent of the sampled open country households (118 of 138) had private wells. Eight of the 19 sampled open country households in Haakon County utilized various forms of

²In this case, one municipal household did not respond to the question or an interviewer inadvertently did not ask the given question. In such instances, percentages are reported which are based on "responding" households. If all households responded to a question, then percentages are based on this fact and are referred to in the context of "... percent of the 'sampled' ... households indicated" This procedure is used throughout the remainder of the thesis.

private systems because of the low quality of aquifer water. Also, four Haakon County sampled open country households were on a municipal system because of their nearness to a municipality. None of the sampled households participated in rural water systems.

Substitute Sources of Household Water

More than 80 percent of the responding households (203 of 247) indicated that no other source was available other than the principal water source. It could be that some and perhaps many respondents interpreted the question, "What other sources of water are available to you?", to include only those household water sources that were available for use at the time the interviews were conducted. In addition to this, respondents may have considered only those substitutes that were feasible when compared to the prices they were paying for the systems being used as principal sources. In actuality, available substitutes included those systems that could have been utilized regardless of the relative prices of the various systems.³

The identified substitutes are shown in Table III-2. Slightly more than 88 percent of the responding municipal households (96 of 109) indicated that no substitute systems were available. Municipal households presumably considered the municipal water system to be the only household water source. Likewise, most open country households indicated that no substitutes were available (107 of 138, 77.5 percent).⁴

³Similar observations are applicable to the consideration of substitute systems for solid waste management services.

⁴Generally, percentages were rounded to the nearest tenth of a percent unless shown otherwise.

TABLE III-2. SUBSTITUTE SYSTEMS FOR HOUSEHOLD WATER BY LOCATION AND COUNTY -- NUMBER OF HOUSEHOLDS RESPONDING

<u>Location & County</u>	<u>Municipal System</u>	<u>Rural District</u>	<u>Private System</u>	<u>Private Well</u>	<u>Other</u>	<u>None</u>	<u>Total</u>
Municipal:							
Haakon	0	0	0	2	0	14	16
Grant	1	0	1	2	0	56	60
Brookings	<u>2</u>	<u>0</u>	<u>2</u>	<u>3</u>	<u>0</u>	<u>26</u>	<u>33</u>
SUBTOTAL	3	0	3	7	0	96	109
Open Country:							
Haakon	0	0	1	5	3	10	19
Grant	0	0	3	1	2	42	48
Brookings	<u>0</u>	<u>6</u>	<u>5</u>	<u>4</u>	<u>1</u>	<u>55</u>	<u>71</u>
SUBTOTAL	<u>0</u>	<u>6</u>	<u>9</u>	<u>10</u>	<u>6</u>	<u>107</u>	<u>138</u>
3 COUNTY TOTAL	3	6	12	17	6	203	247

Of the 44 sampled households which had identified an available substitute(s), 17 indicated it was a private well and 12 indicated the substitute was a private water system.

Among those sampled households which had available substitutes, approximately 43 percent (22 of 51) indicated that these substitutes were not used because their "present" source was adequate. Other reasons for not using substitute sources included too time consuming, too expensive, and poor quality -- listed by 1, 2, and 12 sampled households, respectively.

Average Monthly Household Costs

Respondents were asked to estimate their average monthly costs (including depreciation costs) for household water consumption. An

average of these estimated average costs was computed for each location in each county and these averages are tabulated in Table III-3. The

TABLE III-3. AVERAGE MONTHLY COSTS FOR HOUSEHOLD WATER -- BY COUNTY AND LOCATION

County	Location			
	Municipal		Open Country	
	Average Cost	No Cost Estimate (Percent)	Average Cost	No Cost Estimate (Percent)
Haakon	\$6.43	6.7	\$8.00	47.4
Grant	4.74	8.1	6.67	68.8
Brookings	2.69	20.6	6.25	69.0

household cost estimates are "fairly rough," particularly those shown for open country households, and should therefore be regarded with some caution.⁵

Average monthly costs (for household water) were highest among sampled households in Haakon County for both municipal and open country locations. Average monthly costs were lowest in Brookings County for the sampled households in both locations.⁶ Estimated average costs for the sampled open country households were generally higher than

⁵The municipal average cost estimates are more reliable than the open country average cost estimates for two related reasons. First, many municipal respondents had had receipts of past monthly bills with which to make fairly reliable estimates whereas most open country respondents did not have such receipts available. Second, a substantial majority of the sampled open country households supplied no cost estimates due to the difficulties involved in estimating the various component costs such as electrical (for water pumps), maintenance, and depreciation costs.

⁶The differences in average monthly costs between counties may indicate that prices (per unit of water consumed) varied because of the different costs of provision between the three counties, that quantities consumed varied among the counties, or some combination of differences in provision costs and quantities consumed.

those for the sampled municipal households. This latter statement may suggest that water costs for municipal households were lower than those for open country households because of the economies of scale achieved by instituting municipal water systems. However, it is difficult to arrive at firm conclusions about these data without further analysis and more reliable data.

The Adequacy of Household Water Services

The data obtained from the series of questions on the adequacy of water services are incorporated in Tables III-4, III-5, III-6, and III-7. Table III-4 contains the three county (total) sample results while the remaining three tables contain the subsample results from Haakon, Grant, and Brookings Counties, respectively.⁷

Over 70 percent of the responding households (175 of 248) had encountered household water service problems in the three years prior to the survey.⁸ Approximately three-fourths of the sampled municipal households (86 of 112) and two-thirds of the responding open country households (89 of 136) had encountered water service problems.

The most notable problems were inadequate or unreliable supply,

⁷The same sequence of tables is used for the "adequacy" data on each service.

⁸The total of 175 is obtained by summing the "total with problems" entries in the municipal and open country columns contained under the "problem most wanted to see eliminated" category of Table III-4. This value represents the total number of responding households with problems since each sampled household was allowed to list only one problem which it most wanted to see eliminated.

TABLE III-4. THE ADEQUACY OF WATER SERVICES — NUMBER OF HOUSEHOLDS RESPONDING, THREE COUNTY TOTAL

	Number Having this Problem in Last Three Years		Number Listing This Problem as the One They Most Wanted Eliminated		Number Willing to Pay to Eliminate this Problem		Number Willing to Pay Specified Amounts to Eliminate this Problem								Are You Getting Your Money's Worth? — by Type of Problem Wanted Eliminated									
	MUN	OC	MUN	OC	MUN	OC	No Estimate				Under \$5				\$5 to \$10				Yes		No		Don't Know	
							MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC
Hardness	35	50	15	22	6	7	2	1	3	1	0	4	1	1	12	20	0	1	3	1				
Off Color or Murky	29	6	12	4	4	2	2	0	1	0	1	2	0	0	10	3	2	1	0	0				
Undesirable Odor	18	6	4	2	2	1	0	0	1	0	1	0	0	1	4	2	0	0	0	0				
Iron	12	20	7	9	4	4	1	1	2	1	0	0	1	2	7	8	0	1	0	0				
Bacterial Contamination	1	4	0	2	0	2	0	1	0	1	0	0	0	0	0	2	0	0	0	0				
Too Much Salt or Other Minerals	7	11	3	5	1	0	1	0	0	0	0	0	0	0	3	5	0	0	0	0				
Unpleasant or Undesirable Taste	18	8	8	2	2	2	2	1	0	1	0	0	0	0	8	2	0	0	0	0				
System Failures	10	23	6	11	0	2	0	2	0	0	0	0	0	0	6	11	0	0	0	0				
Inadequate or Unreliable Supply	39	38	27	27	16	16	2	5	7	3	7	3	0	5	25	26	1	1	1	0				
Slow Repair or Maintenance Service	2	4	1	2	0	1	0	1	0	0	0	0	0	0	1	2	0	0	0	0				
Unreliable Repair or Maintenance	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
High Cost	3	2	3	2	0	1	0	1	0	0	0	0	0	0	2	2	1	0	0	0				
Other	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0				
SUBTOTAL	<u>112</u>	<u>136</u>	<u>86</u>	<u>89</u>	<u>35</u>	<u>38</u>	<u>10</u>	<u>13</u>	<u>14</u>	<u>7</u>	<u>9</u>	<u>9</u>	<u>2</u>	<u>9</u>	<u>78</u>	<u>83</u>	<u>4</u>	<u>5</u>	<u>4</u>	<u>1</u>				
None			<u>26</u>	<u>48</u>											<u>26</u>	<u>49</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>				
TOTAL			<u>112</u>	<u>136</u>											<u>104</u>	<u>132</u>	<u>4</u>	<u>5</u>	<u>4</u>	<u>1</u>				

^aNo entry is made since this total would represent the number of problems reported and not the number of responding households.

hardness, and iron.⁹ Inadequate or unreliable supply was the problem cited most frequently both as the problem most wanted eliminated and as the problem for which there was willingness to pay. Of the 77 households which had this problem in the last three years, 54 (70.1 percent) indicated that it was the problem they most wanted eliminated. Moreover, 32 of the households were willing to pay an additional amount to eliminate the problem. Especially significant findings are that 43.8 percent of the sampled households which were willing to pay extra (32 of 73) and 12.9 percent of all of the responding households (32 of 248) were willing to pay additional monthly amounts for adequate and/or reliable household water supplies. The severity of the water supply problem was probably influenced by the drought in South Dakota in 1976. The fact that approximately one of every eight sampled households was willing to pay an additional amount on a continuing monthly basis indicates that the water supply problem was a long-run problem and that the willingness to pay to correct the problem was consequently not entirely related to the drought which may be only a short- or intermediate-run problem.

As noted previously, hardness and iron were notable problems when considered individually (see Table III-4). A more revealing observation is to consider hardness and iron as part of a broad category of "water quality" problems. Included in this category are

⁹Off color or murky was a frequently mentioned problem but only among the municipal households of Grant County. Thus, this problem is considered in the discussion of the data from the Grant County subsample.

off color or murky, unpleasant odor, bacterial contamination, too much salt or other minerals, and bad taste. When considering the seven problems in such a manner, 95 of 175 households with problems (54.3 percent) cited "water quality" problems as those which they most wanted to see eliminated. In addition, 50.7 percent of those households willing to pay (37 of 73) wanted their additional expenditures to be used for the elimination of various "water quality" problems.

Considering some water problems as "water quality" problems and others as "water quantity" problems¹⁰ allows another interesting observation. Specifically, about the same number of responding households were willing to pay more to correct "quality" problems as were willing to pay to correct the "quantity" problem -- 37 and 34, respectively. However, only 38.9 percent of the households which most wanted to see a "quality" problem eliminated (37 of 95) were willing to pay extra to attempt to do so whereas 59.3 percent of those that most wanted to eliminate the "quantity" problem (34 of 54) were willing to pay more.

The total of 73 sampled households willing to pay additional monthly amounts accounted for 29.3 percent of the responding households. Slightly more than 31 percent of the sampled municipal households (35 of 112) and 27.7 percent of the responding open country households (38 of 137) were willing to pay extra for various water service problems. Only 3.6 percent of the sampled households (9 of 250)

¹⁰Inadequate or unreliable supply is referred to here as the "water quantity" problem.

indicated that they did not think that they were getting their money's worth from what they were "currently"¹¹ spending on water services.

The data varied among the three counties and between the locations within each county as to which problems were noteworthy. In Haakon County, the notable problems were hardness and inadequate or unreliable supply (see Table III-5). Ten of the 35 households in Haakon County listed hardness as the problem they most wanted eliminated and of these ten, five were willing to pay additional amounts monthly to eliminate the problem. Four of the 5 households with a willingness to pay to correct hardness were municipal households and these four accounted for one-half of the sampled municipal households in the county willing to pay extra.

Inadequate or unreliable supply was listed by eight households in Haakon County and was a problem in both municipal and open country areas. Seven of these 8 households were willing to pay additional amounts to eliminate this problem. Furthermore, 15 of the 34 responding households in Haakon County (44.1 percent) were willing to pay additional monthly amounts to eliminate various water service problems. None of the households indicated that they were not getting their money's worth from what they were spending on water services.

In Grant County, the most notable problems were inadequate or unreliable supply and off color or murky, the latter having been cited

¹¹When the terms "currently" or "current" are used in this thesis in relation to "... getting ... money's worth ...," these terms refer to interviewed households' expenditures at the time the interviews were conducted.

TABLE III-5. THE ADEQUACY OF HOUSEHOLD WATER SERVICES — NUMBER OF HOUSEHOLDS RESPONDING, HAAKON COUNTY

	Number Having this Problem in Last Three Years		Number Listing This Problem as the One They Most Wanted Eliminated		Number Willing to Pay to Eliminate this Problem		Number Willing to Pay Specified Amounts to Eliminate this Problem				Are You Getting Your Money's Worth? — by Type of Problem Wanted Eliminated									
							No Estimate		Under \$5		\$5 to \$10		Over \$10		Yes		No		Don't Know	
	MUN	CC	MUN	CC	MUN	CC	MUN	CC	MUN	CC	MUN	CC	MUN	CC	MUN	CC	MUN	CC	MUN	CC
Hardness	11	8	6	4	4	1	1	0	3	0	0	1	0	0	5	3	0	0	1	1
Off Color or Murky	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Undesirable Odor	6	1	2	1	1	1	0	0	0	0	1	0	0	1	2	1	0	0	0	0
Iron	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bacterial Contamination	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Too Much Salt or Other Minerals	1	2	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Unpleasant or Undesirable Taste	8	0	3	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0
System Failures	2	4	0	3	0	1	0	1	0	0	0	0	0	0	3	0	0	0	0	0
Inadequate or Unreliable Supply	5	7	4	4	3	4	1	0	1	1	1	2	0	4	4	0	0	0	0	0
Slow Repair or Maintenance Service	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unreliable Repair or Maintenance	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
High Cost	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	<u>—^a</u>	<u>—^a</u>	<u>15</u>	<u>13</u>	<u>8</u>	<u>7</u>	<u>2</u>	<u>1</u>	<u>4</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>0</u>	<u>14</u>	<u>12</u>	<u>0</u>	<u>0</u>	<u>1</u>	<u>1</u>	<u>1</u>
None			<u>1</u>	<u>5</u>										<u>1</u>	<u>6</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
TOTAL			<u>16</u>	<u>18</u>										<u>15</u>	<u>18</u>	<u>0</u>	<u>0</u>	<u>1</u>	<u>1</u>	<u>1</u>

^aNo entry is made since this total would represent the number of problems reported and not the number of responding households.

by municipal households only (see Table III-6). Of the 88 households which had problems, 33 indicated that inadequate or unreliable supply was the problem they would most like to see eliminated. Most of the 33 households were located in municipal areas. Seventeen households, 13 of which were municipal, indicated they were willing to pay extra to correct the supply problem. These 17 households represented 53.1 percent of all households which indicated a willingness to pay in Grant County. Also, 15.6 percent of all of the responding households in Grant County (17 of 109) were willing to pay an additional amount to relieve the household water supply problem. The fact that most of the households that were willing to pay to correct this particular problem were located in municipal locations is explained partly by Milbank's rapid population growth and partly by the drought which was very severe in Grant County. In combination the two factors put severe strains on the city's water supply sources. As a result, limited water rationing was imposed in Milbank in the summer of 1976.

As mentioned above, off color or murky was another notable problem but it was limited to municipal areas. Of the 27 Grant County sampled municipal households which responded that this had been a problem in the last three years, 12 (44.4 percent) considered it the problem they most wanted eliminated and four households were willing to pay extra to correct the problem.

Thirty-two of the 109 Grant County responding households (29.4 percent) were willing to pay extra. Only seven households (6.4 percent) did not think that they were getting their money's worth from what

TABLE III-6. THE ADEQUACY OF HOUSEHOLD WATER SERVICES — NUMBER OF HOUSEHOLDS RESPONDING, GRANT COUNTY

	Number Having this Problem in Last Three Years		Number Listing This Problem as the One They Most Wanted Eliminated		Number Willing to Pay to Eliminate this Problem		Number Willing to Pay Specified Amounts to Eliminate this Problem						Are You Getting Your Money's Worth? — by Type of Problem Wanted Eliminated							
	MUN OC		MUN OC		MUN OC		No Estimate		Under \$5		\$5 to \$10		Over \$10		Yes		No		Don't Know	
	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC
Hardness	13	18	2	4	0	1	0	0	0	0	0	1	0	0	0	4	0	0	2	0
Off Color or Murky	27	0	12	0	4	0	2	0	1	0	1	0	0	0	10	0	2	0	0	0
Undesirable Odor	9	4	2	1	1	0	0	0	1	0	0	0	0	0	2	1	0	0	0	0
Iron	6	11	2	6	0	2	0	1	0	0	0	0	0	1	2	5	0	1	0	0
Bacterial Contamination	1	2	0	1	0	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0
Too Much Salt or Other Minerals	5	3	2	1	1	0	1	0	0	0	0	0	0	0	2	1	0	0	0	0
Unpleasant or Undesirable Taste	7	5	4	1	2	1	2	1	0	0	0	0	0	0	4	1	0	0	0	0
System Failures	5	12	4	5	0	0	0	0	0	0	0	0	0	0	4	5	0	0	0	0
Inadequate or Unreliable Supply	33	16	22	11	13	4	1	1	6	1	6	1	0	1	20	10	1	1	1	0
Slow Repair or Maintenance Service	1	4	1	2	0	1	0	1	0	0	0	0	0	0	1	2	0	0	0	0
Unreliable Repair or Maintenance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
High Cost	3	1	3	1	0	1	0	1	0	0	0	0	0	0	2	1	1	0	0	0
Other	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
SUBTOTAL	<u>—^a</u>	<u>—^a</u>	<u>54</u>	<u>34</u>	<u>21</u>	<u>11</u>	<u>6</u>	<u>6</u>	<u>8</u>	<u>1</u>	<u>7</u>	<u>2</u>	<u>0</u>	<u>2</u>	<u>47</u>	<u>31</u>	<u>4</u>	<u>3</u>	<u>3</u>	<u>0</u>
None			8	13											8	14	0	0	0	0
TOTAL			<u>62</u>	<u>47</u>											<u>55</u>	<u>45</u>	<u>4</u>	<u>3</u>	<u>3</u>	<u>0</u>

^aNo entry is made since this total would represent the number of problems reported and not the number of responding households.

they were spending on household water services.

Relatively fewer sampled households in Brookings County had encountered household water service problems as compared to the other two counties. Just over 56 percent of the sampled households (59 of 105) had water service problems (see Table III-7). Of these, most considered either hardness, inadequate or unreliable supply, or iron to be their most important problem. Twenty-one of the 59 households with some kind of water problem responded that hardness was the problem they most wanted to see eliminated. Of these, seven were willing to pay extra to correct the problem.

Inadequate or unreliable supply was a problem limited mostly to sampled open country households in Brookings County. Twelve of the 42 open country households with problems (28.6 percent) listed the supply problem as that which they most wanted eliminated. Eight of these were willing to pay extra to eliminate the problem. Moreover, 40 percent of those open country households which indicated a willingness to pay specifically wanted to spend the additional amount to eliminate the household water supply problem. Eight households indicated iron as the problem they most wanted eliminated and six of these were willing to pay more to correct the problem.

Twenty-six Brookings County sampled households indicated a willingness to pay to eliminate various water service problems. Nearly equal proportions of these 26 respondents were from municipal and open country locations. Only two households responded that they were not getting their money's worth from what they had spent on

TABLE III-7. THE ADEQUACY OF HOUSEHOLD WATER SERVICES -- NUMBER OF HOUSEHOLDS RESPONDING, BROOKINGS COUNTY

	Number Having this Problem in Last Three Years		Number Listing This Problem as the One They Most Wanted Eliminated		Number Willing to Pay to Eliminate this Problem		Number Willing to Pay Specified Amounts to Eliminate this Problem				Are You Getting Your Money's Worth? -- by Type of Problem Wanted Eliminated									
							No Estimate		Under \$5		\$5 to \$10		Over \$10		Yes		No		Don't Know	
	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC
Hardness	11	24	7	14	2	5	1	1	0	1	0	2	1	1	7	13	0	1	0	0
Off Color or Murky	0	5	0	4	0	2	0	0	0	0	0	2	0	0	0	3	0	1	0	0
Undesirable Odor	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Iron	6	7	5	3	4	2	1	0	2	1	0	0	1	1	5	3	0	0	0	0
Bacterial Contamination	0	1	0	1	0	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0
Too Much Salt or Other Minerals	1	6	1	3	0	0	0	0	0	0	0	0	0	0	1	3	0	0	0	0
Unpleasant or Undesirable Taste	3	3	1	1	0	1	0	0	0	1	0	0	0	0	1	1	0	0	0	0
System Failures	3	7	2	3	0	1	0	1	0	0	0	0	0	0	2	3	0	0	0	0
Inadequate or Unreliable Supply	1	15	1	12	0	8	0	4	0	1	0	0	0	3	1	12	0	0	0	0
Slow Repair or Maintenance Service	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unreliable Repair or Maintenance	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
High Cost	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	<u>22</u> ^a	<u>22</u> ^a	<u>17</u>	<u>42</u>	<u>6</u>	<u>20</u>	<u>2</u>	<u>6</u>	<u>2</u>	<u>5</u>	<u>0</u>	<u>4</u>	<u>2</u>	<u>5</u>	<u>17</u>	<u>40</u>	<u>0</u>	<u>2</u>	<u>0</u>	<u>0</u>
None			<u>17</u>	<u>29</u>											<u>17</u>	<u>29</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
TOTAL			<u>34</u>	<u>71</u>											<u>34</u>	<u>69</u>	<u>0</u>	<u>2</u>	<u>0</u>	<u>0</u>

^aNo entry is made since this total would represent the number of problems reported and not the number of responding households.

household water services.

Sewage Disposal Services

The data reported and discussed on sewage disposal services pertains to the following topics: the principal sources of sewage disposal, the average monthly sewage disposal costs, and the adequacy of sewage disposal services.

Principal Sewage Disposal Sources

The type of sewage disposal system used was associated with a sampled household's location (see Table III-8). Approximately 85 percent of the sampled municipal households (95 of 112) indicated that

TABLE III-8. PRINCIPAL SOURCES OF SEWAGE DISPOSAL SERVICES BY LOCATION -- NUMBER OF HOUSEHOLDS RESPONDING

Type of System	Location		Total
	Municipal	Open Country	
Municipal	95	2	97
Private	17	136	153
Septic Tank	16	124	140
Cess Pool	1	2	3
Privy	<u>0</u>	<u>10</u>	<u>10</u>
TOTAL	112	138	250

their principal source of sewage disposal was a municipal system while 98.6 percent of all of the sampled open country households (136 of 138) utilized some type of a private system.

The most frequently listed type of private system was a septic tank. Of the 153 sampled households which utilized a private system,

140 (91.5 percent) employed a septic tank. Three sampled households reported the utilization of a private cess pool while ten sampled households had privies.¹²

Average Monthly Household Costs

The estimates given by the sampled households for average monthly sewage disposal costs were totaled and then averaged to arrive at the figures shown in Table III-9. The average cost figures reveal that sewage disposal costs were somewhat higher for the sampled municipal households of Haakon County than they were for the sampled municipal households of the other two counties.

TABLE III-9. AVERAGE MONTHLY SEWAGE DISPOSAL COSTS — BY COUNTY AND LOCATION

County	Municipal		Open Country	
	Average Monthly Cost	No Cost Estimate (Percent)	Average Monthly Cost	No Cost Estimate (Percent)
Haakon	\$3.13	0.0	\$3.31	5.3
Grant	2.50	8.1	1.00	47.9
Brookings	2.58	11.8	1.30	67.6

Based upon the available information, average monthly sewage disposal costs were greater for the responding open country households

¹²Sampled households which utilized a municipal system were also asked to identify the type of municipal system, i.e., treatment plant or lagoon. Since responses from sampled households which used the same municipal system were contradictory in many cases, these data were considered unreliable and therefore are not reported. This information would be accurate if obtained from the various municipal governments providing this service.

of Haakon County than for the open country households of Grant and Brookings Counties. However, the average costs for such households were perhaps higher than reported in Table III-9 since many of these households could not provide monthly depreciation costs as part of their estimates. The average costs presented in Table III-9, thus, reflect average monthly operating costs, as opposed to total costs inclusive of depreciation. Furthermore, the large number of "no cost estimates" in the open country areas of Grant County (47.9 percent) and Brookings County (67.6 percent) indicate that these cost estimates should be regarded with care. For these reasons, the average costs between municipal and open country areas are not discussed.

The Adequacy of Sewage Disposal Services

An important finding with respect to the consideration of the adequacy of sewage disposal services was that 62.2 percent of the responding households (155 of 249) had encountered no problems in the three years prior to the survey (see Table III-10).¹³ Furthermore, 88.4 percent of the responding households (220 of 249) were unwilling to pay anything extra for sewage disposal services. Only two sampled households (0.8 percent) indicated that they were not, in their opinion, getting their money's worth from their "current" expenditures on sewage disposal. One might tentatively conclude from these data that the

¹³Approximately 59 percent of the sampled municipal households (66 of 112) and 65.0 percent of the responding open country households (89 of 137) encountered no problems with sewage disposal.

TABLE III-10. THE ADEQUACY OF SEWAGE DISPOSAL SERVICES -- NUMBER OF HOUSEHOLDS RESPONDING, THREE COUNTY TOTAL

Problem	Number Having this Problem in Last Three Years		Number Listing This Problem as the One They Most Wanted Eliminated		Number Willing to Pay to Eliminate this Problem		Number Willing to Pay Specified Amounts to Eliminate this Problem				Are You Getting Your Money's Worth? -- by Type of Problem Wanted Eliminated								
	MUN	OC	MUN	OC	MUN	OC	Eliminate this Problem				Yes	No	Don't Know						
							No Estimate	Under \$5	\$5 to \$10	Over \$10				MUN	OC	MUN	OC		
Pipe Breaks	9	5	7	4	3	1	1	0	0	1	0	1	0	7	4	0	0	0	0
Odor	19	14	12	9	2	3	0	0	1	3	1	0	0	12	9	0	0	0	0
Plugging of Drain Pipes	21	18	19	16	5	5	0	1	3	1	2	2	0	18	16	0	0	1	0
System Failures	1	4	1	4	0	0	0	0	0	0	0	0	0	1	4	0	0	0	0
Inadequate System Capacity to Dispose of Your Sewage	9	4	5	2	3	1	0	1	2	0	1	0	0	4	2	0	0	1	0
Slow Repair or Maintenance Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unreliable Repair or Maintenance Services	0	2	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Overloaded Septic Tank Drainfield	2	8	1	7	1	2	0	0	1	1	0	1	0	1	7	0	0	0	0
Problems with Chemical Toilets	0	3	0	3	0	2	0	1	0	0	0	0	1	0	3	0	0	0	0
Other	1	2	1	2	1	0	0	0	1	0	0	0	0	1	2	0	0	0	0
SUBTOTAL	<u>1</u> ^a	<u>2</u> ^a	<u>4</u>	<u>48</u>	<u>15</u>	<u>14</u>	<u>1</u>	<u>4</u>	<u>8</u>	<u>5</u>	<u>5</u>	<u>3</u>	<u>1</u>	<u>44</u>	<u>48</u>	<u>0</u>	<u>0</u>	<u>2</u>	<u>0</u>
None			66	89										64	89	2	0	0	1
TOTAL			112	137										108	137	2	0	2	1

^aNo entry is made since this total would represent the number of problems reported and not the number of responding households.

sampled households were generally satisfied with existing sewage disposal services.

Conversely, a large proportion of the responding households (94 of 249, 37.8 percent) had encountered at least one sewage disposal problem in the last three years. This would suggest alternatively that sewage disposal services were inadequate. However, only 29 of the 249 responding households (11.6 percent) were willing to pay more than what they had been spending on this service. Furthermore, the willingness to pay extra was generally spread among several problems with no more than 4.0 percent of the responding households (10 of 249) willing to pay more to correct a specific problem. These latter two statements tend to refute the proposition that sewage disposal services were "inadequate."

The most apparent problem with sewage disposal was plugged drain pipes.¹⁴ Of the 39 households which had the problem, 35 indicated it was the problem they most wanted to see eliminated. Ten of the 35 households were willing to pay an additional amount to correct the problem. Slightly more than one-third of those households which expressed a willingness to pay (10 of 29) were willing to pay more to eliminate this problem. However, only 4.0 percent of all of the responding households were willing to pay extra to have the problem

¹⁴Based on the interviews this author had with households having this problem in Haakon and Grant Counties, drain pipes had generally been clogged by tree roots which had apparently "sought" moisture in the pipes. Since this writer did not conduct the majority of interviews in Brookings County, the same generalization cannot be applied to the entire sample.

corrected.

The importance of other problems was confined to particular locations in the three counties. In Haakon County, one-half of the responding households (17 of 34) in both municipal and open country locations had had at least one problem with sewage disposal (see Table III-11). One-half of the sampled municipal households which had encountered a problem in Haakon County (4 of 8) most wanted to have the problem of breaking pipes eliminated. Only one of these four was willing to pay more to correct the problem. In the open country survey of Haakon County, two problems were noteworthy. Three of the nine households with problems most wanted to have the plugging of drain pipes problem eliminated. Three households also most wanted to eliminate the problem of an overloaded septic tank drainfield.

Although 17.7 percent of the responding households in Haakon County (6 of 34) were willing to pay extra, no more than 5.5 percent (2 of 34) were willing to pay to correct a specific problem. (In this case, the problem was unpleasant odor.) The Haakon County subsample did, however, have the highest proportion of sampled households which were willing to pay additional amounts for the elimination of sewage disposal problems.

In Grant County, 39.1 percent of the sampled households (43 of 110) had experienced problems with sewage disposal (see Table III-12). Twenty-eight of the 62 sampled municipal households (45.2 percent) and 15 of the 48 sampled open country households (31.3 percent) had encountered problems.

TABLE III-11. THE ADEQUACY OF SEWAGE DISPOSAL SERVICES — NUMBER OF HOUSEHOLDS RESPONDING, HAAKON COUNTY

Problem	Number Having this Problem in Last Three Years		Number Listing This Problem as the One They Most Wanted Eliminated		Number Willing to Pay to Eliminate this Problem		Number Willing to Pay Specified Amounts to Eliminate this Problem						Are You Getting Your Money's Worth? — by Type of Problem Wanted Eliminated							
							No Estimate		Under \$5		\$5 to \$10		Over \$10		Yes		No		Don't Know	
	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC
Pipe Breaks	4	0	4	0	1	0	1	0	0	0	0	0	0	0	4	0	0	0	0	0
Odor	4	3	2	2	1	1	0	0	1	1	0	0	0	0	2	2	0	0	0	0
Plugging of Drain Pipes	1	4	1	3	0	1	0	0	0	0	0	1	0	1	3	0	0	0	0	
System Failures	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Inadequate System Capacity to Dispose of Your Sewage	1	0	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
Slow Repair or Maintenance Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Unreliable Repair or Maintenance Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Overloaded Septic Tank Drainfield	0	4	0	3	0	1	0	0	0	0	0	1	0	0	3	0	0	0	0	
Problems with Chemical Toilets	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Other	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	
SUBTOTAL	<u>11</u> ^a	<u>11</u> ^a	<u>8</u>	<u>9</u>	<u>3</u>	<u>3</u>	<u>1</u>	<u>0</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>2</u>	<u>0</u>	<u>7</u>	<u>9</u>	<u>0</u>	<u>0</u>	<u>1</u>	<u>0</u>	
None			<u>8</u>	<u>9</u>										<u>8</u>	<u>10</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	
TOTAL			<u>16</u>	<u>18</u>										<u>15</u>	<u>19</u>	<u>0</u>	<u>0</u>	<u>1</u>	<u>0</u>	

^aNo entry is made since this total would represent the number of problems reported and not the number of responding households.

TABLE III-12. THE ADEQUACY OF SEWAGE DISPOSAL SERVICES -- NUMBER OF HOUSEHOLDS RESPONDING, GRANT COUNTY

Problem	Number Having this Problem in Last Three Years		Number Listing This Problem as the One They Most Wanted Eliminated		Number Willing to Pay to Eliminate this Problem		Number Willing to Pay Specified Amounts to Eliminate this Problem				Are You Getting Your Money's Worth? -- by Type of Problem Wanted Eliminated							
	MUN	OC	MUN	OC	MUN	OC	No Estimate			Under \$5 to \$10		Over \$10		Yes		No	Don't Know	
							MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC
Pipe Breaks	4	0	2	0	1	0	0	0	0	1	0	0	0	2	0	0	0	0
Odor	13	5	9	4	1	1	0	0	0	1	1	0	0	9	4	0	0	0
Plugging of Drain Pipes	12	3	12	3	3	1	0	0	2	0	1	1	0	11	3	0	0	1
System Failures	0	3	0	3	0	0	0	0	0	0	0	0	0	0	3	0	0	0
Inadequate System Capacity to Dispose of Your Sewage	6	2	3	1	2	0	0	0	2	0	0	0	0	3	1	0	0	0
Slow Repair or Maintenance Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unreliable Repair or Maintenance Services	0	2	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Overloaded Septic Tank Drainfield	1	1	1	1	1	0	0	0	1	0	0	0	0	1	1	0	0	0
Problems with Chemical Toilets	0	2	0	2	0	2	0	1	0	0	0	0	1	0	2	0	0	0
Other	1	0	1	0	1	0	0	0	1	0	0	0	0	1	0	0	0	0
SUBTOTAL	<u>1</u> ^a	<u>0</u> ^a	<u>28</u>	<u>15</u>	<u>9</u>	<u>4</u>	<u>0</u>	<u>1</u>	<u>6</u>	<u>1</u>	<u>3</u>	<u>1</u>	<u>0</u>	<u>27</u>	<u>15</u>	<u>0</u>	<u>0</u>	<u>1</u>
None			<u>34</u>	<u>33</u>										<u>33</u>	<u>33</u>	<u>1</u>	<u>0</u>	<u>1</u>
TOTAL			<u>62</u>	<u>48</u>										<u>60</u>	<u>48</u>	<u>1</u>	<u>0</u>	<u>1</u>

^aNo entry is made since this total would represent the number of problems reported and not the number of responding households.

Notable problems in Grant County included plugging of drain pipes and unpleasant odor. Fifteen households (12 of which were municipal) indicated that clogged drain pipes was the problem they most wanted eliminated and four of these were willing to pay extra. Thirteen households most wanted to eliminate the unpleasant odor which resulted from failure of the sewage disposal process.¹⁵ Only two households were willing to pay extra to eradicate this problem.

Nearly 12 percent of all of Grant County's sampled households (13 of 110) were willing to pay extra amounts. About 15 percent of the sampled municipal households and only 8.3 percent of the sampled open country households were willing to pay more. No more than 3.6 percent of Grant County's sampled households were willing to pay more to correct any one problem -- this problem being plugging of drain pipes. Only one sampled household responded that it was not getting its money's worth from sewage disposal expenditures.

Thirty-four of the 105 sampled households (32.4 percent) in Brookings County had experienced sewage disposal problems (see Table III-13). As in the other county subsamples, plugging of drain pipes was the most notable problem with 16 of the 34 households with problems having indicated that this problem was the one they most wanted eliminated. Five of these 16 households were willing to pay extra which accounted for 50.0 percent of those willing to pay (5 of 10) but only 4.8 percent of those sampled (5 of 105). In total, only

¹⁵The cause of unpleasant odor is not known by this author and may not have been known by those who had the problem.

TABLE III-13. THE ADEQUACY OF SEWAGE DISPOSAL SERVICES -- NUMBER OF HOUSEHOLDS RESPONDING, BROCKINGS COUNTY

Problem	Number Having this Problem in Last Three Years		Number Listing This Problem as the One They Most Wanted Eliminated		Number Willing to Pay to Eliminate this Problem		Number Willing to Pay Specified Amounts to Eliminate this Problem				Are You Getting Your Money's Worth? -- by Type of Problem Wanted Eliminated									
							No Estimate		Under \$5		\$5 to \$10		Over \$10		Yes		No		Don't Know	
	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC
Pipe Breaks	2	5	1	4	1	1	0	1	0	0	0	0	1	0	1	4	0	0	0	0
Odor	2	6	1	3	0	1	0	0	0	1	0	0	0	0	1	3	0	0	0	0
Plugging of Drain Pipes	8	11	6	10	2	3	0	1	1	1	1	0	0	1	6	10	0	0	0	0
System Failures Inadequate System Capacity to Dispose of Your Sewage	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0
Slow Repair or Maintenance Services	2	2	1	1	0	1	0	1	0	0	0	0	0	0	1	1	0	0	0	0
Unreliable Repair or Maintenance Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Overloaded Septic Tank Drainfield	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Problems with Chemical Toilets	1	3	0	3	0	1	0	0	0	1	0	0	0	0	0	3	0	0	0	0
Other	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
SUBTOTAL	<u>0</u>	<u>1</u>	<u>10</u>	<u>24</u>	<u>3</u>	<u>7</u>	<u>0</u>	<u>3</u>	<u>1</u>	<u>3</u>	<u>1</u>	<u>0</u>	<u>1</u>	<u>1</u>	<u>10</u>	<u>24</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
None			24	47											23	46	1	0	0	1
TOTAL			<u>34</u>	<u>71</u>											<u>33</u>	<u>70</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>1</u>

*No entry is made since this total would represent the number of problems reported and not the number of responding households.

9.5 percent of Brookings County's sampled households (10 of 105) were willing to pay more and only one household thought that it was not getting its money's worth.

Solid Waste Management Services

Solid waste management includes both the collection and disposal of solid wastes. The different collection methods include municipal, commercial,¹⁶ and private hauling (in which case a household hauls its solid wastes to a disposal site). Among the methods of disposal are landfills, open dumps, and garbage shredders any of which may be publicly or privately operated.

Sampled households were requested to indicate their primary method of collection, the substitute collection systems available to them, their average monthly collection and disposal costs, and their perceptions on the adequacy of solid waste management services. The data pertaining to these questions are reported and discussed in the remainder of the chapter.

Principal Solid Waste Collection Methods

Of the different collection methods listed above, sampled

¹⁶Commercial collection of solid wastes in South Dakota is considered a community service in this thesis since the state of South Dakota governs the disposal of solid wastes in municipalities. Farmers and ranchers are exempt from this law provided they dispose of solid wastes on their own property and provided "... such disposal does not create a nuisance, a hazard to public health, or does not violate a local ordinance." See: South Dakota, South Dakota Compiled Laws, Annotated, 1967 (Indianapolis: The Allen Smith Company, 1974), Vol. XI, Title 34, Chapter 16A, Section 35.

municipal households generally utilized a "community"¹⁷ collection service (municipal or commercial) whereas open country households generally hauled their own solid wastes. These statements are supported by the data shown in Table III-14 which reveal that 92.0 percent of the

TABLE III-14. PRINCIPAL SOLID WASTE COLLECTION METHODS BY LOCATION AND COUNTY -- NUMBER OF HOUSEHOLDS RESPONDING

Location and County	Collection Method			Total
	Municipal Collection	Commercial Collection	Haul Own	
<u>Municipal:</u>				
Haakon	0	16	0	16
Grant	0	54	8	62
Brookings	<u>20</u>	<u>13</u>	<u>1</u>	<u>34</u>
SUBTOTAL	20	83	9	112
<u>Open Country:</u>				
Haakon	0	3	16	19
Grant	0	1	47	48
Brookings	<u>4</u>	<u>7</u>	<u>60</u>	<u>71</u>
SUBTOTAL	4	11	123	138
3 COUNTY TOTAL	24	94	132	250

sampled municipal households (103 of 112) employed a community collection service while 89.1 percent of the sampled open country households (123 of 138) hauled their own solid wastes. The fact that approximately one-tenth of the sampled open country households (15 of 138) were served by "community" collection services was partly due to those households' nearness to municipalities which had community collection services.

¹⁷The reader is referred to the definition of a "community" service in Chapter 1.

The most noticeable intercounty difference was that all those sampled households which listed a municipal collection service as their principal source were located in Brookings County. Another difference was that nearly all of those sampled municipal households which hauled their own solid wastes were from Grant County. In all three counties, sampled municipal households were generally served by community collection systems and sampled open country households hauled their own solid wastes.

Sampled households which hauled their solid wastes were also asked to identify the type of disposal site to which they hauled. The most frequently reported type of site was the private open dump which was listed by 46.2 percent of those hauling their own garbage (61 of 132).¹⁸ Other frequently mentioned types of disposal sites were municipal landfills (26 of 132, 19.7 percent), municipal open dumps (18 of 132, 13.6 percent), and private landfills (16 of 132, 12.1 percent).

Substitute Systems Available

Substitute systems include those listed as principal sources, i.e., municipal collection, commercial collection, and private hauling. With this particular service, it may be that participation in a particular solid waste management system was mandatory by force of law. In such instances, a consideration of substitutes, other than moving to a

¹⁸Of the 61 sampled households which utilized private open dumps, 59 were located in open country areas.

new jurisdiction, may be irrelevant. Also, several publicly owned disposal sites in Haakon County have been closed so that it has become economically unfeasible for municipal residents to haul their own solid wastes. Due to this fact and since open burning of solid wastes is prohibited by state law, most of Haakon County's municipal households participated in a commercial collection service which operated from Wall, South Dakota.

Fifty-eight percent of the sampled households (145 of 250) responded that there were no substitute solid waste collection and disposal systems available to them. Only 4.4 percent of the sampled households (11 of 250) indicated that a community collection system was available as a substitute. The remaining 37.6 percent of the sampled households (94 of 250) said that they could haul their own solid wastes to various kinds of sites. The most frequently listed substitute disposal site was the municipal landfill which was listed by 14.8 percent of the sampled households (37 of 250). The remaining sampled households listed other types of disposal sites with no more than 2.8 percent (7 of 250) having listed a particular type of disposal site other than a municipal landfill.

Average Monthly Household Costs

This subsection is divided into two parts. In the first part, the average monthly household costs of those sampled households which utilized municipal or commercial solid waste collection systems are discussed. The second part contains a discussion of the average monthly costs of those sampled households which provided for their own solid

waste collection and disposal.

Since most of the sampled households which used either municipal or commercial solid waste management systems were from municipalities, no comparison is made in Table III-15 between the average monthly costs

TABLE III-15. AVERAGE MONTHLY COSTS FOR SOLID WASTE MANAGEMENT BY COUNTY -- MUNICIPAL AND COMMERCIAL SYSTEMS^a

County	Type of System	
	Municipal	Commercial
Haakon	NA ^b	\$2.50
Grant	NA	2.50
Brookings	\$2.50	2.65

^aThere were relatively few "no cost estimate" responses.

^bNA signifies "not applicable" in this table and in all other tables where it is used in this thesis. The entries do not apply in this case since no sampled households in Haakon and Grant Counties indicated that they utilized a municipal system.

of a municipal and open country households. Rather, a comparison of the average monthly costs of municipal and commercial management system users is shown. Upon observation of Table III-15, it is immediately apparent that average monthly costs were nearly identical between systems and among the three counties. An average monthly cost of \$2.50 was the general rule.

Those sampled households which hauled their own solid wastes were requested to specify their average number of trips per month and their round trip mileage per trip. Since most sampled households which hauled found it difficult to estimate their costs for solid waste

management, average transportation costs were estimated by multiplying the number of trips per month times round trip mileage times an arbitrary amount of \$0.16 (per mile).¹⁹ These estimates were calculated for all of the 138 sampled households which hauled and the average figures are compiled in Table III-16.

TABLE III-16. SOLID WASTE HAULING STATISTICS -- BY LOCATION AND COUNTY

Location and County	Average Trips Per Month	Average Round Trip Mileage	Average Transportation Cost Per Month	Number of Households Reporting ^a
<u>Municipal:</u>				
Haakon	NA ^b	NA	NA	0
Grant	3.9	0.9	\$0.73	8
Brookings	0.2	1.8	0.05	1
<u>Open Country:</u>				
Haakon	3.6	1.6	\$1.03	16
Grant	1.7	3.1	0.66	47
Brookings	2.1	6.2	0.72	60

^aAll of the households that hauled their own garbage responded to this series of questions.

^bThe entries are inapplicable since no sampled municipal households in Haakon County hauled their own solid wastes.

It is difficult to make any definite transportation cost comparisons among locations or among counties since the average trips per month made by each household depended upon each household's needs

¹⁹The figure of \$0.16 per mile and other arbitrarily set figures for room rates, meals, and daily salary (see education and health care cost data in Chapter V) are those set by the North Central Regional Research Committee (NC-102).

and habits. Round trip mileage varied among households since some households merely burned their solid wastes within a close proximity to their homes while others hauled to various types of disposal sites which were further away. The data are reported since they may be useful (e.g.) for further research such as a benefit-cost analysis of the implementation of multi-household solid waste management services for open country areas.

The Adequacy of Solid Waste Management Services

It is revealed in Tables III-17, III-18, III-19, and III-20 that several of the frequently cited solid waste service problems were associated with particular counties or with particular locations. For example, lack of a convenient disposal site was listed by eight sampled households as that problem which they most wanted eliminated and 5 of the 8 households were willing to pay more to correct the problem (see Table III-17). Grant County accounted for 6 of the 8 households that most wanted this problem eliminated and for 3 of the 5 that were willing to pay more (see Table III-19). Moreover, all five households which were willing to pay were located in open country areas. As a second example, consider the problem of an unsightly dump. While all four sampled households which had the problem were willing to pay more, 3 of these 4 households were from the Brookings County subsample (see Tables III-17 and III-20).

The only notable problem which was not specifically identified with either a county or location was blowing refuse. Only 15.2 percent of the sampled households with problems (12 of 79) most wanted this

TABLE III-17. THE ADEQUACY OF SOLID WASTE MANAGEMENT SERVICES -- NUMBER OF HOUSEHOLDS RESPONDING, THREE COUNTY TOTAL

Problem	Number Having this Problem in Last Three Years		Number Listing This Problem as the One They Most Wanted Eliminated		Number Willing to Pay to Eliminate this Problem		Number Willing to Pay Specified Amounts to Eliminate this Problem								Are You Getting Your Money's Worth? -- by Type of Problem Wanted Eliminated					
							No Estimate		Under \$5		\$5 to \$10		Over \$10		Yes		No		Don't Know	
	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC
Odor	8	4	2	2	1	1	0	0	1	1	0	0	0	0	1	2	1	0	0	0
Blowing Refuse	14	9	4	8	2	1	1	0	1	0	0	1	0	4	7	0	0	0	0	1
Fires	3	6	0	5	0	1	0	0	0	0	0	1	0	0	5	0	0	0	0	0
Rats or Other Animals in Garbage Cans	12	3	4	2	2	2	0	0	1	2	1	0	0	3	2	1	0	0	0	0
Frequency of Collection	6	0	5	0	2	0	0	0	2	0	0	0	0	3	0	1	0	1	0	0
Lack of Convenient Disposal Site	3	6	3	5	0	5	0	0	0	4	0	1	0	2	5	0	0	1	0	0
Difficulty in Hauling Own Garbage	1	8	1	7	0	3	0	0	0	1	0	2	0	1	7	0	0	0	0	0
Unsanitary Dump	2	2	2	2	2	2	1	0	0	2	1	0	0	2	2	0	0	0	0	0
High Cost of Garbage Collection	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	4	0	1	0	0
Government Requirements Relative to Solid Waste	8	0	7	0	3	0	0	0	3	0	0	0	0	6	0	0	0	1	0	0
Inadequate, Inconvenient, or Incompetent Garbage Collection	16	2	9	1	1	1	0	0	1	0	0	1	0	4	1	4	0	1	0	0
Other	4	2	3	2	0	0	0	0	0	0	0	0	0	2	2	1	0	0	0	0
SUBTOTAL	<u>4</u>	<u>2</u> ^a	<u>45</u>	<u>34</u>	<u>13</u>	<u>16</u>	<u>2</u>	<u>0</u>	<u>9</u>	<u>10</u>	<u>2</u>	<u>6</u>	<u>0</u>	<u>23</u>	<u>33</u>	<u>12</u>	<u>0</u>	<u>5</u>	<u>1</u>	<u>1</u>
None			67	104										61	101	6	2	0	1	1
TOTAL			<u>112</u>	<u>138</u>										<u>89</u>	<u>134</u>	<u>18</u>	<u>2</u>	<u>5</u>	<u>2</u>	<u>2</u>

^aNo entry is made since this total would represent the number of problems reported and not the number of responding households.

problem eliminated and only three sampled households were willing to pay more to eliminate it.

Some problems, however, were noteworthy in reference to either municipal or open country locations. Notable problems for the sampled municipal households were inadequate, inconvenient, or incompetent garbage collection, government requirements relative to solid waste, and high costs. One-fifth of the sampled households with problems (9 of 45) most wanted to eliminate inadequate, inconvenient, or incompetent garbage collection. While only one of these was willing to pay more, it is important to note that 4 of these 9 households did not think that they were getting their money's worth. Seven sampled municipal households most wanted to eliminate various government regulations dealing with solid waste management. These households were specifically dissatisfied with laws and/or ordinances which required that they participate in a "community" solid waste management service. Three of these 7 households were willing to pay more to change this situation but none of them thought that they were not getting their money's worth. Five municipal households listed the high cost of garbage collection as the problem they most wanted eliminated and 4 of these 5 indicated that they were not getting their money's worth from their expenditures on solid waste management. The five households were composed of elderly adults who did not think that they should have to pay as much as other households because they had smaller amounts of solid wastes that had to be collected. As one might suspect, none of these households were willing to pay extra to correct the problem.

Notable problems among the open country sampled households were lack of a convenient disposal site and difficulties in hauling garbage. Of the 34 open country households with problems, five most wanted to correct the problem of lack of a convenient disposal site. As mentioned previously, all five of these households were willing to pay extra. These five households accounted for 3.8 percent of all the sampled open country households (5 of 138). Seven sampled open country households most wanted to eliminate their problems with hauling their own garbage but only three households were willing to pay more to do so.

Overall, 31.6 percent of all of the sampled households (79 of 250) had encountered one or more solid waste management problems but only 7.6 percent of the sampled households (19 of 250) were willing to pay more to eliminate various problems. No more than 2.0 percent (5 of 250) were willing to pay additional amounts to correct a specific problem. Eight percent of the sampled households (20 of 250) thought that they were not getting their money's worth, although most of these were municipal households. These figures indicate that solid waste management services were generally adequate but that a fairly sizable number of sampled households thought that they were paying more than what they should for the benefits they were receiving.

Analysis of the data in Tables III-18, III-19, and III-20 reveals that there were different problems which were of importance to each county. In Haakon County, it is somewhat difficult to argue that there were any problems of "importance" since no more than one household was willing to pay extra to correct any particular problem (see Table III-18).

TABLE III-18. THE ADEQUACY OF SOLID WASTE MANAGEMENT SERVICES — NUMBER OF HOUSEHOLDS RESPONDING, HAAKON COUNTY

Problem	Number Having this Problem in Last Three Years		Number Listing This Problem as the One They Most Wanted Eliminated		Number Willing to Pay to Eliminate this Problem		Number Willing to Pay Specified Amounts to Eliminate this Problem						Are You Getting Your Money's Worth? -- by Type of Problem Wanted Eliminated								
							No Estimate		Under \$5		\$5 to \$10		Over \$10		Yes		No		Don't Know		
	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	
Odor	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Blowing Refuse	1	4	0	4	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0
Fires	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rats or Other Animals in Garbage Cans	3	0	2	0	1	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	0
Frequency of Collection	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lack of Convenient Disposal Site	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Difficulty in Hauling Own Garbage	0	2	0	2	0	1	0	0	0	0	1	0	0	0	2	0	0	0	0	0	0
Unsightly Dump	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
High Cost of Garbage Collection	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Government Requirements Relative to Solid Waste	4	0	3	0	1	0	0	0	1	0	0	0	0	0	3	0	0	0	0	0	0
Inadequate, Inconvenient, or Incompetent Garbage Collection	2	1	2	1	0	1	0	0	0	0	1	0	0	0	1	2	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	<u>0</u> ^a	<u>0</u> ^a	<u>8</u>	<u>7</u>	<u>2</u>	<u>2</u>	<u>0</u>	<u>0</u>	<u>1</u>	<u>0</u>	<u>1</u>	<u>2</u>	<u>0</u>	<u>0</u>	<u>4</u>	<u>7</u>	<u>4</u>	<u>0</u>	<u>6</u>	<u>0</u>	<u>0</u>
None			8	12											7	12	1	0	0	0	0
TOTAL			16	19											11	19	5	0	0	0	0

^aNo entry is made since this total would represent the number of problems reported and not the number of responding households.

Approximately one-fifth (4 of 19) of the Haakon County open country sampled households most wanted the blowing refuse problem eliminated although none were willing to pay more to correct the problem. Three of the 35 households in Haakon County most wanted to have the problem of inadequate, inconvenient, or incompetent garbage collection eliminated but only one household was willing to pay extra. While 15 of the sampled households in the county listed a problem which they most wanted to see eliminated, only four were willing to pay extra monthly amounts to correct various problems. Approximately one-ninth of the Haakon County households thought that they were not getting their money's worth with respect to solid waste management.

In Grant County, 40.9 percent of the sampled households (45 of 110) had encountered one or more problems although a larger proportion of the sampled municipal households had had problems as compared to the sampled open country households (see Table III-19). Approximately 15 percent of the sampled households in the county (16 of 110) were willing to spend additional amounts to eliminate various problems. The notable problems in the county were blowing refuse, lack of a convenient disposal site, and unsightly dump. Six of the 45 households which had encountered problems indicated that blowing refuse was the problem they most wanted to see eliminated. One-half of these six households were willing to pay extra to eliminate the problem. Six households complained of the lack of a convenient disposal site although the three households which indicated a willingness to pay were from the open country area of Grant County. While only 3 of the 110 sampled households indicated

TABLE III-19. THE ADEQUACY OF SOLID WASTE MANAGEMENT SERVICES — NUMBER OF HOUSEHOLDS RESPONDING, GRANT COUNTY

Problem	Number Having this Problem in Last Three Years		Number Listing This Problem as the One They Most Wanted Eliminated		Number Willing to Pay to Eliminate this Problem		Number Willing to Pay Specified Amounts to Eliminate this Problem								Are You Getting Your Money's Worth? — by Type of Problem Wanted Eliminated						
	MUN	OC	MUN	OC	MUN	OC	No Estimate		Under \$5		\$5 to \$10		Over \$10		Yes		No		Don't Know		
							MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN
Odor	7	2	2	2	1	1	0	0	1	1	0	0	0	0	0	1	2	1	0	0	0
Blowing Refuse	10	5	3	3	2	1	1	0	1	0	0	1	0	0	3	3	0	0	0	0	
Fires	3	2	0	2	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	
Rats or Other Animals in Garbage Cans	8	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	
Frequency of Collection	4	0	4	0	2	0	0	0	2	0	0	0	0	0	3	0	0	0	1	0	
Lack of Convenient Disposal Site	3	3	3	3	0	3	0	0	0	3	0	0	0	0	2	3	0	0	1	0	
Difficulty in Hauling Own Garbage	1	4	1	3	0	0	0	0	0	0	0	0	0	1	3	0	0	0	0	0	
Unsanitary Dump	2	1	2	1	2	1	1	0	0	1	1	0	0	2	1	0	0	0	0	0	
High Cost of Garbage Collection	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	
Government Requirements Relative to Solid Waste	4	0	4	0	2	0	0	0	2	0	0	0	0	3	0	0	0	0	1	0	
Inadequate, Inconvenient, or Incompetent Garbage Collection	11	1	5	0	1	0	0	0	1	0	0	0	0	4	0	0	0	0	1	0	
Other	3	0	3	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	0	
SUBTOTAL	<u>3</u> ^a	<u>0</u> ^a	<u>31</u>	<u>14</u>	<u>10</u>	<u>6</u>	<u>2</u>	<u>0</u>	<u>7</u>	<u>5</u>	<u>1</u>	<u>1</u>	<u>0</u>	<u>22</u>	<u>14</u>	<u>4</u>	<u>0</u>	<u>5</u>	<u>0</u>	<u>0</u>	
None			<u>31</u>	<u>34</u>										<u>29</u>	<u>34</u>	<u>2</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	
TOTAL			<u>62</u>	<u>48</u>										<u>51</u>	<u>48</u>	<u>6</u>	<u>0</u>	<u>5</u>	<u>0</u>	<u>0</u>	

^aNo entry is made since this total would represent the number of problems reported and not the number of responding households.

that an unsightly dump was a problem they had had in the prior three years, all three indicated that it was the problem they most wanted eliminated. Also, all three were willing to pay to correct the situation. Hence, 9 of the 16 sampled households willing to pay in the county wanted to pay the additional amount to correct the three problems noted above. Finally, 4 of the 62 sampled municipal households in Grant County responded that they were not getting their money's worth from solid waste management services.

The most revealing data from the Brookings County subsample were those which showed that only 17.6 percent of the households (6 of 34) in the county's municipalities had encountered any problems and only one household was willing to pay an additional amount (see Table III-20). Three problems were noteworthy in the open country area. Six of the 13 sampled open country households with one or more problems were evenly divided as to which of the following three problems they most wanted to have eliminated: rats or other animals in garbage cans, lack of a convenient disposal site, and difficulties in hauling one's own garbage. All six households were willing to pay an extra monthly amount to correct these problems. Only two of the other households in the open country were willing to pay extra to eliminate other problems. Four of the 34 sampled municipal households did not think that they were getting their money's worth from their expenditures on this particular service.

Summary

The survey results pertaining to three services -- household

TABLE III-20. THE ADEQUACY OF SOLID WASTE MANAGEMENT SERVICES — NUMBER OF HOUSEHOLDS RESPONDING, BROCKINGS COUNTY

Problem	Number Having this Problem in Last Three Years		Number Listing This Problem as the One They Most Wanted Eliminated		Number Willing to Pay to Eliminate this Problem		Number Willing to Pay Specified Amounts to Eliminate this Problem								Are You Getting Your Money's Worth? — by Type of Problem Wanted Eliminated							
	MUN	OC	MUN	OC	MUN	OC	No Estimate		Under \$5		\$5 to \$10		Over \$10		Yes		No		Don't Know			
							MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC
Odor	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Blowing Refuse	3	2	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Fires	0	3	0	3	0	1	0	0	0	0	0	1	0	0	0	3	0	0	0	0	0	0
Rats or Other Animals in Garbage Cans	1	2	1	2	1	2	0	0	1	2	0	0	0	0	1	2	0	0	0	0	0	0
Frequency of Collection	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Lack of Convenient Disposal Site	0	3	0	2	0	2	0	0	0	1	0	1	0	0	0	2	0	0	0	0	0	0
Difficulty in Hauling Own Garbage	0	2	0	2	0	2	0	0	0	1	0	1	0	0	0	2	0	0	0	0	0	0
Unightly Dump	0	1	0	1	0	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0
High Cost of Garbage Collection	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Government Requirements Relative to Solid Waste	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Inadequate, Inconvenient, or Incompetent Garbage Collection	3	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
Other	1	2	0	2	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
SUBTOTAL	11	12	6	13	1	8	0	0	1	5	3	3	0	0	2	12	4	0	0	0	0	1
None			28	58											25	55	3	2	0	0	1	
TOTAL			34	71											27	67	7	2	0	0	2	

^aNo entry is made since this total would represent the number of problems reported and not the number of responding households.

water, sewage disposal, and solid waste management -- were presented in this chapter. Households' responses on the following aspects of each service were tabulated and discussed: the systems used as the principal sources of provision, the available substitute service systems (household water and solid waste management only), the average monthly service costs, and the adequacy of the services.

Of particular interest were data concerning the adequacy of each service. For instance, 70.6 percent, 37.8 percent, and 31.6 percent of the responding households had encountered one or more problems with household water services, sewage disposal services, and solid waste management services, respectively. While 29.4 percent of the responding households were willing to pay more to correct various household water service problems, only 11.6 percent were willing to pay more for problems associated with each of the other two services. Moreover, a much larger percentage of the responding households were willing to pay extra to eliminate a specific household water service problem than were willing to pay to correct any of the listed problems with the other two services. That is, 12.9 percent were willing to pay extra for adequate and/or reliable household water supplies while only 4.0 percent and 2.0 percent were willing to pay extra to eliminate plugged drain pipes (sewage disposal) and the lack of convenient disposal sites (solid waste management), respectively. These findings suggest that, of these three services, household water services were the least adequate according to the aggregation of sampled household responses.

CHAPTER IV

PROTECTIVE SERVICES: FIRE PROTECTION AND LAW ENFORCEMENT

Fire protection and law enforcement are discussed in this chapter. These services have traditionally been provided by the public sector, however, both services have private substitutes available. Specifically, both services can be characterized by excludability so that payment gives an individual property rights to the service. For example, one can provide for his own fire protection by purchasing fire extinguishers, sprinkler systems, smoke and fire detection equipment, or by organizing neighborhood groups to extinguish a potential fire. In a similar manner, one can provide for his own property protection by hiring a bodyguard, installing a burglar alarm system, or organizing neighborhood groups. With the presence of publicly provided fire protection and law enforcement services, the degree to which privately provided services are needed would be inversely related to the effectiveness of the complementary public services.

The consumption of both services (whether provided publicly or privately) may be nonrival. With respect to fire protection, successfully extinguishing a fire in an individual's home does not preclude his neighbors from enjoying a similar service: the protection of their homes from a spreading fire. Similarly, the reduction of the threat to life and property brought about by protection of one's residence is not restricted to that property but benefits all those in the neighborhood.

If the two services are publicly provided, they may be

considered to possess the public good characteristics of nonexcludability and nonrivalry. Consumption is not made contingent upon payment for the services and hence, both services may be financed through funding from general revenue sources.

Publicly provided fire protection services may also be financed by donations, fund raising, and special fees (for example) for fire protection responses to rural areas. The latter form of financing suggests that there may be some exclusion possible with this service. Regardless of whether exclusion is possible, it may be that this service was originally publicly provided due to nonrivalry and/or perceived efficiencies brought about by government involvement.

The two services may differ as to labor intensity. In sparsely populated areas, law enforcement may be more labor intensive than fire protection and hence, the problems encountered by households may be more labor-related. The remainder of the chapter is devoted to the survey results on fire protection and law enforcement.

Fire Protection Services

Sampled households were asked to specify the principal source of their fire protection, the methods used in financing their fire protection, the number of times they had utilized fire protection services in the last three years, the amount of time that was required in order for them to obtain fire protection assistance, and the adequacy of their fire protection services. The results are reported and discussed in this section.

Principal Sources of Fire Protection Services

The most common fire protection systems were municipal fire departments, rural fire departments, and combined municipal-rural fire departments. Other sources of fire protection were informal neighborhood groups or households' personal efforts. All of the sampled municipal households indicated that their principal source of fire protection was a municipal fire department.¹ As shown in Table IV-1, most of the

TABLE IV-1. PRINCIPAL SOURCES OF FIRE PROTECTION BY COUNTY -- NUMBER OF OPEN COUNTRY HOUSEHOLDS RESPONDING

County	Principal Source				Total
	Municipal Fire Department	Rural Fire Department	Combined Municipal-Rural Fire Department	Personal Efforts	
Haakon	6	3	8	2	19
Grant	10	0	38	0	48
Brookings	<u>29</u>	<u>6</u>	<u>36</u>	<u>0</u>	<u>71</u>
TOTAL	45	9	82	2	138

sampled open country households relied on a combined municipal-rural fire department as their principal source of provision whereas a lesser yet large, number of the sampled open country households indicated

¹Municipal households considered the fire department located in their respective municipalities as being strictly "municipal" even though, in some cases, the fire department may have been a combined municipal-rural fire department. On the other hand, some of those fire departments which open country households indicated were combined municipal-rural fire departments may have been only municipal fire departments. The service area of a municipal fire department, except in emergencies or where some sharing agreements have been arranged, is defined by its respective city limits. The service area of a combined municipal-rural fire department encompasses both the municipal and designated rural area.

that a municipal fire department was their principal source. Relatively few of the sampled open country households indicated that a rural fire department or "personal efforts" were their principal sources of fire protection. Since only two responding households indicated that they relied mostly on their personal efforts for fire protection, the remainder of the discussion on fire protection deals only with "organized"² fire protection services.

Fire Protection Financing Methods

The sampled households were asked to identify those methods which were used to finance their fire protection service.³ Approximately 94 percent of the sampled households indicated that "donations or fund raising" was at least one of the methods of financing. Slightly more than 60 percent cited taxation as one of the financing methods. Finally, special fees were included by 30 percent of the sampled households.

Frequency of Use and Response Time

Fire protection is unlike the previous services in that it is employed only in the rare event of a fire or other emergency. Thus, it is useful to discover not only how many households have had fires in the

²"Organized" fire protection services are those fire departments which serve an aggregation of households, e.g., a municipal fire department.

³The households were not asked what proportion of the budget of the fire protection service was accounted for by any particular method. To obtain such information would require a survey of the service suppliers.

last three years, but also whether a fire department responded and its corresponding response time.

Although 10.0 percent of the sampled households (25 of 250) had had fires in the last three years, 76.0 percent of these (19 of 25) were in open country areas. In each case, a fire department was called and in only one instance a fire department did not respond. In 20 of the 24 cases in which a fire department had responded, the response time was less than 15 minutes. The response time was from 15 minutes to 30 minutes in three cases, all of which were in Grant County. One household reported that it took the fire department from one-half hour to one hour to respond.

From the foregoing, it would appear that fire departments were generally able to respond rather quickly when their assistance was requested. Consideration of whether fire departments responded and the time required in responding does not yield information on households' evaluations of the fire protection assistance rendered. Hence, information as to households' opinions on the adequacy of their fire protection services is necessary.

The Adequacy of Fire Protection Services

A large majority of the responding households had encountered no problems with fire protection in the last three years. Only 20.1 percent of all of the responding households (52 of 248) and not more than 27.5 percent of the responding households in any county (30 of 109 in Grant County) had encountered problems with fire protection (see Tables IV-2 and IV-4). In fact, only 7.7 percent of the responding

TABLE IV-2. THE ADEQUACY OF FIRE PROTECTION SERVICES — NUMBER OF HOUSEHOLDS RESPONDING, THREE COUNTY TOTAL

Problem	Number Having this Problem in Last Three Years		Number Listing This Problem as the One They Most Wanted Eliminated		Number Willing to Pay to Eliminate this Problem		Number Willing to Pay Specified Amounts to Eliminate this Problem						Are You Getting Your Money's Worth? -- by Type of Problem Wanted Eliminated								
							No Estimate		Under \$5		\$5 to \$10		Over \$10		Yes		No		Don't Know		
	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	
Poor Organization	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Insufficient Water Supply	11	8	11	6	6	3	1	2	5	1	0	0	0	0	10	6	0	0	1	0	0
Faulty Equipment	1	5	1	2	0	2	0	0	0	1	0	1	0	0	0	2	1	0	0	0	0
Lack of Adequate Equipment	4	0	3	0	3	0	0	0	2	0	0	0	1	0	3	0	0	0	0	0	0
No Fast Way to Report Fires	2	5	2	5	0	1	0	0	0	1	0	0	0	0	0	5	0	0	2	0	0
Slow Response	1	22	1	18	0	4	0	2	0	0	0	2	0	0	18	0	0	1	0	0	0
Other	2	2	1	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0
SUBTOTAL	<u>22</u> ^a	<u>22</u> ^a	19	33	9	10	1	4	7	3	0	3	1	0	14	33	1	0	4	0	0
None			92	104											91	96	0	1	2	7	7
TOTAL			111	137											105	129	1	1	6	7	7

^aNo entry is made since this total would represent the number of problems reported and not the number of responding households.

households (19 of 248) were willing to pay more in order to eliminate the various problems encountered. Only two households expressed the view that they were not getting their money's worth from their "current" expenditures on fire protection. These findings suggest that the responding households were generally satisfied with fire protection services.⁴

Two problems warrant discussion -- insufficient water supply and slow response. The insufficient water supply problem was partly due to the 1976 drought but was also the result of the low water-carrying capacity of some "fire trucks." Seventeen of the 52 responding households with problems stated that the problem they most wanted eliminated was insufficient water supply. Nine of these 17 households were willing to pay more to correct the problem. However, only 3.6 percent of all of the responding households (9 of 248) were willing to pay additional monthly amounts for a more sufficient water supply for fire protection.

Slow response was a problem which was associated almost entirely with the sampled households in open country areas. This may have been the case because of the longer distance which had to be traveled by fire fighters in order to respond to an open country call. Eighteen of the 33 open country households with at least one problem indicated that

⁴One might argue that those households which had requested assistance to extinguish fires would have more accurate impressions on the adequacy of fire protection services. Of the 25 households that had requested such assistance, only eight (32.0 percent) indicated that they had encountered problems and only three (12.0 percent) were willing to pay more. Although these percentages are somewhat higher than those corresponding to the total sample, they are not so high as to contradict the conclusion concerning general satisfaction with fire protection services.

slow response was the problem they most wanted eliminated. Four of these households were willing to pay extra to correct the problem. Six households were also willing to pay extra to correct other specific problems.

In Tables IV-3, IV-4, and IV-5, one finds that in some areas relatively few of the responding households had encountered problems with fire protection. For instance, only 6.3 percent of the municipal households in Haakon County (1 of 16), 8.8 percent of the municipal households in Brookings County (3 of 34), and 14.3 percent of the open country households in Brookings County (10 of 70) had responded that they had had fire protection problems. Conversely, 42.1 percent of the Haakon County open country households (8 of 19) and approximately one-fourth and one-third of the municipal and open country households of Grant County, respectively, had encountered problems.

A notable problem among the sampled open country households of Haakon County was slow response (see Table IV-3). Of the eight open country households with problems in the Haakon County subsample, five most wanted to eliminate the problem of slow response although none of these were willing to pay more to do so.

Analysis of Table IV-4 reveals that those problems cited most frequently in Grant County were associated with the sampled households in a particular location (municipal or open country). Among the responding municipal households of Grant County the notable problems were insufficient water supply and lack of adequate equipment. Of the 15 municipal households which had encountered problems, ten most wanted

TABLE IV-3. THE ADEQUACY OF FIRE PROTECTION SERVICES -- NUMBER OF HOUSEHOLDS RESPONDING, HAAKON COUNTY

Problem	Number Having this Problem in Last Three Years		Number Listing This Problem as the One They Most Wanted Eliminated		Number Willing to Pay to Eliminate this Problem		Number Willing to Pay Specified Amounts to Eliminate this Problem								Are You Getting Your Money's Worth? -- by Type of Problem Wanted Eliminated					
	MUN	OC	MUN	OC	MUN	OC	No Estimate		Under \$5		\$5 to \$10		Over \$10		Yes		No		Don't Know	
							MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC
Poor Organization	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Insufficient Water Supply	1	2	1	1	1	1	0	1	1	0	0	0	0	0	1	1	0	0	0	0
Faulty Equipment	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lack of Adequate Equipment	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
No Fast Way to Report Fires	0	1	0	1	0	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0
Slow Response	0	7	0	5	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	
Other	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
SUBTOTAL	<u>1</u> ^a	<u>1</u> ^a	<u>1</u>	<u>8</u>	<u>1</u>	<u>2</u>	<u>0</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>1</u>	<u>8</u>	<u>0</u>	<u>0</u>	<u>0</u>	
None			<u>15</u>	<u>11</u>										<u>14</u>	<u>11</u>	<u>0</u>	<u>0</u>	<u>1</u>	<u>0</u>	
TOTAL			<u>16</u>	<u>19</u>										<u>15</u>	<u>19</u>	<u>0</u>	<u>0</u>	<u>1</u>	<u>0</u>	

^aNo entry is made since this total would represent the number of problems reported and not the number of responding households.

TABLE IV-4. THE ADEQUACY OF FIRE PROTECTION SERVICES — NUMBER OF HOUSEHOLDS RESPONDING, GRANT COUNTY

Problem	Number Having this Problem in Last Three Years		Number Listing This Problem as the One They Most Wanted Eliminated		Number Willing to Pay to Eliminate this Problem		Number Willing to Pay Specified Amounts to Eliminate this Problem								Are You Getting Your Money's Worth? -- by Type of Problem Wanted Eliminated					
							No Estimate		Under \$5		\$5 to \$10		Over \$10		Yes		No		Don't Know	
	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC
Poor Organization	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Insufficient Water Supply	10	2	10	1	5	0	1	0	4	0	0	0	0	0	9	1	0	0	1	0
Faulty Equipment	0	3	0	2	0	2	0	0	0	1	0	1	0	0	0	2	0	0	0	0
Lack of Adequate Equipment	3	0	3	0	3	0	0	0	2	0	0	0	1	0	3	0	0	0	0	0
No Fast Way to Report Fires	1	2	1	2	0	0	0	0	0	0	0	0	0	0	0	2	0	0	1	0
Slow Response	0	10	0	9	0	3	0	1	0	0	0	2	0	0	0	9	0	0	0	0
Other	2	1	1	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0
SubTOTAL	<u>2</u> ^a	<u>1</u> ^a	<u>15</u>	<u>15</u>	<u>8</u>	<u>5</u>	<u>1</u>	<u>1</u>	<u>6</u>	<u>1</u>	<u>0</u>	<u>3</u>	<u>1</u>	<u>0</u>	<u>13</u>	<u>15</u>	<u>0</u>	<u>0</u>	<u>2</u>	<u>0</u>
Note			<u>46</u>	<u>33</u>											<u>46</u>	<u>30</u>	<u>0</u>	<u>0</u>	<u>1</u>	<u>3</u>
TOTAL			<u>61</u>	<u>48</u>											<u>59</u>	<u>45</u>	<u>0</u>	<u>0</u>	<u>3</u>	<u>3</u>

^aNo entry is made since this total would represent the number of problems reported and not the number of responding households.

to have the insufficient water supply problem eliminated while three most wanted to eliminate the problem of the lack of adequate equipment. Moreover, of the eight responding municipal households willing to pay extra, five were willing to pay more for a sufficient water supply and three were willing to pay for more fire protection equipment. Overall, these eight households which were willing to pay accounted for only 13.1 percent of the responding municipal households in Grant County (8 of 61). The only notable problem among the sampled open country households of Grant County was slow response. Sixty percent of those sampled households with problems in the open country area (9 of 15) most wanted to eliminate the slow responses of local fire departments. However, only 6.3 percent of the sampled open country households of Grant County (3 of 48) were willing to pay to correct the problem.

Among the responding households in Brookings County, only three were willing to pay additional monthly amounts for the elimination of fire protection problems (see Table IV-5). None of the sampled municipal households in the county were willing to pay more.

The county data support the earlier suggestion that the responding households were generally satisfied with fire protection services. No more than 11.9 percent of the responding households in any county were willing to pay extra.

Law Enforcement Services

In addition to the series of questions on "adequacy," sampled households were requested to indicate the availability of law enforcement services, the accessibility of such services, and their utilization

TABLE IV-5. THE ADEQUACY OF FIRE PROTECTION SERVICES — NUMBER OF HOUSEHOLDS RESPONDING, BROOKINGS COUNTY

Problem	Number Having this Problem in Last Three Years		Number Listing This Problem as the One They Most Wanted Eliminated		Number Willing to Pay to Eliminate this Problem		Number Willing to Pay Specified Amounts to Eliminate this Problem				Are You Getting Your Money's Worth? -- by Type of Problem Wanted Eliminated									
							No Estimate		Under \$5		\$5 to \$10		Over \$10		Yes		No		Don't Know	
	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC
Poor Organization	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Insufficient Water Supply	0	4	0	4	0	2	0	1	0	1	0	0	0	0	0	4	0	0	0	0
Faulty Equipment	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Lack of Adequate Equipment	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
No Fast Way to Report Fires	1	2	1	2	0	0	0	0	0	0	0	0	0	0	2	0	0	1	0	0
Slow Response	1	5	1	4	0	1	0	1	0	0	0	0	0	0	4	0	0	1	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	<u>0</u>	<u>0</u>	<u>3</u>	<u>10</u>	<u>0</u>	<u>3</u>	<u>0</u>	<u>2</u>	<u>0</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>10</u>	<u>1</u>	<u>0</u>	<u>2</u>	<u>0</u>	<u>0</u>
None			31	60											31	55	0	1	0	4
TOTAL			34	70											31	65	1	1	2	4

^aNo entry is made since this total would represent the number of problems reported and not the number of responding households.

of such services. The discussion of the sample data follows.

Types of Law Enforcement Services Available

Based upon the sample data, the most common types of non-reservation law enforcement service systems were municipal police departments, the state Highway Patrol, and county sheriffs' departments. The availability of any of these services to various households depended upon the jurisdiction of each law enforcement agency. Thus, some responding households indicated that two or more types of law enforcement services were available while other households reported that only one type of service, typically a county sheriff's department, was available (see Table IV-6).⁵

TABLE IV-6. TYPES OF LAW ENFORCEMENT SERVICES AVAILABLE BY LOCATION -- NUMBER OF HOUSEHOLDS RESPONDING

Location	Municipal Police Department	State Highway Patrol	County Sheriff's Department	Other ^a
Municipal	97	106	109	2
Open Country	<u>12</u>	<u>107</u>	<u>137</u>	<u>5</u>
TOTAL	109	213	246	7

^a"Other" included private security services and informal neighborhood groups.

⁵Bias may have been introduced into the question of which law enforcement services were available since the list included only "highway patrol," "municipal police," "sheriff's department," and "other." Other types of law enforcement services which were available for limited purposes included the Federal Bureau of Investigation and the South Dakota Department of Criminal Investigation. Hence, which services were available hypothetically depended upon the sampled households' interpretations of "available."

Nearly all of the responding households stated that various county sheriffs' departments were available to them.⁶ Most of the responding households from both types of locations also indicated that the state Highway Patrol was available. The services of the state Highway Patrol were actually available to all state residents.⁷ Some of the respondents which did not indicate that this type of law enforcement service was available apparently had the impression that highway patrolmen's responsibilities were restricted to the state's highways and were not available for non-highway areas.

Nearly all of the responding municipal households had municipal police departments available for law enforcement assistance. Twelve open country households (ten of which were located in Grant County) replied that the services of various municipal police departments were available to them. Whether the jurisdictions of the respective municipal police departments actually included these households is not known.

The Accessibility of Law Enforcement Services

To determine the accessibility of law enforcement service to households, consideration of several aspects of the service operation is necessary. For instance, households could be queried as to whether law enforcement personnel patrolled near their residences "regularly,"⁸

⁶With the exception of one household, all "responding" households indicated the services of their respective county sheriffs' departments were available. Three sampled households did not respond to the question.

⁷Telephone conversation with South Dakota Department of Public Safety, Division of Highway Patrol, District 1, April 20, 1977.

⁸The interpretation of "regular" was left to the interviewee, but as a general rule, "regular" was apparently considered by the respondents to be at least once a week.

whether law enforcement personnel were available on call, the distance to the nearest law enforcement office, the extent of the area served by a law enforcement agency, the adequacy of personnel and equipment, and whether law enforcement assistance was discriminatory according to such things as income, race, or influence. The first three considerations were within the realm of this study since relatively objective responses were obtainable from households on these topics. Consideration of the area served by a law enforcement office would more appropriately be part of a survey of law enforcement suppliers. The questions on the adequacy of personnel and equipment and on discrimination were provided for to some degree and will be considered in the subsection on "The Adequacy of Law Enforcement Services."

Sampled households were asked whether law enforcement officers made "regular" patrols past their property, whether local law enforcement officers were available on call, and the distance to the nearest law enforcement office with responsibility for law enforcement in their area. As shown in Table IV-7, a greater percentage of the sampled municipal households indicated that there was a "regular" patrol past their property as compared to the sampled open country households. A much smaller percentage of the sampled municipal households in Haakon County were exposed to a "regular" patrol as compared to the sampled municipal households in either of the other two counties. In addition, a smaller share of the sampled open country households in Grant County indicated there were "regular" patrols in comparison to those sampled open country households in Haakon and Brookings Counties. Approximately one-half of all the sampled households indicated that they were exposed

TABLE IV-7. THE ACCESSIBILITY OF LAW ENFORCEMENT SERVICES — BY COUNTY AND LOCATION

County and Location	"Regular" Patrol Made Past Property, Percent Yes	Officers Available On Call, Percent Yes	Distance ^a to Nearest Law Enforcement Office With Responsibility in Area -- Percent Responding ^{b,c}				
			X≤5	5<X≤10	10<X≤20	20<X≤30	X>30
Haakon							
Municipal	37.5 ^d	87.5 ^d	75.0	0.0	0.0	25.0	0.0
Open Country	42.1 ^d	89.5 ^d	0.0	0.0	47.4	42.1	10.5
County	40.0	88.6	34.3	0.0	25.7	34.3	5.7
Grant							
Municipal	69.4 ^d	96.8 ^d	88.7	1.6	8.1	0.0	1.6
Open Country	22.9 ^d	100.0 ^d	0.0	8.3	66.7	25.0	0.0
Total	49.1	98.2	50.0	4.5	33.6	10.9	0.9
Brookings							
Municipal	67.6 ^d	91.2 ^d	79.4	11.8	8.8	0.0	0.0
Open Country	41.4 ^d	98.6 ^d	45.7	21.4	27.1	5.7	0.0
Total	50.0	95.2	56.7	18.3	21.2	3.8	0.0
3 County Total							
Municipal	64.3	93.8	83.9	4.5	7.1	3.6	0.8
Open Country	34.8	97.1	23.4	13.9	43.8	17.5	1.5
Total	48.0	95.6	50.6	9.6	27.3	11.2	1.2

^aFor municipal respondents, 12 blocks were considered to equal one mile.

^bPercents add across but may not sum to 100 percent due to rounding.

^cX equals the distance in miles.

^dThe percentage shown is the percent of the sampled households of the location (Mun., OC) within each county that responded "yes."

to what they considered to be a "regular" law enforcement patrol past their property. A large percentage of the sampled households (95.6 percent) responded that law enforcement officers were available on call although a lesser proportion of the Haakon County households indicated such availability as compared to the sampled households in the other two counties (see Table IV-7).

The distances of the various sampled households to the nearest law enforcement offices with responsibility for law enforcement in their respective areas are grouped into categories in Table IV-7. Casual inspection of the data reveals that the sampled municipal households were generally closer to a law enforcement office than were the sampled open country households. The large majority of municipal households (83.9 percent) were within five miles of a law enforcement office whereas the largest share of the sampled open country households (43.8 percent) were from 10 to 20 miles away from the nearest law enforcement office. Approximately 81 percent of the open country sampled households were within 20 miles of the nearest law enforcement office. Some municipalities did not have a municipal law enforcement agency. For these municipalities, the nearest law enforcement office was either a sheriff's office or a Highway Patrol office. This fact explains why several municipal households were relatively distant from a law enforcement facility. With respect to the open country samples in each county, it can be stated generally that the less densely populated the county, the further the open country households in that county were from a law enforcement office. It should be kept in mind, however, that this statement is based upon the data from only three counties.

Utilization of Law Enforcement Services

Various questions were asked of the sampled households which had requested law enforcement assistance in the last three years. These households were able to provide additional information on law enforcement services that was related to that on the "adequacy" of law enforcement services. Accordingly, 52 of the 250 sampled households reported that they had requested law enforcement assistance in the three years prior to the survey. Most of the municipal households called municipal police whereas most of the sampled open country households which had requested assistance called a county sheriff. For 43 of the households, it took less than five minutes to contact the law enforcement agency which they had called while for three households it took from 5 to 10 minutes.⁹

The reasons that the sampled households gave for having requested assistance are listed in Table IV-8. Some of those households which requested assistance listed more than one reason for their request. Thus, the reported number of reasons was greater than the number of households which requested assistance. One could perhaps obtain more accurate statistics as to the reasons assistance was requested if one were to investigate the records of the law enforcement agencies in the sampled counties.

In those cases in which law enforcement assistance was rendered,

⁹The time required to contact a law enforcement agency may also be considered to be a measure of the accessibility of law enforcement services. By this measure, it would appear as if law enforcement services were generally accessible.

TABLE IV-8. REASONS FOR REQUESTING LAW ENFORCEMENT ASSISTANCE BY SAMPLE AND SUBSAMPLES -- NUMBER OF HOUSEHOLDS RESPONDING

Reason	Haakon County			Grant County			Brookings County			3 County Total		
	Mun	OC	Total	Mun	OC	Total	Mun	OC	Total	Mun	OC	Total
Auto Accident	1	0	1	3	0	3	2	3	5	6	3	9
Illness or Other Accident	0	0	0	1	0	1	0	4	4	1	4	5
Traffic Violation	0	0	0	2	0	2	0	3	3	2	3	5
Burglary and/or Theft	0	0	0	6	1	7	1	3	4	7	4	11
Vandalism	1	0	1	0	2	2	1	1	2	2	3	5
Hunters/Firearm Violations	0	0	0	1	0	1	0	1	1	1	1	2
Prowlers/Trespassers	0	0	0	0	0	0	0	4	4	0	4	4
Disturbances or Fights	0	0	0	3	0	3	0	0	0	3	0	3
Stray Pets	0	0	0	5	0	5	2	0	2	7	0	7
Other	1	1	2	1	0	1	0	2	2	2	3	5
Not Indicated	0	1	1	0	0	0	0	0	0	0	1	1

households were asked to indicate the amount of time which had elapsed before actual assistance was rendered. In 31 of the 49 cases in which assistance was rendered, the response time was less than one-half hour. Nine calls for law enforcement assistance required from one-half hour to one hour. In three instances, 2 to 3 hours had elapsed while in two cases, 6 to 24 hours had elapsed before assistance was rendered. In the four remaining cases, a law enforcement officer had not responded until at least one day after the initial call for assistance. At first glance, it might appear as if law enforcement assistance was lax in some cases due to the relatively long period of time which had elapsed before actual assistance was available. However, before this judgement could be made, it would be necessary to know the reason for the call and whether immediate assistance was necessary in any specific case. This particular type of analysis was beyond the scope of this research.

Those households which had requested assistance were also queried as to whether they were satisfied with the assistance they received. Forty-three of the 51 households (84.3 percent) which responded to this question indicated their satisfaction with the law enforcement assistance they received. Conversely, eight households (15.7 percent) were not satisfied with the assistance rendered. Whether any particular household was satisfied or dissatisfied was not dependent entirely on whether a solution was found for the problem for which the call was made. Other factors respondents found important were the response time and the disposition of the assisting officer.

The Adequacy of Law Enforcement Services

The nature of the problems listed by the sampled households were of two types. One set of problems were law violations, the other set were service inadequacies.¹⁰ Approximately one-fourth of the responding households (59 of 248) revealed that they had encountered a law enforcement problem (see Table IV-9). A greater percentage of the responding municipal households (38 of 110, 34.5 percent) had had problems in comparison to the sampled open country households (21 of 138, 15.2 percent).

Two notable problems were traffic offenses and vandalism and/or theft. Eleven of 59 households which had experienced one or more problems (18.6 percent) indicated that traffic offenses was the type of law enforcement problem which they most wanted eliminated. Six households (five of which were open country households) were willing to pay additional amounts to attempt to eliminate the problem. Slightly more than 15 percent of those households with problems (9 of 59) revealed that vandalism and/or theft was the type of problem they most wanted to see eliminated. Five of these households were willing to pay more to correct the problem. No more than 2.4 percent of the responding households (6 of 248) were willing to pay extra to correct a specific law

¹⁰ Law enforcement was the only service for which a list of problems was not provided in the questionnaire. Hence, the two types of categories are utilized in Table IV-9. One might argue that law violations were partly due to service inadequacies and hence should not have been considered separately. However, respondents were not necessarily sure of the causes of the listed law violations and to press them to identify specific reasons (such as various service inadequacies) would have biased the sample results unnecessarily.

TABLE IV-9. THE ADEQUACY OF LAW ENFORCEMENT SERVICES — NUMBER OF HOUSEHOLDS RESPONDING, THREE COUNTY TOTAL

Problem	Number Having this Problem in Last Three Years		Number Listing This Problem as the One They Most Wanted Eliminated		Number Willing to Pay to Eliminate this Problem		Number Willing to Pay Specified Amounts to Eliminate this Problem						Are You Getting Your Money's Worth? — by Type of Problem Wanted Eliminated							
	MUN	OC	MUN	OC	MUN	OC	No Estimate		Under \$5		\$5 to \$10		Over \$10		Yes		No		Don't Know	
							MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC
VIOLATIONS OF THE LAW																				
Traffic Offenses	11	5	6	5	1	5	0	0	0	2	1	3	0	0	5	5	0	0	1	0
Vandalism and Theft	5	6	4	5	3	2	2	1	1	0	0	1	0	0	3	3	1	0	0	2
Drug Usage	4	1	3	1	0	0	0	0	0	0	0	0	0	0	3	1	0	0	0	0
Alcohol Usage	2	2	2	1	0	1	0	0	0	1	0	0	0	0	1	1	0	0	1	0
Bothersome Pets	3	0	3	0	2	0	0	0	2	0	0	0	0	0	3	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SERVICE INADEQUACIES																				
Unequal Enforcement	4	0	4	0	3	0	1	0	1	0	1	0	0	0	1	0	2	0	1	0
Lack of Personnel	2	0	1	0	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0
Problem Personnel	9	3	6	3	1	2	0	0	1	2	0	0	0	0	3	2	3	1	0	0
Law Enforcement Source too Distant	1	3	0	2	0	1	0	0	0	1	0	0	0	0	0	1	0	1	0	0
Inadequate Service	4	2	3	1	2	0	0	0	2	0	0	0	0	0	1	0	1	1	1	0
Lax Law Enforcement	3	1	2	0	2	0	1	0	1	0	0	0	0	0	0	0	1	0	1	0
Insufficient Salaries	2	0	2	0	2	0	0	0	1	0	1	0	0	0	2	0	0	0	0	0
Other	3	3	2	3	1	0	0	0	0	1	0	0	0	1	2	1	1	0	0	0
SUBTOTAL	<u>38</u>	<u>21</u>	<u>38</u>	<u>21</u>	<u>18</u>	<u>11</u>	<u>4</u>	<u>1</u>	<u>9</u>	<u>6</u>	<u>5</u>	<u>4</u>	<u>0</u>	<u>0</u>	<u>24</u>	<u>15</u>	<u>9</u>	<u>4</u>	<u>5</u>	<u>2</u>
None			72	117											66	98	2	5	4	14
TOTAL			110	138											90	113	11	9	9	16

No entry is made since this total would represent the number of problems reported and not the number of responding households.

enforcement problem, that problem having been traffic offenses.

No specific problem in the "service inadequacy" category was particularly noteworthy. However, if one were to consider those problems listed in both categories as the result of inadequate law enforcement funding and as an indication of social disorganization, then an important consideration is the number of households which indicated a willingness to pay. Willingness to pay, if actually paid, would help alleviate the inadequate funding problem but the problem of social disorganization is an issue of political and socioeconomic concern outside the scope of this research. Accordingly, 29 of the 248 responding households (11.7 percent) were willing to pay to correct various law enforcement problems, many of which were related to inadequate funding. That is, more funds would most likely aid in providing more personnel ("lack of personnel") and facilities ("law enforcement source too distant") and better trained and more professional personnel ("inadequate service," "unequal enforcement," "problem personnel," "lax law enforcement," and "insufficient salaries"). Of course, the grouping of these problems is arbitrary and the assumption that they were partly due to inadequate funding is a conjecture on the part of this author.

Twenty of the 248 responding households (8.1 percent) were of the opinion that they were not getting their money's worth from their expenditures on law enforcement services (see Table IV-9). Nearly 16 percent (8 of 51) of those households which had actually requested law enforcement assistance were dissatisfied with the assistance they received. Both percentages were rather sizable and perhaps indicated

that there was a need for improvement of law enforcement personnel and facilities. Law enforcement services in rural areas are typically labor intensive and therefore the judgments of households may be more subjective with respect to this particular service. In addition, law enforcement problems are generally more complex than are water or sewage disposal problems and are probably more difficult to correct.

Selected data from the subsamples were noteworthy. In Haakon County, no specific problem was of particular "importance." Ten of the 34 responding households (28.6 percent) had encountered a law enforcement problem of some kind and four households were willing to pay an extra amount (see Table IV-10). Four Haakon County sampled households, all of which were municipal, indicated that they were not getting their money's worth from law enforcement services.

Twenty-four of the 109 responding households (22.0 percent) in Grant County had encountered at least one law enforcement problem in the past three years (see Table IV-11). However, 21 of the 24 households were located in municipalities. Although traffic offenses and problem personnel were notable problems that households wanted to see eliminated, no problem was of special importance in the willingness to pay category. Only two households were willing to pay an extra monthly amount to correct a specific problem and only 12 of the 109 responding households (11.0 percent) in Grant County indicated a willingness to pay to correct various law enforcement problems. Seven sampled households in the county did not think that they were getting their money's worth.

Twenty-five of the 105 sampled households (23.8 percent) in

TABLE IV-10. THE ADEQUACY OF LAW ENFORCEMENT SERVICES — NUMBER OF HOUSEHOLDS RESPONDING, WAAKON COUNTY

Problem	Number Having this Problem in Last Three Years		Number Listing This Problem as the One They Most Wanted Eliminated		Number Willing to Pay to Eliminate this Problem		Number Willing to Pay Specified Amounts to Eliminate this Problem				Are You Getting Your Money's Worth? -- by Type of Problem Wanted Eliminated									
	MUN	OC	MUN	OC	MUN	OC	No Estimate		Under \$5		\$5 to \$10		Over \$10		Yes		No		Don't Know	
							MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC
VIOLATIONS OF THE LAW																				
Traffic Offenses	2	0	1	0	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0
Vandalism and Theft	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Drug Usage	3	0	2	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
Alcohol Usage	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Bothersome Pets	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SERVICE INADEQUACIES																				
Unequal Enforcement	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lack of Personnel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Problem Personnel	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0
Law Enforcement Source too Distant	1	1	0	1	0	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0
Inadequate Service	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lax Law Enforcement	1	0	1	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0
Insufficient Salaries	1	0	1	0	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0
Other	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
SUBTOTAL	<u>11</u>	<u>3</u>	<u>7</u>	<u>3</u>	<u>3</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>2</u>	<u>1</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>5</u>	<u>3</u>	<u>2</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
None			8	16										7	16	2	0	0	0	0
TOTAL			<u>15</u>	<u>19</u>										<u>12</u>	<u>19</u>	<u>4</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

^aNo entry is made since this total would represent the number of problems reported and not the number of responding households.

TABLE IV-11. THE ADEQUACY OF LAW ENFORCEMENT SERVICES — NUMBER OF HOUSEHOLDS RESPONDING, GRANT COUNTY

Problem	Number Having this Problem in Last Three Years		Number Listing This Problem as the One They Most Wanted Eliminated		Number Willing to Pay to Eliminate this Problem		Number Willing to Pay Specified Amounts to Eliminate this Problem				Are You Getting Your Money's Worth? — by Type of Problem Wanted Eliminated									
	MUN	OC	MUN	OC	MUN	OC	No Estimate		Under \$5		\$5 to \$10		Over \$10		Yes		No		Don't Know	
							MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC
VIOLATIONS OF THE LAW																				
Traffic Offenses	6	1	4	1	0	1	0	0	0	0	0	1	0	0	3	1	0	0	1	0
Vandalism and Theft	4	0	3	0	2	0	1	0	1	0	0	0	0	0	2	0	1	0	0	0
Drug Usage	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Alcohol Usage	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Bothersome Pets	2	0	2	0	1	0	0	0	1	0	0	0	0	0	2	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SERVICE INADEQUACIES																				
Unequal Enforcement	3	0	3	0	2	0	1	0	1	0	0	0	0	0	1	0	1	0	1	0
Lack of Personnel	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Problem Personnel	4	2	3	2	0	2	0	0	2	0	0	0	0	3	1	0	1	0	0	
Law Enforcement Source too Distant	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Inadequate Service	2	0	1	0	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	
Lax Law Enforcement	1	1	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0	
Insufficient Salaries	1	0	1	0	1	0	0	0	0	1	0	0	0	1	0	0	0	0	0	
Other	1	0	1	0	1	0	0	0	0	1	0	0	0	0	0	1	0	0	0	
SUBTOTAL	<u>21</u> ^a	<u>11</u> ^a	<u>21</u>	<u>13</u>	<u>9</u>	<u>3</u>	<u>3</u>	<u>4</u>	<u>2</u>	<u>2</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>14</u>	<u>2</u>	<u>3</u>	<u>1</u>	<u>4</u>	<u>0</u>	
None			40	45										37	33	0	3	2	9	
TOTAL			<u>61</u>	<u>48</u>										<u>51</u>	<u>35</u>	<u>3</u>	<u>4</u>	<u>6</u>	<u>9</u>	

^aNo entry is made since this total would represent the number of problems reported and not the number of responding households.

TABLE IV-12. THE ADEQUACY OF LAW ENFORCEMENT SERVICES — NUMBER OF HOUSEHOLDS RESPONDING, BROOKINGS COUNTY

Problem	Number Having this Problem in Last Three Years		Number Listing This Problem as the One They Most Wanted Eliminated		Number Willing to Pay to Eliminate this Problem		Number Willing to Pay Specified Amounts to Eliminate this Problem				Are You Getting Your Money's Worth? -- by Type of Problem Wanted Eliminated									
							No Estimate		Under \$5		\$5 to \$10		Over \$10		Yes		No		Don't Know	
	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC
VIOLATIONS OF THE LAW																				
Traffic Offenses	3	4	1	4	0	4	0	0	0	2	0	2	0	0	1	4	0	0	0	0
Vandalism and Theft	1	6	1	5	1	2	1	1	0	0	0	1	0	0	1	3	0	0	0	2
Drug Usage	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Alcohol Usage	0	2	0	1	0	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0
Bothersome Pets	1	0	1	0	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SERVICE INADEQUACIES																				
Unequal Enforcement	1	0	1	0	1	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0
Lack of Personnel	1	0	1	0	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0
Problem Personnel	3	0	2	0	1	0	0	0	1	0	0	0	0	0	0	2	0	0	0	0
Law Enforcement Source too Distant	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Inadequate Service	2	1	2	1	1	0	0	0	1	0	0	0	0	0	0	0	1	1	1	0
Lax Law Enforcement	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Insufficient Salaries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	2	2	1	2	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0
SUBTOTAL	<u>11</u> ^a	<u>11</u> ^a	<u>10</u>	<u>15</u>	<u>6</u>	<u>7</u>	<u>1</u>	<u>1</u>	<u>3</u>	<u>3</u>	<u>2</u>	<u>3</u>	<u>0</u>	<u>0</u>	<u>5</u>	<u>10</u>	<u>4</u>	<u>3</u>	<u>1</u>	<u>2</u>
None			24	56											22	49	0	2	2	5
TOTAL			<u>34</u>	<u>71</u>											<u>27</u>	<u>59</u>	<u>4</u>	<u>5</u>	<u>3</u>	<u>7</u>

^aNo entry is made since this total would represent the number of problems reported and not the number of responding households.

Brookings County specified that they had encountered one or more law enforcement service problems in the three years prior to the survey (see Table IV-12). Two problems were notable, both of which were "law violation" problems and both were of primary importance in the open country area of the Brookings County subsample. Six of the 25 households with problems indicated that vandalism and/or theft was the type of problem they most wanted to see eliminated although 5 of these 6 households were located in the open country. Three of the 13 sampled households willing to pay extra wanted to spend this additional amount on the vandalism and/or theft problem. Five households (four of which were open country) stated that traffic offenses was the type of problem they most wanted eliminated and all four open country households were willing to pay extra to correct this problem. Nine of the 105 sampled households (8.6 percent) thought that they were not getting their money's worth from their "current" expenditures on law enforcement services.

Summary

Several topics in addition to the adequacy of fire protection and law enforcement were discussed in this chapter. For fire protection these topics included principal sources, financing methods, utilization, and response times. All the municipal households indicated that various municipal fire departments were their principal sources. Open country households most frequently cited municipal-rural and municipal fire departments. Donations and fund raising, taxation, and special fees were the most frequently listed forms of financing. Ten percent of the

sampled households had requested assistance to extinguish a fire in the prior three years. Fire departments responded within 15 minutes in over 80 percent of the cases.

One-fifth of the responding households listed various fire protection service problems. Only 7.7 percent of all the households were willing to pay additional monthly amounts and 3.6 percent was the largest set of such households that were willing to pay extra to correct any particular problem. Thus, it appeared as if households were satisfied with the existing levels of fire protection.

Two notable fire protection problems were insufficient water supply and slow response. Nearly one-third of the households with problems indicated that the problem they most wanted eliminated was insufficient water supply. This amounted to only 17 households but just over 50 percent of these households were willing to pay extra. Slow response was primarily a problem in open country areas. Of the households with problems, 36.5 percent indicated they wanted this problem eliminated but only 21.1 percent of them were willing to pay.

Available types, accessibility, and utilization were discussed in reference to law enforcement. Most sampled households indicated that various county sheriffs' departments and the state Highway Patrol were available. Nearly all of the responding municipal households and a few open country households stated they could obtain assistance from municipal police departments.

With respect to accessibility, sampled municipal households were more likely to have experienced "regular" patrols than were open

country households. Municipal households were generally nearer to a law enforcement office than were open country households. Over 95 percent of all the households responded that law enforcement personnel were available on call.

Slightly more than 20 percent of the sampled households had requested assistance in the last three years. Less than five minutes was generally required to contact an officer in most instances. In 40 of the 49 calls, assistance was rendered in less than one hour. In four instances, however, response time was more than 24 hours. Nearly 16 percent of those sampled households that requested assistance were dissatisfied with the assistance they received.

Approximately one-fourth of the responding households revealed that they had encountered law enforcement service problems. Almost 12 percent of all the households were willing to pay and just over 8 percent thought that they were not getting their money's worth. Also, no more than 2.4 percent of all the households were willing to pay an additional amount to correct a specific problem -- traffic offenses. As with fire protection, sampled households generally considered law enforcement services to be adequate although a rather sizable number thought that they were not getting their money's worth from expenditures on this service.

CHAPTER V

EDUCATIONAL AND HEALTH CARE SERVICES

Selected aspects of the sampled households' statements and opinions on educational and health care services are covered in this chapter. Discussion of the two services is combined in the chapter more for convenience than because of similarities between the two services. Even so, similarities are apparent. For instance, the personnel directly involved in providing the two services are typically required to have more formal training than the personnel involved in the provision of the five services previously discussed. In addition, judgments of respondents about the adequacy of educational or health care services require consideration of both labor and capital inputs since both are important components in the provision of these services. When labor accounts for a large share of the factor inputs employed in supplying a service, the measurement of the quantity of output becomes more difficult because of the complexities involved in measuring quality. Hence, judgments concerning the adequacy of either of these services are likely to be influenced by households' expectations of the quality aspect as well as the quantity aspect of output.¹

Formal Educational Services

All levels of public and private educational services were

¹For those researchers conducting demand analyses, another important aspect with respect to the services is the presence of important private costs associated with the consumption of either

were considered including nursery school, elementary and secondary education, higher education, adult vocational education, vocational/technical school, and special education. Those aspects of formal education with which the questionnaire dealt were school participation, households' private costs, and the households' views on the adequacy of educational services.

Enrollment of Household Members in Formal Education

Approximately 44 percent of the responding households (109 of 248) reported that at least one household member was enrolled in one of the levels of formal education. Over one-half of the responding open country households (70 of 137) had at least one member enrolled in formal schooling whereas only 35.1 percent of the responding municipal households (39 of 111) reported school enrollment by at least one household member. These figures were fairly consistent for each location in each county.

The number of responding households which had students enrolled at various educational levels as well as the total number of household members enrolled at each level of education are shown in Table V-1. The number of students and the number of households columns are separately summed to arrive at the figures shown in the "Totals" column. The last two entries in the "Totals" column reveal that the 109 responding household which had 225 household members enrolled in the various levels of education yielded an average enrollment of 2.06 students per responding household.

service. "Associated private costs" may be the only proxies of price and demand available to those analyzing the demand for the services.

TABLE V-1. NUMBER OF STUDENTS AND NUMBER OF SAMPLED HOUSEHOLDS REPORTING HOUSEHOLD MEMBERS ENROLLED IN DIFFERENT LEVELS OF FORMAL EDUCATION — BY SAMPLE AND SUBSAMPLES

County and Location	Nursery and Kindergarten		Elementary (Grades 1-6)		Secondary (Grades 7-9)		Secondary (Grades 10-12)		Vocational and/or Technical School		College		Special Education		Totals		Average Enrollment ^a	
	Stu- dents	House- holds	Stu- dents	House- holds	Stu- dents	House- holds	Stu- dents	House- holds	Stu- dents	House- holds	Stu- dents	House- holds	Stu- dents	House- holds	Stu- dents	House- holds		
Eakon																		
Municipal	2	2	3	3	1	1	4	3	0	0	1	1	0	0	11	6	1.33	
Open Country	2	2	10	6	2	2	1	1	0	0	1	1	0	0	16	7	2.29	
Total	4	4	13	9	3	3	5	4	0	0	2	2	0	0	27	13	2.08	
Grant																		
Municipal	1	1	20	10	7	4	11	10	0	0	4	3	3	2	46	22	2.09	
Open Country	2	2	26	16	7	7	22	13	1	1	0	0	0	0	58	26	2.23	
Total	3	3	46	26	14	11	33	23	1	1	4	3	3	2	104	48	2.17	
Brookings																		
Municipal	1	1	7	4	6	4	1	1	0	0	1	1	1	1	17	11	1.55	
Open Country	3	3	28	20	13	13	21	16	0	0	10	9	2	1	77	37	2.08	
Total	4	4	35	24	19	17	22	17	0	0	11	10	3	2	94	48	1.96	
3 County Total																		
Municipal	4	4	30	17	14	9	16	14	0	0	6	5	4	3	74	39	1.90	
Open Country	7	7	64	42	22	22	44	30	1	1	11	10	2	1	151	70	2.16	
Total	11	11	94	59	36	31	60	44	1	1	17	15	6	4	225	109	2.06	

^aThe average enrollment data shown apply to sampled households with household members enrolled in formal education at the time of the interviewing.

Any explanations for the differences in average enrollments between municipal and open country areas or between counties would be tenuous without inclusion of enrollment data from the City of Brookings in Brookings County. Analysis of the socioeconomic influences on these differences is beyond the scope of this thesis.

Private Costs for Educational Services

Most households provide financial support for formal education through the payment of taxes. Public primary and secondary education in South Dakota is financed principally by general revenue taxation although other revenues are obtained from state and federal programs. State supported higher education institutions are financed by a combination of state and federal funds and private financing. The private financing comes from such items as tuition and fees, scholarship funds, and grants. Private educational institutions receive financing from tuition and fees, donations, and grants as well as from a variety of other sources.

In order to determine the private costs which sampled households had incurred for formal education, households with members enrolled in school were asked to approximate their annual private educational expenses. These private costs included transportation costs for classroom instruction and/or extracurricular activities, tuition and fees, food and lodging costs, and expenditures for books, supplies, special equipment and individual instruction. The costs of transportation that arose from the use of a private vehicle were estimated by calculating each responding household's miles per trip, trips per week, and weeks

per year of student transportation. In those instances in which two or more students traveled together to the same destination, the household's total travel was allocated equally between the students to avoid double counting. The estimated total mileage was then multiplied by an arbitrary figure of \$0.16 (per mile) to arrive at an estimated dollar cost. These calculations were done separately for travel for classroom instruction and travel for extracurricular activities. All other costs were recorded according to households' estimates of those costs. These cost figures were then totaled for each household having members enrolled in school. The number of responding households which had annual private costs within various dollar ranges are shown in Table V-2.

From the data in Table V-2, one discovers that a majority of responding households with at least one member enrolled in formal education spent less than \$300.00 annually on private education costs. However, comparison of the municipal and open country data reveals that a majority of the open country households spent more than \$300.00 annually. This finding would appear to indicate that, on the basis of the sample data, open country households had generally spent more annually for the specified costs than had municipal households. Many of those households which had spent relatively large annual sums on the specified private costs were located in the open country area of Brookings County. Some of these households had members enrolled at South Dakota State University in Brookings (City) which helps to explain why many open country households had relatively large annual expenditures.

TABLE V-2. ESTIMATED TOTAL PRIVATE COSTS FOR EDUCATION BY SAMPLE AND SUBSAMPLES — NUMBER OF HOUSEHOLDS REPORTING^a

County and Location	x ^b =0	0<x≤100	100<x≤200	200<x≤300	300<x≤400	400<x≤500	500<x≤1,000	x>1000	Total
Haakon									
Municipal	0	4	2	0	0	0	0	0	6
Open Country	1	1	1	0	0	1	1	2	7
Total	1	5	3	0	0	1	1	2	13
Grant									
Municipal	0	3	7	3	2	4	0	3	22
Open Country	3	5	4	7	1	1	4	1	26
Total	3	8	11	10	3	5	4	4	48
Brookings									
Municipal	4	1	4	1	0	0	1	0	11
Open Country	0	4	2	6	8	2	6	9	37
Total	4	5	6	7	8	2	7	9	48
3 County Total									
Municipal	4	8	13	4	2	4	1	3	39
Open Country	4	10	7	13	9	4	11	12	70
Total	8	18	20	17	11	8	12	15	109

^aThe numbers shown represent only those households which had one or more family members enrolled in formal education.

^bx represents the estimated annual private household costs in dollars.

The average annual expenditure per student and per household for those households with members enrolled in various educational institutions can be calculated by use of the sample data in the "Totals" column of Table V-1 and the estimated total private costs. These averages are shown in Table V-3. The reader should recall that these average costs were based only on the costs specified in the questionnaire

TABLE V-3. ESTIMATED ANNUAL PRIVATE COSTS FOR EDUCATION PER STUDENT AND PER HOUSEHOLD WITH MEMBERS ENROLLED — BY SAMPLE AND SUBSAMPLES

County and Location	Private Costs	
	Per Student	Per Household with Members Enrolled
Haakon		
Municipal	\$ 58.87	\$107.93
Open Country	262.13	599.14
Total	179.32	372.43
Grant		
Municipal	433.05 ^a	905.46 ^a
Open Country	137.50	306.73
Total	268.22	581.15
Brookings		
Municipal	113.10	174.78
Open Country	379.91	790.62
Total	331.65	649.49
3 County Total		
Municipal	303.92	576.68
Open Country	274.32	991.74
Total	284.05	586.35

^aOne responding household estimated annual total costs of nearly \$10,000.00 which accounts for the large averages shown.

and did not include whatever costs the sampled households had paid through the public sector. The average costs per student and per

household varied among counties and locations within counties principally because of differences in the "quantities" of education which the sampled households purchased. Perhaps the most revealing data are those which pertained to the total sample average costs per student and per household. Average costs per student were similar for the responding households of both municipal and open country locations, averaging approximately \$284 annually. The average costs per household were greater for the open country households because the responding open country households had more household members enrolled on average. In summary, 109 sampled households had 225 household members enrolled in formal education at an average annual private cost of \$284.05 per student and \$586.35 per household.

The Adequacy of Educational Services

The analysis of the adequacy of educational services is more difficult than that for previous services because many of the "problems" listed by the sampled households were complete opposites (see Table V-4). For instance, 32 sampled households indicated that the high costs (high taxes) associated with education was the problem they most wanted to see eliminated whereas 15 households indicated that the opposite problem, inadequate funding, was the problem they most wanted eliminated. Furthermore, seven sampled households wanted the problem that schools were too small eliminated whereas four sampled households most wanted the problem eliminated of schools being too large. A similar dilemma is evident in the comparison of the problems of too much program diversification and extracurricular activities and need to concentrate

TABLE V-4. THE ADEQUACY OF EDUCATIONAL SERVICES -- NUMBER OF HOUSEHOLDS RESPONDING, THREE COUNTY TOTAL

Problem	Number Having this Problem in Last Three Years		Number Listing This Problem as the One They Most Wanted Eliminated		Number Willing to Pay to Eliminate this Problem		Number Willing to Pay Specified Amounts to Eliminate this Problem						Are You Getting Your Money's Worth? -- by Type of Problem Wanted Eliminated							
							No Estimate		Under \$5		\$5 to \$10		Over \$10		Yes		No		Don't Know	
	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC
FUNDING PROBLEMS																				
High Costs	11	36	6	26	0	0	0	0	0	0	0	0	0	0	4	17	2	4	0	5
Inadequate Funding	8	8	8	7	7	5	0	3	2	0	5	1	0	1	7	5	1	0	0	2
Inefficient Use of Funding	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	1	1	0	0	0
Strings Attached to Government Support	3	0	3	0	1	0	0	0	1	0	0	0	0	0	2	0	1	0	0	0
Teachers' Salaries are too Low	3	1	2	0	2	0	1	0	1	0	0	0	0	0	2	0	0	0	0	0
High Tuition in College	5	1	4	1	3	0	1	0	2	0	0	0	0	0	3	1	0	0	1	0
TEACHERS PROBLEMS																				
Lack of Teacher Training or Commitment	4	10	4	9	1	2	0	1	1	1	0	0	0	0	3	7	1	2	0	0
Lack of Discipline	13	10	11	7	3	0	0	0	1	0	2	0	0	0	7	6	2	0	2	1
CURRICULUM PROBLEMS																				
Need to Concentrate More on the Three R's	5	6	1	4	0	2	0	1	0	1	0	0	0	0	0	3	0	1	1	0
Too Much Program Diversification and Extracurricular Activities	7	6	4	4	0	1	0	1	0	0	0	0	0	0	2	2	2	1	0	1
Lack of Special Courses	11	16	7	10	4	10	0	2	1	2	1	4	2	2	5	9	2	0	0	1
Schools Teach the Wrong Things	14	19	7	10	3	4	1	2	2	1	0	0	0	1	4	4	1	5	2	1
ORGANIZATIONAL PROBLEMS																				
Schools are Too Small	8	5	4	3	2	2	1	0	0	1	0	1	1	0	4	3	0	0	0	0
Schools are Too Big	1	8	0	4	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	1
Organization of Physical Facilities	1	8	1	5	0	3	0	2	0	0	0	1	0	0	0	3	1	2	0	0
Lack of Communication with Community	1	4	1	3	0	2	0	1	0	0	0	1	0	0	1	3	0	0	0	0
Inadequate Instructional Equipment	6	4	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Other	3	9	3	6	0	3	0	0	0	1	0	1	0	1	1	6	0	0	2	0
SUBTOTAL	<u>111</u> ^a	<u>137</u> ^a	<u>68</u>	<u>100</u>	<u>27</u>	<u>34</u>	<u>5</u>	<u>13</u>	<u>11</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>3</u>	<u>5</u>	<u>46</u>	<u>72</u>	<u>14</u>	<u>16</u>	<u>8</u>	<u>12</u>
None			43	37											40	29	0	4	3	4
TOTAL			<u>111</u>	<u>137</u>											<u>86</u>	<u>101</u>	<u>14</u>	<u>20</u>	<u>11</u>	<u>16</u>

^aNo entry is made since this total would represent the number of problems reported and not the number of responding households.

more on the "3R's" with the problems of lack of special courses and inadequate instructional equipment. The matter is complicated further by the likelihood that any effort to correct a specified problem may result in greater dissatisfaction among those who hold an opposing view. One may argue that this type of dissatisfaction may occur in any situation in which a decision is made. However, with this service the number of households that would likely be dissatisfied was of considerable size, especially in the case of high costs as opposed to inadequate funding. The conclusion one may draw from the sample data shown in Tables V-4, V-5, V-6, and V-7 is that, while a large majority (168 of 248, 67.7 percent) of the sampled households wanted changes in educational services, substantial numbers of sampled households expressed divergent views as to what changes they wanted.

Some of the divergence of sampled opinions was recorded from different counties or in different areas within counties. That is, some of those who thought that schools were too large were from one area while some which responded that schools were too small were from a different area so that the opposing views did not pose a dilemma. However, this situation was not always evident.

The problems are categorized under the various general headings shown in Tables V-4, V-5, V-6, and V-7 because of the difficulties discussed just above. As mentioned previously, 67.7 percent of the responding households (168 of 248) indicated various problems that they wanted eliminated. Sixty-one of the 168 households with problems (36.3 percent) were willing to pay additional amounts to see that the problems were eliminated. In addition, nearly 14 percent of the

TABLE V-5. THE ADEQUACY OF EDUCATIONAL SERVICES -- NUMBER OF HOUSEHOLDS RESPONDING, HAARON COUNTY

Problem	Number Having this Problem in Last Three Years		Number Listing This Problem as the One They Most Wanted Eliminated		Number Willing to Pay to Eliminate this Problem		Number Willing to Pay Specified Amounts to Eliminate this Problem				Are You Getting Your Money's Worth? -- by Type of Problem Wanted Eliminated										
	MUN	OC	MUN	OC	MUN	OC	No Estimate		Under \$5		\$5 to \$10		Over \$10		Yes		No		Don't Know		
							MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN
FUNDING PROBLEMS																					
High Costs	2	4	2	3	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	1
Inadequate Funding	1	0	1	0	1	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0
Inefficient Use of Funding	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Strings Attached to Government Support	1	0	1	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0
Teachers' Salaries are too Low	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
High Tuition in College	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TEACHERS PROBLEMS																					
Lack of Teacher Training or Commitment	0	2	0	2	0	1	0	1	0	0	0	0	0	0	0	0	1	0	1	0	0
Lack of Discipline	2	1	2	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
CURRICULUM PROBLEMS																					
Need to Concentrate More on the Three R's	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Too Much Program Diversification and Extracurricular Activities	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Lack of Special Courses	4	1	2	0	1	0	0	0	0	0	0	0	1	0	1	0	1	0	0	0	0
Schools Teach the Wrong Things	2	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
ORGANIZATIONAL PROBLEMS																					
Schools are Too Small	2	1	2	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0
Schools are Too Big	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Organization of Physical Facilities	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0
Lack of Communication with Community	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Inadequate Instructional Equipment	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	4	0	3	0	1	0	0	0	0	0	0	0	1	0	3	0	0	0	0	0
SUBTOTAL	<u>11</u>	<u>14</u>	<u>10</u>	<u>12</u>	<u>4</u>	<u>3</u>	<u>0</u>	<u>2</u>	<u>1</u>	<u>0</u>	<u>1</u>	<u>0</u>	<u>2</u>	<u>1</u>	<u>7</u>	<u>7</u>	<u>2</u>	<u>3</u>	<u>1</u>	<u>2</u>	<u>2</u>
None			6	6											6	5	0	2	0	0	0
TOTAL			<u>16</u>	<u>18</u>											<u>13</u>	<u>12</u>	<u>2</u>	<u>5</u>	<u>1</u>	<u>2</u>	<u>2</u>

^aNo entry is made since this total would represent the number of problems reported and not the number of responding households.

TABLE V-6. THE ADEQUACY OF EDUCATIONAL SERVICES -- NUMBER OF HOUSEHOLDS RESPONDING, GRANT COUNTY

Problem	Number Having this Problem in Last Three Years		Number Listing This Problem as the One They Most Wanted Eliminated		Number Willing to Pay to Eliminate this Problem		Number Willing to Pay Specified Amounts to Eliminate this Problem				Are You Getting Your Money's Worth? -- by Type of Problem Wanted Eliminated											
							No Estimate		Under \$5		\$5 to \$10		Over \$10		Yes		No		Don't Know			
	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC		
FUNDING PROBLEMS																						
High Costs	4	13	2	10	0	0	0	0	0	0	0	0	0	0	0	0	1	5	1	2	0	3
Inadequate Funding	5	7	5	6	4	4	0	2	2	0	2	1	0	1	4	4	4	4	1	0	0	2
Inefficient Use of Funding	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Strings Attached to Government Support	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0
Teachers' Salaries are too Low	2	1	2	0	2	0	1	0	1	0	0	0	0	0	2	0	0	0	0	0	0	0
Hgh. Tuition in College	4	1	3	1	3	0	1	0	2	0	0	0	0	0	2	1	0	0	0	1	0	
TEACHERS PROBLEMS																						
Lack of Teacher Training or Commitment	3	2	3	1	1	0	0	0	1	0	0	0	0	0	3	1	0	0	0	0	0	0
Lack of Discipline	7	3	6	2	1	0	0	0	0	0	1	0	0	0	4	2	1	0	1	0	1	0
CURRICULUM PROBLEMS																						
Need to Concentrate More on the Three R's	4	4	0	2	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
Too Much Program Diversification and Extracurricular Activities	5	3	2	2	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	1	0	1
Lack of Special Courses	5	6	3	4	1	4	0	0	1	1	0	3	0	0	3	3	0	0	0	0	1	0
Schools Teach the Wrong Things	11	7	7	4	3	1	1	1	2	0	0	0	0	0	4	2	1	2	2	2	0	0
ORGANIZATIONAL PROBLEMS																						
Schools are Too Small	3	3	1	2	0	2	0	0	0	1	0	1	0	0	1	2	0	0	0	0	0	0
Schools are Too Big	1	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Organization of Physical Facilities	1	2	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0
Lack of Communication with Community	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0
Inadequate Instructional Equipment	2	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Other	3	1	3	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2	0	0
SUBTOTAL	<u>3</u>	<u>1</u>	<u>43</u>	<u>37</u>	<u>16</u>	<u>11</u>	<u>4</u>	<u>3</u>	<u>9</u>	<u>2</u>	<u>3</u>	<u>5</u>	<u>0</u>	<u>1</u>	<u>29</u>	<u>24</u>	<u>8</u>	<u>6</u>	<u>6</u>	<u>7</u>	<u>7</u>	<u>7</u>
None			18	11											17	5	0	1	1	4		
TOTAL			<u>61</u>	<u>48</u>											<u>46</u>	<u>29</u>	<u>8</u>	<u>7</u>	<u>7</u>	<u>11</u>		

^aNo entry is made since this total would represent the number of problems reported and not the number of responding households.

TABLE V-7. THE ADEQUACY OF EDUCATIONAL SERVICES — NUMBER OF HOUSEHOLDS RESPONDING, BROOKINGS COUNTY

Problem	Number Having this Problem in Last Three Years		Number Listing This Problem as the One They Most Wanted Eliminated		Number Willing to Pay to Eliminate this Problem		Number Willing to Pay Specified Amounts to Eliminate this Problem						Are You Getting Your Money's Worth? — by Type of Problem Wanted Eliminated								
							No Estimate		Under \$5		\$5 to \$10		Over \$10		Yes		No		Don't Know		
	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	
FUNDING PROBLEMS																					
High Costs	5	19	2	13	0	0	0	0	0	0	0	0	0	0	0	2	11	0	1	0	1
Inadequate Funding	2	1	2	1	2	1	0	1	0	0	2	0	0	0	0	2	1	0	0	0	0
Inefficient Use of Funding	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Strings Attached to Government Support	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Teachers' Salaries are too Low	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
High Tuition in College	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
TEACHERS PROBLEMS																					
Lack of Teacher Training or Commitment	1	6	1	6	0	1	0	0	0	1	0	0	0	0	0	0	5	1	1	0	0
Lack of Discipline	4	6	3	4	2	0	0	0	1	0	1	0	0	0	0	2	4	1	0	0	0
CURRICULUM PROBLEMS																					
Need to Concentrate More on the Three R's	1	2	1	2	0	2	0	1	0	1	0	0	0	0	0	0	1	0	1	1	0
Too Much Program Diversification and Extracurricular Activities	2	2	2	1	0	1	0	1	0	0	0	0	0	0	0	1	1	1	0	0	0
Lack of Special Courses	2	9	2	6	2	6	0	2	0	1	1	1	1	2	1	6	1	0	0	0	0
Schools Teach the Wrong Things	1	9	0	5	0	3	0	1	0	1	0	0	0	1	0	1	0	3	0	1	1
ORGANIZATIONAL PROBLEMS																					
Schools are Too Small	3	1	1	1	1	0	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0
Schools are Too Big	0	6	0	3	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1
Organization of Physical Facilities	0	5	0	3	0	2	0	1	0	0	0	1	0	0	0	2	0	1	0	0	0
Lack of Communication with Community	0	3	0	2	0	2	0	1	0	0	0	1	0	0	0	2	0	0	0	0	0
Inadequate Instructional Equipment	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	4	0	3	0	2	0	0	0	1	0	1	0	0	0	3	0	0	0	0	0
SUBTOTAL	<u>15</u>	<u>41</u>	<u>15</u>	<u>51</u>	<u>7</u>	<u>20</u>	<u>1</u>	<u>8</u>	<u>1</u>	<u>5</u>	<u>4</u>	<u>4</u>	<u>1</u>	<u>3</u>	<u>10</u>	<u>41</u>	<u>4</u>	<u>7</u>	<u>1</u>	<u>3</u>	<u>3</u>
None			19	20											17	19	0	1	2	0	0
TOTAL			<u>34</u>	<u>71</u>											<u>27</u>	<u>60</u>	<u>4</u>	<u>8</u>	<u>3</u>	<u>3</u>	<u>3</u>

*No entry is made since this total would represent the number of problems reported and not the number of responding households.

responding households (34 of 248) indicated that they did not think that they were getting their money's worth. Most of those households which listed problems which may be arbitrarily categorized as being related to "too much educational services"² were unwilling to pay extra to eliminate those problems, as one might suspect. Conversely, of the 88 households which indicated they most wanted to eliminate problems which can be classified as problems where "something was lacking,"³ 46 were willing to pay additionally to correct those problems. Admittedly, some of the problems in both of the arbitrarily drawn categories may have been policy and/or attitudinal problems rather than funding problems.⁴ Thus, additional expenditures may not eliminate these problems. Since some households indicated a willingness to pay to have these problems eliminated, their responses were recorded nevertheless.

Notable problems relative to the total sample were high costs (high taxes), inadequate funding, and all of those problems listed under the general headings of teacher problems and curriculum problems in

²This type of category includes such problems as high costs, need to concentrate more on the "3R's" (which indicated too much concentration on other subjects), too much program diversification and other extracurricular activities, and schools too big.

³These problems include(d) inadequate funding, teachers' salaries too low, lack of teacher training or commitment, lack of discipline, lack of special courses, schools too small, organization for physical facilities (lack of), lack of communication with community, and inadequate instructional equipment.

⁴One may consider such problems as "lack of ... teacher commitment," "lack of discipline," and "lack of communication with community" as being related to problems of policy and attitude.

in Table V-4. Difficulties arise in attempting to delineate the general direction which the sampled households desired educational services to tend towards since the attempted solution of any one problem for some households would likely intensify the seriousness of an opposing problem for other households. Perhaps the only conclusive statement which can be made relative to the data in this section is that many sampled households "had" educational problems and many were willing to pay to correct these problems but there was general disagreement as to which problems should be eliminated. Similar reasoning applies to the sample data obtained from each county since the same dilemmas existed between problems.

One further comment is worthy of mention. Twenty-six of the 32 sampled households listed in Table V-4 which cited high costs (high taxes) as the problem they most wanted eliminated were located in open country areas. It is possible that these households were not so much dissatisfied with "current" educational expenditures as they were with the property tax used to finance the large share of local educational expenditures. Many open country dwellers (particularly farmers and ranchers) in South Dakota have contended that this tax has imposed an undue share of the burden of educational costs on themselves. Hence, the possibility exists that the 26 open country households which listed the high costs (high taxes) problem as that which they most wanted eliminated were not dissatisfied with the level of expenditures on education but with the method used to distribute educational costs.

Health Care Services

Besides consideration of the adequacy of health care services, other important health care considerations include the distances which people must travel in order to secure health care services, which services are used by the greatest number of households, and households' associated private costs for health care. Thus, in addition to questions on the adequacy of health care services, sampled households were requested to specify the distances to the nearest selected health care services, whether they had used these services in the last year, and the nonmedical costs they had incurred in obtaining these services. The next few sections are devoted to discussion of these topics.

Distance to the Nearest Selected Health Care Services

As one might suspect, the sampled municipal households were generally nearer to the selected health services than were the sampled open country households (see Tables V-8, V-9, V-10, and V-11). As an example, consider "General Practitioner" in Table V-8. Nearly 60 percent of the sampled municipal households (67 of 112) resided within one mile of general practitioners' services. None of the sampled open country households resided within one mile of a general practitioner. Also, 75.9 percent of the sampled municipal households (85 of 112) were located no farther than ten miles from general practitioners' services whereas only 44.9 percent of the sampled open country households were within this distance of general practitioners' services. Similar comparisons were found in relation to the other health care personnel and facilities. Moreover, similar conclusions can be drawn

TABLE V-8. DISTANCE TO THE NEAREST SELECTED HEALTH CARE PERSONNEL OR FACILITIES — NUMBER OF HOUSEHOLDS RESPONDING, THREE COUNTY TOTAL

Type of Health Care Personnel or Facility	Distance (In Miles) ^a														
	Less Than 1 Mile			1 to 10 Miles			11 to 100 Miles			Over 100 Miles			Totals		
	Mun	OC	Total	Mun	OC	Total	Mun	OC	Total	Mun	OC	Total	Mun	OC	Total
General Practitioner	67	0	67	18	62	80	27	76	103	0	0	0	112	138	250
Specialist (Of Any Kind)	18	12	30	6	34	40	80	75	155	8	17	25	112	138	250
Chiropractor	53	1	54	23	58	81	36	77	113	0	2	2	112	138	250
Osteopath	9	13	22	9	6	15	94	111	205	0	8	8	112	138	250
Registered Nurse	60	7	67	28	67	95	24	64	88	0	0	0	112	138	250
Practical Nurse	61	7	68	31	63	94	20	68	88	0	0	0	112	138	250
Public Health Nurse	50	10	60	29	54	83	33	74	107	0	0	0	112	138	250
Dentist	60	0	60	33	75	108	19	63	82	0	0	0	112	138	250
Optometrist	43	0	43	29	49	78	39	85	124	1	4	5	112	138	250
Mental Health Consultant	4	2	6	19	44	63	86	87	173	3	5	8	112	138	250
Hospital	39	0	39	46	50	96	27	88	115	0	0	0	112	138	250
Ambulance Service	62	1	63	35	74	109	15	63	78	0	0	0	112	138	250

^aThe columns show discrete groupings rather than continuous groupings since households' responses were rounded to the nearest mile unless the distance was less than one mile.

TABLE V-9. DISTANCE TO THE NEAREST SELECTED HEALTH CARE PERSONNEL OR FACILITIES — NUMBER OF HOUSEHOLDS RESPONDING, HAAKON COUNTY

Type of Health Care Personnel or Facility	Distance (In Miles) ^a												Totals		
	Less Than 1 Mile			1 to 10 Miles			11 to 100 Miles			Over 100 Miles			Mun	OC	Total
	Mun	OC	Total	Mun	OC	Total	Mun	OC	Total	Mun	OC	Total	Mun	OC	Total
General Practitioner	11	0	11	1	0	1	4	19	23	0	0	0	16	19	35
Specialist (Of Any Kind)	2	0	2	0	0	0	13	11	24	1	8	9	16	19	35
Chiropractor	0	1	1	0	0	0	16	16	32	0	2	2	16	19	35
Osteopath	3	3	6	0	0	0	13	8	21	0	8	8	16	19	35
Registered Nurse	12	4	16	1	4	5	3	11	14	0	0	0	16	19	35
Practical Nurse	12	3	15	1	3	4	3	13	16	0	0	0	16	19	35
Public Health Nurse	4	8	12	1	0	1	11	11	22	0	0	0	16	19	35
Dentist	12	0	12	4	19	23	0	0	0	0	0	0	16	19	35
Optometrist	0	0	0	0	0	0	16	15	31	0	4	4	16	19	35
Mental Health Consultant	2	1	3	0	0	0	12	13	25	2	5	7	16	19	35
Hospital	11	0	11	1	0	1	4	19	23	0	0	0	16	19	35
Ambulance Service	11	0	11	1	0	1	4	19	23	0	0	0	16	19	35

^aThe columns show discrete groupings rather than continuous groupings since households' responses were rounded to the nearest mile unless the distance was less than one mile.

TABLE V-10. DISTANCE TO THE NEAREST SELECTED HEALTH CARE PERSONNEL OR FACILITIES — NUMBER OF HOUSEHOLDS RESPONDING, GRANT COUNTY

Type of Health Care Personnel or Facility	Distance (In Miles) ^a														
	Less Than 1 Mile			1 to 10 Miles			11 to 100 Miles			Over 100 Miles			Totals		
	Mun	OC	Total	Mun	OC	Total	Mun	OC	Total	Mun	OC	Total	Mun	OC	Total
General Practitioner	44	0	44	11	3	14	7	45	52	0	0	0	62	48	110
Specialist (Of Any Kind)	4	0	4	1	0	1	51	40	91	6	8	14	62	48	110
Chiropractor	43	0	43	11	3	14	8	45	53	0	0	0	62	48	110
Osteopath	5	1	6	9	2	11	48	45	93	0	0	0	62	48	110
Registered Nurse	41	1	42	14	8	22	7	39	46	0	0	0	62	48	110
Practical Nurse	37	1	38	18	7	25	7	40	47	0	0	0	62	48	110
Public Health Nurse	45	2	47	11	4	15	6	42	48	0	0	0	62	48	110
Dentist	44	0	44	11	3	14	7	45	52	0	0	0	62	48	110
Optometrist	43	0	43	12	3	15	7	45	52	0	0	0	62	48	110
Mental Health Consultant	1	0	1	2	0	2	59	48	107	0	0	0	62	48	110
Hospital	28	0	28	27	3	30	7	45	52	0	0	0	62	48	110
Ambulance Service	32	0	32	23	13	36	7	35	42	0	0	0	62	48	110

^aThe columns show discrete groupings rather than continuous groupings since households' responses were rounded to the nearest mile unless the distance was less than one mile.

TABLE V-11. DISTANCE TO THE NEAREST SELECTED HEALTH CARE PERSONNEL OR FACILITIES — NUMBER OF HOUSEHOLDS RESPONDING, BROOKINGS COUNTY

Type of Health Care Personnel or Facility	Distance (In Miles) ^a												Totals		
	Less Than 1 Mile			1 to 10 Miles			11 to 100 Miles			Over 100 Miles			Mun	OC	Total
	Mun	OC	Total	Mun	OC	Total	Mun	OC	Total	Mun	OC	Total	Mun	OC	Total
General Practitioner	12	0	12	6	59	65	16	12	28	0	0	0	34	71	105
Specialist (Of Any Kind)	12	12	24	5	34	39	16	24	40	1	1	2	34	71	105
Chiropractor	10	0	10	12	55	67	12	16	28	0	0	0	34	71	105
Osteopath	1	9	10	0	4	4	33	58	91	0	0	0	34	71	105
Registered Nurse	7	2	9	13	55	68	14	14	28	0	0	0	34	71	105
Practical Nurse	12	3	15	12	53	65	10	15	25	0	0	0	34	71	105
Public Health Nurse	1	0	1	17	50	67	16	21	37	0	0	0	34	71	105
Dentist	4	0	4	18	53	71	12	18	30	0	0	0	34	71	105
Optometrist	0	0	0	17	46	63	16	25	41	1	0	1	34	71	105
Mental Health Consultant	1	1	2	17	44	61	15	26	41	1	0	1	34	71	105
Hospital	0	0	0	18	47	65	16	24	40	0	0	0	34	71	105
Ambulance Service	19	1	20	11	61	72	4	9	13	0	0	0	34	71	105

^aThe columns show discrete groupings rather than continuous groupings since households' responses were rounded to the nearest mile unless the distance was less than one mile.

for municipal/open country comparisons for each county subsample.

One can also determine from the data that the sampled households were generally closer to general practitioners, chiropractors, nurses, dentists, and ambulance services than they were to specialists, osteopaths, optometrists, mental health consultants, and hospitals. For example, 58.9 percent of the sampled households (147 of 250) were within ten miles of general practitioners while only 28.0 percent of the sampled households (70 of 250) reported that specialists were within ten miles from their respective residences.

The Use of Health Care Services

The number of sampled households which secured the services of selected health care services in the year prior to the survey is shown in Table V-12. In those instances in which a household's members had gone to a hospital but only for the purpose of "seeing" a general practitioner (and not to use a hospital's facilities), the situation was counted only as an appointment with a general practitioner. In the event that a nurse's services were secured during a household member's visit with a general practitioner, the visit was counted only as that household's use of a general practitioner's services. (The small percentage of sampled households which reported "use" of nurses' services was partially due to these adjustments.)

The health care services utilized by the greatest number of sampled households in the 12 months prior to the survey were those of general practitioners, dentists, and optometrists (see Table V-12). At least 70 percent of each county's sampled households had at least one

TABLE V-12. NUMBER OF HOUSEHOLDS REPORTING USE OF SELECTED HEALTH CARE PERSONNEL AND FACILITIES DURING THE LAST YEAR^a -- BY SAMPLE AND SUBSAMPLES

Type of Health Care Personnel or Facility	Haakon County			Grant County			Brookings County			3 County Total		
	Mun	OC	Total	Mun	OC	Total	Mun	OC	Total	Mun	OC	Total
General Practitioner	11	16	27	50	30	80	26	73	89	87	109	196
Specialist (Of Any Kind)	2	2	4	20	8	28	6	20	26	28	30	58
Chiropractor	1	7	8	15	9	24	3	22	25	19	38	57
Osteopath	0	0	0	6	2	8	0	0	0	6	2	8
Registered Nurse	2	3	5	4	1	5	1	1	2	7	5	12
Practical Nurse	1	0	1	0	0	0	0	0	0	1	0	1
Public Health Nurse	0	0	0	4	2	6	2	12	14	6	14	20
Dentist	7	12	19	33	29	62	13	43	56	53	84	137
Optometrist	1	8	9	27	18	45	3	32	35	31	58	89
Mental Health Consultant	0	0	0	0	0	0	2	0	2	2	0	2
Hospital	4	7	11	16	10	26	9	19	28	29	36	65
Ambulance Service	2	0	2	0	3	3	0	2	2	2	5	7
Total No. of Responding Households	16	19	35	62	48	110	34	71	105	112	138	250

^aThe "last year" refers to the year prior to the time an interview was conducted for each household.

household member who had "seen" a general practitioner at least once. Slightly more than half of the sampled households in each county had secured the services of dentists in the twelve months prior to the survey. Variations existed in the percent of the sampled households in each county which had used some of the other health care services. For example, approximately one-fourth of the sampled households in Grant and Brookings Counties had used specialists but only slightly more than one-tenth of the Haakon County sampled households had reported use of various kinds of specialists. Similar statements can be made about the use of chiropractors, public health nurses, and optometrists. On the other hand, a larger proportion of the sampled households in Haakon County had secured the services of registered or practical nurses in comparison to the proportions of sampled households in the other two counties.

It may have been that the differences in the rates of use among the counties were due to variations in the physical (and mental) well-being of the sampled household members. These differences may also have resulted from disparities in the availability of health personnel and facilities among the different counties. Without additional data and analysis, it is difficult to determine the accuracy of these hypotheses. The data are useful in determining which personnel or facilities were used by the largest number of households. In addition, those sampled households which had utilized one or more of the selected services were asked to supply additional information to allow the estimation of associated private costs which are reported in the section on costs.

Associated Private Costs

It was assumed that the principal components of associated private costs (nonmedical costs incurred by households in the process of obtaining health care) were costs for transportation, meals, lodging, lost wages and salaries, and fares for mass transportation. Automobile transportation costs were calculated for each household by multiplying the number of trips made to each service by the round trip mileage to each service. This figure was then multiplied by an arbitrary figure of \$0.16 (per mile) to estimate private automobile transportation costs. Fares for various kinds of mass transit, such as buses or airplanes, were considered separately and were based upon households' estimates of these fares. Meal costs were estimated by multiplying each household's reported number of meals by an arbitrarily determined figure of \$3.00. Lodging costs were arbitrarily set at \$15.00 per day of paid lodging and salary losses were calculated by multiplying the reported number of days of pay lost by an arbitrary amount of \$30.00.⁵

The costs for each selected service were summed for each responding household and then all households' costs for each service were totaled. This total was divided by all households' total trips to each service to arrive at the estimated costs per trip for each service.⁶ These estimated costs per trip are reported in Table V-13.

⁵The reader may recall that these arbitrary figures were the ones employed by the North Central Regional Research Committee (NC-102).

⁶The total number of reported trips and the estimated total associated private cost for each selected health service are shown in Appendix B.

TABLE V-13. ESTIMATED NONMEDICAL COSTS PER TRIP FOR SELECTED HEALTH CARE SERVICES — BY SAMPLE AND SUBSAMPLES

Service	Haakon County			Grant County			Brookings County			3 County Total		
	Mun	OC	Total	Mun	OC	Total	Mun	OC	Total	Mun	OC	Total
General Practitioner	\$274.77	\$17.27	\$93.00	\$3.23	\$7.53	\$5.12	\$3.38	\$3.64	\$3.56	\$24.18	\$6.60	\$13.91
General Practitioner (Revised)	7.86	17.27	15.00	3.23	7.53	5.12	3.38	3.64	3.56	3.57	6.60	5.35
Specialist (Of Any Kind)	20.03	32.48	27.20	71.58	48.97	59.97	31.27	57.54	52.53	46.14	53.80	51.58
Chiropractor	35.20	19.94	20.60	12.52	45.57	24.77	8.16	3.60	4.37	11.27	12.36	12.02
Osteopath	—	—	—	5.17	7.49	5.61	—	—	—	5.17	7.49	5.61
Registered Nurse	0.14	4.43	3.39	0.11	7.04	0.30	0.00	2.88	1.80	0.10	4.07	1.78
Practical Nurse	0.05	—	0.05	—	—	—	—	—	—	0.05	—	0.05
Public Health Nurse	—	—	—	1.49	1.60	1.51	6.03	3.20	3.70	2.85	3.00	2.94
Dentist	29.20	40.23	36.22	2.68	7.90	5.06	4.39	3.54	3.70	5.49	8.67	7.47
Optometrist	28.80	55.47	53.80	6.33	7.53	6.83	4.02	6.42	6.27	6.43	11.32	9.93
Mental Health Consultant	—	—	—	—	—	—	6.79	—	6.79	6.79	—	6.79
Hospital	3.63	30.82	22.17	13.48	36.74	25.79	8.46	16.28	14.06	10.38	25.49	20.00

Since the sampled households in the high population density county (Brookings) were generally closer to the selected health care services than were the sampled households in the less densely populated counties (Haakon and Grant), one would suspect that the nonmedical costs per trip would be lower for the more densely populated county. Because municipal households were also closer to these services than were the sampled open country households, one would suspect that the costs per trip would be lower for municipal households. These conclusions are generally supported by Table V-13, but there were exceptions. The exceptions resulted mostly from the fact that several responding households traveled to health care services which were more distant than the services which they had listed as being the "nearest."

The most noticeable exception can be found in the Haakon County data related to costs per trip for general practitioners' services. Average costs per trip were especially high for the sampled municipal households of Haakon County because one household reported unusually high costs. For this reason, the costs per trip for responding municipal households were higher than those of the responding open country households in Haakon County and for the total sample.⁷

Comparison of the costs per trip data of responding municipal and open country households with respect to the remaining services

⁷If one omits the total trips and estimated total costs of the municipal household with the exceptionally high costs (12 trips, \$13,440.00), then the cost per trip figures shown in the second row (General Practitioner, Revised) of Table V-13 are obtained. When this is done, the nonmedical costs per trip for general practitioners' services were lower for the responding municipal households than they were for the responding open country households of each county.

reveals an interesting fact. In each case in which a service had been utilized by both municipal and open country households (which were sampled), the costs per trip were lower for municipal households.⁸ In general, then, associated private costs per trip to each selected health care service were inversely related to the population density of each sampled county and were lower for the sampled municipal households than for the sampled open country households.

The Adequacy of Health Care Services

The health service problems which were encountered by the sampled households were generally related to shortages of personnel rather than to the quality of the services rendered. That is, problems such as had to wait too long for an appointment and had to wait too long in office (see Table V-14) most frequently reflected shortages of general practitioners, specialists, or dentists. It may be that the "long wait" in obtaining a general practitioner's assistance was more directly related to a shortage of supporting personnel such as nurses or lab technicians. However, the possibility that these two problems resulted because of the lack of either general practitioners, specialists, or dentists is considered more likely. Most of the responding households did not consider the "quality" of the health care they had received to be unacceptable. Only three households cited a quality problem --

⁸As stated previously, this particular observation was generally applicable to the municipal/open country data from each county.

TABLE V-14. THE ADEQUACY OF HEALTH CARE SERVICES — NUMBER OF HOUSEHOLDS RESPONDING, THREE COUNTY TOTAL

Problem	Number Having this Problem in Last Three Years		Number Listing This Problem as the One They Most Wanted Eliminated		Number Willing to Pay, to Eliminate this Problem		Number Willing to Pay Specified Amounts to Eliminate this Problem				Are You Getting Your Money's Worth? -- by Type of Problem Wanted Eliminated									
	MUN	OC	MUN	OC	MUN	OC	No Estimate		Under \$5		\$5 to \$10		Over \$10		Yes		No		Don't Know	
							MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC
Unable to Obtain an Appointment	1	2	1	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0
Had to Wait too Long for an Appointment	6	23	3	16	0	3	0	0	0	1	0	2	0	0	3	11	0	5	0	0
Had to Wait too Long in Office	22	34	18	27	4	3	2	0	0	2	1	1	1	0	14	20	2	6	2	1
Lack of Transportation	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Referred to Another Doctor, Wait for an Appointment	4	3	4	1	0	0	0	0	0	0	0	0	0	0	4	1	0	0	0	0
Inefficient Emergency Treatment	2	1	1	1	0	1	0	1	0	0	0	0	0	0	1	0	0	1	0	0
Other	<u>2</u>	<u>3</u>	<u>1</u>	<u>2</u>	<u>1</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>1</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>1</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>0</u>
SUBTOTAL	<u>29</u>	<u>48</u>	<u>29</u>	<u>48</u>	<u>5</u>	<u>8</u>	<u>2</u>	<u>1</u>	<u>0</u>	<u>3</u>	<u>2</u>	<u>4</u>	<u>1</u>	<u>0</u>	<u>23</u>	<u>34</u>	<u>4</u>	<u>13</u>	<u>2</u>	<u>1</u>
None			<u>82</u>	<u>89</u>											<u>79</u>	<u>70</u>	<u>1</u>	<u>11</u>	<u>3</u>	<u>3</u>
TOTAL			<u>110</u>	<u>137</u>											<u>102</u>	<u>104</u>	<u>5</u>	<u>24</u>	<u>5</u>	<u>4</u>

^aNo entry is made since this total would represent the number of problems reported and not the number of responding households.

insufficient emergency treatment.⁹

Although 77 of the 248 responding households (31.0 percent) identified various health care problems, only 13 of these most wanted to eliminate problems other than had to wait too long for an appointment and had to wait too long in office (see Table V-14). Over one-half of the sampled households with problems (45 of 77) most wanted to eliminate the problem of had to wait too long in office (of a general practitioner in most cases). An additional 19 households (mostly open country) most wanted to eliminate the problem of had to wait too long for an appointment. The elimination of either of these two problems would require additional health care personnel and perhaps additional facilities. In order to increase these services, additional costs would need to be incurred. However, only ten sampled households were willing to pay additional amounts monthly to eliminate either of these two problems and a total of only 13 sampled households indicated any willingness to pay extra for all of the health care problems combined. As it was, 29 sampled households did not think that they were getting their money's worth from the expenditures they had made on health care services.

The two problems characterized by "long waits" were the only notable problems in each of the three sampled counties. An interesting

⁹It may have been that there were relatively few problems of this kind or it was possible that respondents were unduly biased by the list of problems presented in the questionnaire (which contained the first five problems listed in Tables V-14, V-15, V-16, and V-17). It is difficult to determine which situation, if either, was the case without conducting another survey which might unduly bias respondents in the direction of quality problems. The reader should, however, keep in mind the possibility that responses on problems were unduly biased by the format of the questionnaire.

TABLE V-15. THE ADEQUACY OF HEALTH CARE SERVICES — NUMBER OF HOUSEHOLDS RESPONDING, HAAKON COUNTY

Problem	Number Having this Problem in Last Three Years		Number Listing This Problem as the One They Most Wanted Eliminated		Number Willing to Pay to Eliminate this Problem		Number Willing to Pay Specified Amounts to Eliminate this Problem						Are You Getting Your Money's Worth? — by Type of Problem Wanted Eliminated							
							No Estimate		Under \$5		\$5 to \$10		Over \$10		Yes		No		Don't Know	
	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC
Unable to Obtain an Appointment	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Had to Wait too Long for an Appointment	1	3	1	2	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0
Had to Wait too Long in Office	4	5	3	5	1	1	0	0	0	1	1	0	0	0	0	3	5	0	0	0
Lack of Transportation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Referred to Another Doctor, Wait for an Appointment	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Inefficient Emergency Treatment	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	1	1	1	1	1	1	0	0	0	0	1	1	0	0	0	0	1	1	0	0
SUBTOTAL	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>2</u>	<u>2</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>1</u>	<u>2</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>5</u>	<u>8</u>	<u>1</u>	<u>0</u>	<u>0</u>
None			10	11												10	9	0	0	0
TOTAL			16	19												15	17	1	0	0

^aNo entry is made since this total would represent the number of problems reported and not the number of responding households.

TABLE V-16. THE ADEQUACY OF HEALTH CARE SERVICES -- NUMBER OF HOUSEHOLDS RESPONDING, GRANT COUNTY

Problem	Number Having this Problem in Last Three Years		Number Listing This Problem as the One They Most Wanted Eliminated		Number Willing to Pay to Eliminate this Problem		Number Willing to Pay Specified Amounts to Eliminate this Problem						Are You Getting Your Money's Worth? -- by Type of Problem Wanted Eliminated							
							No Estimate		Under \$5		\$5 to \$10		Over \$10		Yes		No		Don't Know	
	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC
Unable to Obtain an Appointment	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Had to Wait too Long for an Appointment	3	5	2	5	0	2	0	0	0	1	0	1	0	0	2	3	0	2	0	0
Had to Wait too Long in Office	8	3	7	1	0	1	0	0	0	0	0	1	0	0	4	0	2	1	1	0
Lack of Transportation	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Referred to Another Doctor, Wait for an Appointment	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0
Inefficient Emergency Treatment	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
SUBTOTAL	<u>1</u> ^a	<u>1</u> ^a	11	8	0	3	0	0	0	1	0	2	0	0	7	4	3	4	1	0
None			49	39											48	33	1	5	2	1
TOTAL			60	47											55	37	4	9	3	1

^aNo entry is made since this total would represent the number of problems reported and not the number of responding households.

TABLE V-17. THE ADEQUACY OF HEALTH CARE SERVICES — NUMBER OF HOUSEHOLDS RESPONDING, BROOKINGS COUNTY

Problem	Number Having this Problem in Last Three Years		Number Listing This Problem as the One They Most Wanted Eliminated		Number Willing to Pay to Eliminate this Problem		Number Willing to Pay Specified Amounts to Eliminate this Problem								Are You Getting Your Money's Worth? -- by Type of Problem Wanted Eliminated					
							No Estimate		Under \$5		\$5 to \$10		Over \$10		Yes		No		Don't Know	
	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC	MUN	OC
Unable to Obtain an Appointment	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Had to Wait too Long for an Appointment	2	15	0	9	0	1	0	0	0	0	0	1	0	0	0	6	0	3	0	0
Had to Wait too Long in Office	10	26	8	21	3	1	2	0	0	1	0	0	1	0	7	15	0	5	1	1
Lack of Transportation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Referred to Another Doctor, Wait for an Appointment	3	2	3	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0
Inefficient Emergency Treatment	1	1	1	1	0	1	0	1	0	0	0	0	0	0	1	0	0	1	0	0
Other	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	<u>12</u> ^a	<u>32</u> ^a	<u>12</u>	<u>32</u>	<u>3</u>	<u>3</u>	<u>2</u>	<u>1</u>	<u>0</u>	<u>1</u>	<u>0</u>	<u>1</u>	<u>1</u>	<u>0</u>	<u>11</u>	<u>22</u>	<u>0</u>	<u>6</u>	<u>1</u>	<u>1</u>
None			<u>22</u>	<u>39</u>											<u>21</u>	<u>28</u>	<u>0</u>	<u>6</u>	<u>1</u>	<u>0</u>
TOTAL			<u>34</u>	<u>71</u>											<u>32</u>	<u>50</u>	<u>0</u>	<u>15</u>	<u>2</u>	<u>1</u>

^aNo entry is made since this total would represent the number of problems reported and not the number of responding households.

finding was that nearly two-thirds of the sampled households which indicated that having to wait too long in office was the problem that they most wanted to see eliminated (29 of 45) were located in Brookings County (see Tables V-14 and V-17). This finding does not necessarily mean that Brookings County residents generally had to wait longer than the residents of the other two counties which had fewer health personnel. Rather, it may have been that smaller percentages of the sampled households in Haakon and Grant Counties considered a long wait in the office to be troublesome. Regardless of this possibility, no more than 5.7 percent of the sampled households in any county were willing to pay more to correct this problem.

With the exception of the Haakon County subsample there were more households that thought that they were not getting their money's worth than there were households which were willing to pay extra. Only three sampled households in Grant County and six in Brookings County were willing to pay additional monthly amounts to correct problems whereas 13 sampled households in Grant County and 15 in Brookings County indicated that they were not getting their money's worth (see Tables V-15, V-16, and V-17). Haakon County had the largest percentage of sampled households which were willing to pay extra although this figure was less than 12 percent (4 of 35) (see Table V-15).

Summary

Two services, education and health care, were considered in this chapter. With respect to formal education, topics covered included enrollment levels, total and average private costs, and households'

judgments concerning the adequacy of the service. The adequacy aspect was also considered in relation to health care services. Other health care considerations covered were the distances to the nearest health care services, utilization rates (within the last year), and the estimation of associated private costs per trip to selected health care services.

Several education findings were of special interest. Among the responding households, 109 households had 225 members enrolled in formal education for an average enrollment of 2.06 students per household (with members enrolled). Average sampled enrollment was lower in the municipal areas than in the open country areas (1.90 and 2.16, respectively) as were estimated average private costs per households (\$576.68 and \$991.74, respectively). However, average private costs per student were lower for the responding open country households than they were for the responding municipal households (\$274.32 and \$303.92, respectively).

Over two-thirds of the responding households were dissatisfied with some aspect of education but many households' responses were at odds as to which problems should be eliminated. The most obvious dilemma between problems was that involving high costs (high taxes) and lack of funding. Overall, 67.7 percent of the responding households cited various education service problems, 24.6 percent were willing to pay additional monthly amounts, and 13.7 percent thought that they were not getting their money's worth from their "current" expenditures on education.

A similar percentage of the responding households thought that they were not getting their money's worth for expenditures on health

care services (11.9 percent). However, the other figures on health care adequacy contrasted sharply with those on education. Only 31.0 percent of the responding households had experienced various health care services problems and only 5.2 percent were willing to pay more for the elimination of these problems.

Other interesting facets of health care services include the following. Municipal households were generally nearer to the selected health care services than were open country households. Among the various health care services, general practitioners' services had been utilized by the greatest number of households. Nonmedical costs led to the conclusion that municipal households' costs per trip were generally lower than those of open country households and that these same costs were generally inversely related to the population density of the sampled counties.

CHAPTER VI

SUMMARY AND IMPLICATIONS

The services studied in this thesis were household water, sewage disposal, solid waste management, fire protection, law enforcement, formal education, and health care services. The purpose was to sample consuming households as to their views on various aspects of these services. The data obtained provide suppliers with additional insight on consumer preferences upon which decisions can be made concerning the adequacy of existing service levels. The consumer survey method was employed to yield information on the preferences of consuming households located in rural environments of South Dakota.

The survey procedure and prevalent aspects of household consumption are discussed in the next two sections. Adequacy of the seven services is summarized and various implications are discussed in the following section. The final section contains some suggestions for further research.

Survey Procedure

The population was the set of consuming households in South Dakota with the exception of those located in major trade centers and native American reservations. A multistage sampling plan was employed. The sampling plan was designed to derive greater precision of the estimates sought (than would result from a simple random sampling plan).

The three stages of the sampling plan were stratification by counties and by municipal and open country areas and clustering of the

municipal and open country areas. The criteria used for selecting Haakon, Grant, and Brookings Counties were population density, economic base, and size of the trade center. Each county was stratified into municipal and open country locations with organized municipalities defined by their city limits. The remainder of each county was considered "open country." Each set of locations was then sectioned into clusters and the clusters were randomly selected. The sample size was 250 and was proportionately allocated between the counties and the locations within the counties according to the proportion of the 1970 Census population that each county and location had of the total. A personal interview technique was utilized in order to survey the selected households. Up to three calls were made on each household to attempt to obtain an interview. The interviews took place from May through August, 1976.

Prevalent Aspects of Household Consumption of Selected Services

Household responses on specific aspects of the selected service systems are summarized for each service in this section. For particular services these considerations might include principal sources, costs, and utilization rates.

Household Water

The type of water system used was closely related to a household's location. Approximately 90 percent of the municipal households utilized a municipal water system whereas nearly 36 percent of the open country households had private wells. Although households may have misunderstood the question of "available" substitutes, nearly 20 percent of the

responding households indicated that they had a substitute available. The most frequently cited substitutes were private wells and private water systems (other than private wells).

Only the data pertaining to municipal household water costs (and sewage costs) were considered reliable. Average monthly costs among municipal households ranged from a high of \$6.43 in Haakon County to a low of \$2.69 in Brookings County. The average monthly costs may have been higher in Haakon County because of higher prices or because of greater consumption of water.

Sewage Disposal

The type of sewage disposal system used was associated with a household's location, as in the case of water. A municipal system was employed by 34.3 percent of the municipal households while 93.6 percent of the open country households reported use of some form of a private system. Ninety percent of the open country households had a septic tank and 7.2 percent (10 of 133) had privies. Average monthly costs were generally \$2.50 for municipal households in Grant and Brookings counties and approximately \$3.00 in Haakon County.

Solid Waste Management

Approximately 90 percent of the municipal households utilized a "community" solid waste collection system (municipal or commercial) and 90 percent of the open country households hauled their own solid wastes. The 42.0 percent that responded that there were substitute collection systems available generally thought that they could haul their own garbage. Households which employed a municipal or commercial

collection system generally had average monthly costs of \$2.50. Costs for "hauling" households varied depending upon the average number of monthly trips and round trip mileage.

Fire Protection

All of the municipal households indicated that their principal source of fire protection was a municipal fire department. Most of the open country households relied on a combined municipal-rural fire department or a municipal fire department. Nearly all of the households indicated donations and/or fund raising and approximately 60 percent indicated taxation as sources of financing. One-tenth of the households had had fires in the last three years and three-fourths of these were in open country areas. A fire department was called in 25 instances and had responded in all but one case. The response time was within 15 minutes in 20 of the 24 cases in which a fire department responded.

Law Enforcement

Nearly all households indicated that various county sheriffs' departments and the state Highway Patrol were available. Most municipal households had municipal police departments available. Approximately two-thirds of the municipal households and one-third of the open country households responded that a "regular" patrol was made past their property. Over 95 percent of the households indicated that law enforcement officers were available on call. Generally, municipal households were nearer to a law enforcement office than were open country households. Moreover, this distance among open country households was inversely related to the population density of the three sampled counties.

Fifty-two of the 250 sampled households had requested law enforcement assistance. The most frequently cited reasons for having requested assistance were auto accidents and burglaries and/or thefts. Assistance was rendered in 49 of the cases. Response times varied greatly but the greatest share of households (43 of 49) indicated that the response time was three hours or less. Approximately 34 percent of the households which had requested assistance were satisfied with the assistance they had received.

Formal Education

Approximately 44 percent of the households had at least one household member enrolled in formal education. Among those households with members enrolled, the average enrollment per household was 2.06 students. The private costs considered were not only the costs of consumption (such as tuition) but also associated costs (such as transportation costs for classroom attendance). The private costs for the previous year for households with enrolled members were \$234.05 per student and \$536.35 per household. Costs per student were lower among open country households than among municipal households -- \$274.32 and \$303.92, respectively. However, average enrollment was greater for open country households than for municipal households.

Health Care

Generally, municipal households were located nearer selected health care personnel. For example, nearly 76 percent of the sampled municipal households but only 44.9 percent of the open country households resided within 10 miles of the nearest general practitioner.

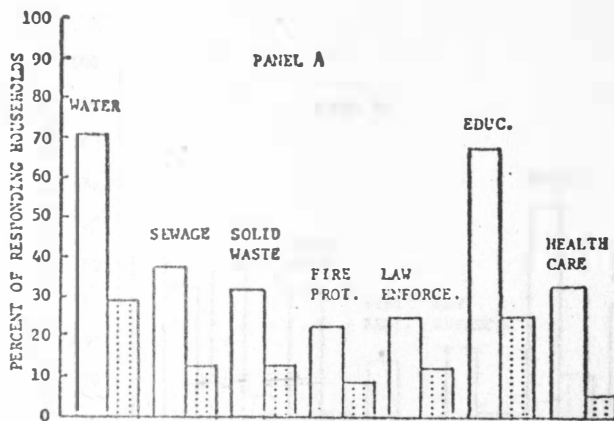
Health care personnel most commonly used by households were general practitioners and dentists. Generally, costs per trip to the selected health care services were lower for municipal households than for open country households. Moreover, costs per trip were, in general, inversely related to the population density of the sampled counties.

Adequacy of the Selected Services

The major emphasis in this thesis has been on data pertaining to households' perceptions of the adequacy of each service. Specifically, discussion centered upon the problems most wanted eliminated, the willingness to pay to correct the problems, and whether responding households thought that they were getting their money's worth from "current" expenditures on the selected services. Contrary to the method adhered to in Chapters III, IV, and V in which household perceptions were reported separately for each service, results are compared between services. In this way, implications are drawn regarding which selected services are considered least adequate by households and, consequently, which services most require improvement.

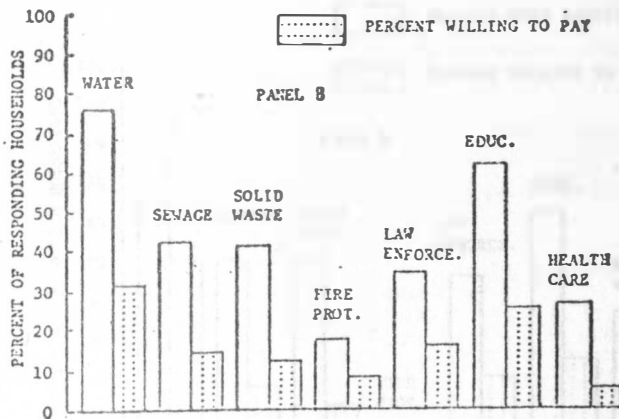
Selected findings associated with the adequacy of the seven services are reviewed and discussed in the remainder of this section. These findings are the percent of responding households with problems (in the last three years), the percent of responding households willing to pay more to correct various problems, and the percent of responding households not getting their money's worth. Bar graphs of the first two sets of percentages are shown in Figures VI-1, VI-2, VI-3, and VI-4. The percent of households not getting their money's worth is reported

THREE COUNTY TOTAL



PERCENT WITH PROBLEMS
 PERCENT WILLING TO PAY

MUNICIPAL



OPEN COUNTRY

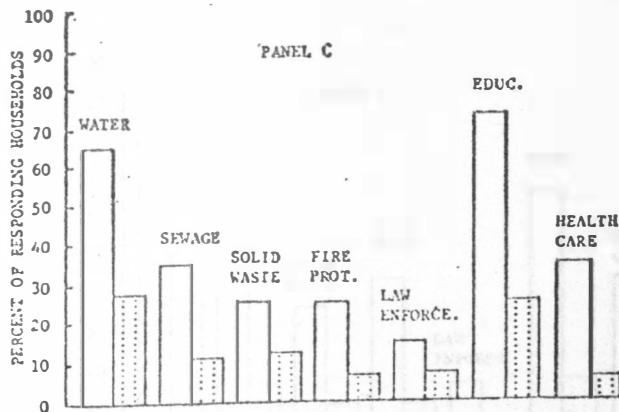


Fig. VI-1. Percent of responding households with service problems in the last three years and percent of responding households willing to pay more to correct various service problems in the three counties.

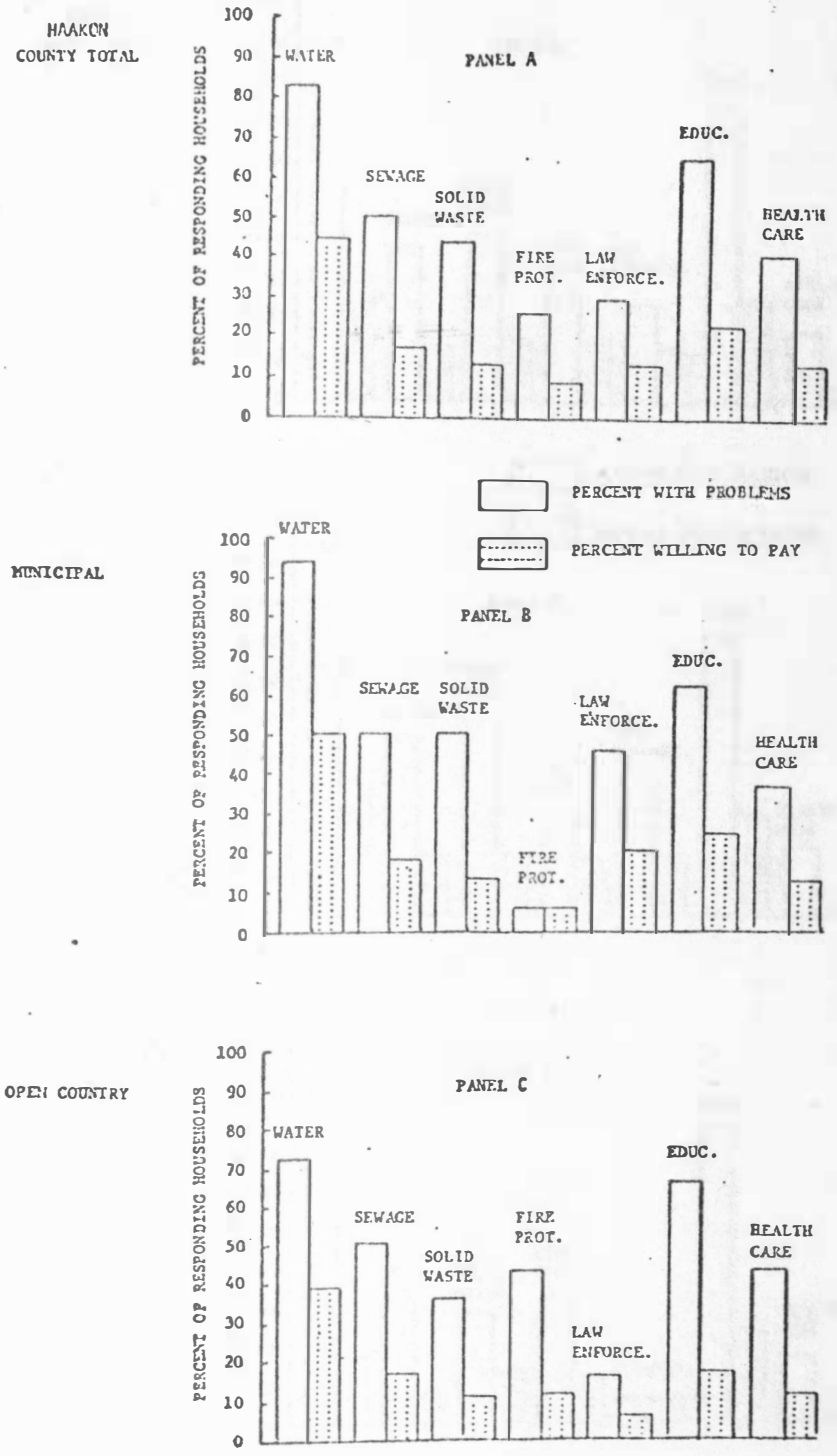


Fig. VI-2. Percent of responding households with service problems in the last three years and percent of responding households willing to pay more to correct various service problems in Haakon County.

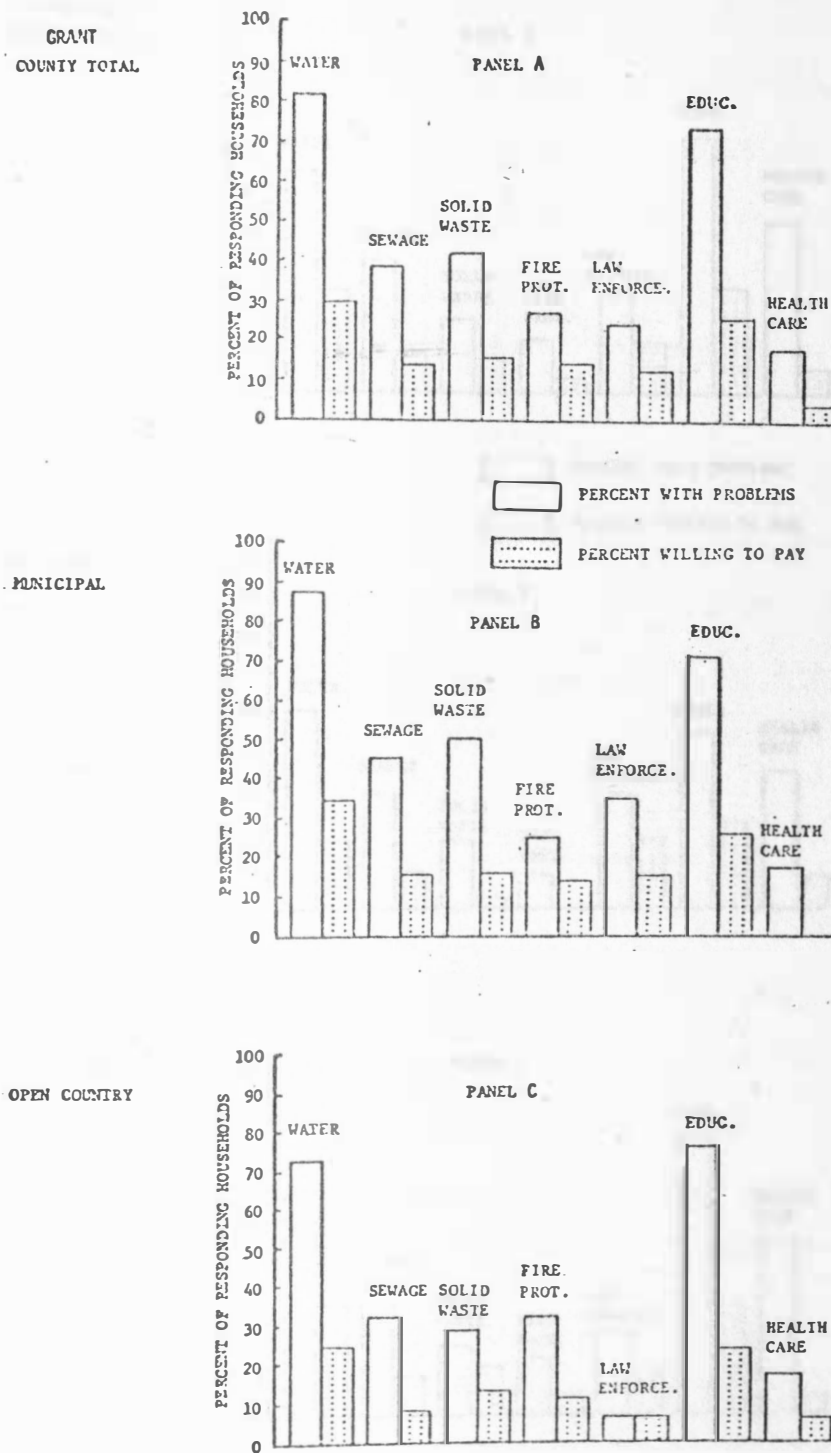
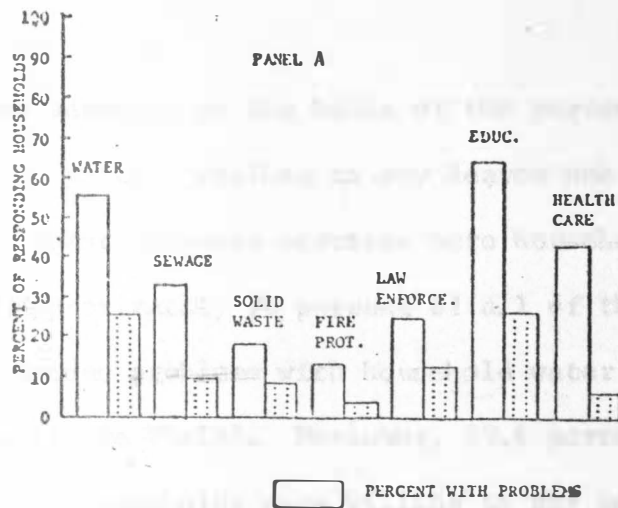
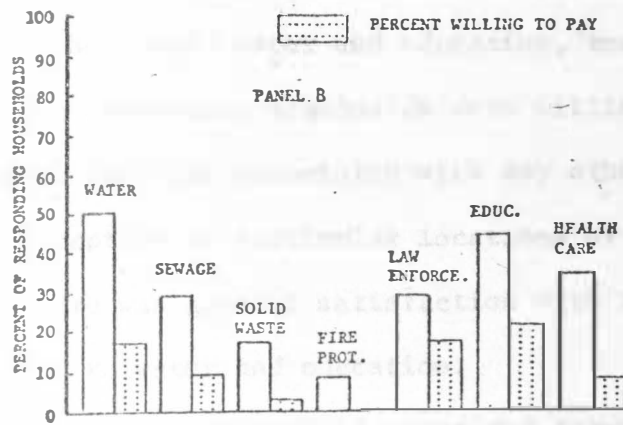


Fig. VI-3. Percent of responding households with service problems in the last three years and percent of responding households willing to pay more to correct various service problems in Grant County.

BROOKINGS COUNTY TOTAL



MUNICIPAL



OPEN COUNTRY

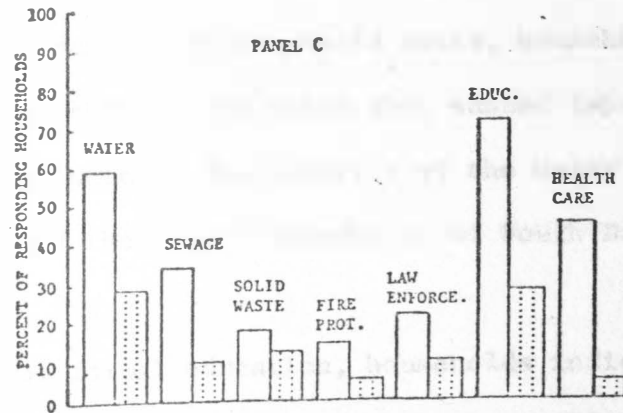


Fig. VI-4. Percent of responding households with service problems in the last three years and percent of responding households willing to pay more to correct various service problems in Brookings County.

in Table VI-1.

Analyzing the services on the basis of the percent of households with problems and the percent willing to pay leaves one with the conclusion that the least adequate services were household water and formal education. Approximately 70 percent of all of the responding households listed various problems with household water services and with education (see Figure VI-1A). Moreover, 29.4 percent and 24.6 percent of the responding households were willing to pay more to correct various problems with household water and education, respectively. Less than 12 percent of the responding households were willing to pay more to correct the various problems associated with any other particular service. With the exception of particular locations or counties (discussed below), there was general satisfaction with the other five services when compared to water and education.

The implication is that household water and formal education are the services for which there is the greatest demand for improvement and/or change. With respect to household water, households indicated that those aspects of the service which they wanted improved were the supply and quality of water. The severity of the water supply problem may be a reflection of the recent drought or of South Dakota's permanent water problem.

In the case of formal education, households indicated their concern with a variety of topics, many of which conflicted with one another. While a relatively large percentage of households were willing to increase their payments for educational improvements, many

thought that local taxes were already too high. This latter statement was especially evident among open country households. Furthermore, the finding that 13.7 percent of the households were dissatisfied with the return they had received from expenditures on education (see Table VI-1) indicates that many households perceived that more educational services could have been provided with the available budget.

For particular locations and counties certain services stood out as ones for which households perceived some need for change. Household perceptions of the adequacy of solid waste management in municipalities are noteworthy. Although only 11.6 percent of the responding municipal households were willing to pay more to eliminate various solid waste management problems, over 40 percent reported having had problems (see Figure VI-1B) and more than 16 percent thought that they were not getting their money's worth (see Table VI-1). The fact that over 14 percent of the responding municipal households had encountered the problem of inadequate, inconvenient, or incompetent garbage collection suggests that many municipal households thought that a more adequate and perhaps efficient job could be done in collecting their garbage. The percent of municipal households with problems and the percent not getting their money's worth were particularly high in Haakon and Brookings Counties as compared to Grant County (see Figures VI-2B, VI-3B, and VI-4B and Table VI-1).

Another important observation relates to the percent of open country households in Grant and Brookings Counties which thought that they were not getting their money's worth from "current" expenditures on health care. Approximately one-fifth of the open country households

TABLE VI-1. PERCENTAGE OF RESPONDING HOUSEHOLDS WHICH REPORTED NOT GETTING THEIR MONEY'S WORTH FOR THE SELECTED SERVICES -- BY SAMPLE AND SUBSAMPLES

	<u>Haakon County</u>			<u>Grant County</u>			<u>Brookings County</u>			<u>3 County Total</u>		
	Mun	OC	Total	Mun	OC	Total	Mun	OC	Total	Mun	OC	Total
Household Water	0.0	0.0	0.0	6.5	6.3	6.4	0.0	2.8	0.0	3.6	3.6	3.6
Sewage Disposal	0.0	0.0	0.0	1.6	0.0	0.9	2.9	0.0	1.0	1.8	0.0	0.8
Solid Waste Management	31.3	0.0	14.3	9.7	0.0	5.5	20.6	2.8	8.6	16.1	1.5	8.0
Fire Protection	0.0	0.0	0.0	0.0	0.0	0.0	2.9	1.4	1.9	0.9	0.7	0.8
Law Enforcement	25.0	0.0	11.4	5.0	8.3	6.5	11.8	7.0	8.6	10.0	6.5	8.1
Education	12.5	26.3	20.0	13.1	14.9	13.9	11.8	11.3	11.4	12.6	14.6	13.7
Health Care	6.3	0.0	2.9	6.5	19.2	11.9	0.0	22.7	15.0	4.5	18.2	11.9

in these counties indicated that they were not getting a satisfactory return from their expenditures on health care (see Table VI-1). These data may explain why there were relatively few open country households which were willing to pay more in either of these two counties (see Figures VI-3C and VI-4C). Presumably, many households were of the opinion that health care personnel were receiving medical care payments which were too high in relation to the services rendered.

In conclusion, the data obtained from rural area households in South Dakota by means of this pilot study suggest that household water services and education were those services with which households were least satisfied. Several households thought they were not receiving a fair return from their expenditures on three services -- education, solid waste management (municipal areas), and health care (open country areas).

Suggestions for Further Research

The following discussion of areas for additional research are limited to water and education. The suggestions are not intended to be exhaustive with reference to these two services or of the research potentials following from the consumer survey.

With reference to water, studies estimating the demand elasticity for both private and commercial uses of water would be an aid for designing pricing arrangements, especially when water is publicly provided. Estimation of cost functions would also be useful. For instance, by analyzing cost functions for water provision in combination with demand elasticities, one could gain some perspective of the size of

a water delivery system that would be necessary in order to ensure efficient and "adequate" provision for various communities.

Research into the economic benefits and costs that an educational institution creates for the community in which it is located would be useful. It would be desirable to have a proxy that could be used for educational input. This would be true for benefit-cost analysis or voter behavior research. To assist in the development of an input proxy, the researcher might want to consider such things as the educational level of teachers, teaching hours per day and teaching days per year, students' learning capabilities (one measure of which is intelligence quotients), and the quantity and quality of teaching aids and educational facilities.

Concerning the costs of education, additional research might compare existent associated private costs with the costs of alternative methods of obtaining education. For example, one could compare existing transportation costs with the cost of providing dormitories at the secondary educational level. It may be that it is more efficient, and acceptable to parents, to house students in consolidated high school dormitories than to "bus" students long distances to local schools.

BIBLIOGRAPHY

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BIBLIOGRAPHY

- Broom, H.N. "New Random Sampling Numbers," Baylor Business Studies, No. 1. Waco, Texas: The Baylor University School of Business, 1965.
- Brunn, R. Beto, and Jones, Lonnie L. "Supply and Demand of Community Services: A Conceptual Analysis," Public Services for Rural Communities: Some Analytical and Policy Considerations Great Plains Agricultural Council Publication No. 70, Texas Agricultural Experiment Station, Texas A&M University, College Station, Texas, January, 1975, pp. 25-46.
- Deacon, Robert T. "Review of the Literature on the Demand for Public Services." Paper presented at the National Conference on Nonmetropolitan Community Services Research, Ohio State University, January 11-13, 1977. (Mimeographed.)
- Due, John F., and Friedlaender, Ann F. Government Finance: Economics of the Public Sector. Homewood, Illinois: Richard D. Irwin, Inc., 1973.
- Gessaman, Paul H. "Delivery Systems and Decision Making for Rural Community Services: Some Implications for Research," Public Services for Rural Communities: Some Analytical and Policy Considerations Great Plains Agricultural Council Publication No. 70, Texas Agricultural Experiment Station, Texas A&M University, College Station, Texas, pp. 1-24.
- Hirsch, Werner Z. The Economics of State and Local Governments. New York: McGraw-Hill Book Company, Inc., 1970.
- Institute of Social Sciences for Rural-Urban Research and Planning. Human Needs Assessment of the Fourth, Fifth and Sixth Planning Districts, South Dakota. Final report prepared for the South Dakota Department of Social Services. Brookings, South Dakota: South Dakota State University, 1974.
- Musgrave, Richard A., and Musgrave, Peggy B. Public Finance in Theory and Practice. New York: McGraw-Hill Book Company, Inc., 1973.
- Nelson, Bill. "Research Design: NC-102, Multistate Project." North Dakota State University, Fargo, North Dakota, July 30, 1974. (Mimeographed.)
- Powers, Mark J., and Bierman, Leland G. Supply and Demand of Medical Services in Northwest South Dakota: An Economic Analysis. Agricultural Experiment Station, Economics Department, Bulletin No. 568, South Dakota State University, Brookings, South Dakota, 1970.

- Rand Corporation. A Million Random Digits. Glencoe, Illinois: The Free Press, 1955.
- Seneca, Joseph J., and Taussig, Michael K. Environmental Economics. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1974.
- South Dakota. Department of Public Safety. Division of Highway Patrol, District 1. Telephone conversation, April 20, 1977.
- South Dakota. South Dakota Compiled Laws, Annotated, 1967. Indianapolis: The Allen Smith Company, 1974. Vol. XI.
- South Dakota. State Legislative Research Council. The Physician Shortage in South Dakota. Staff memorandum prepared for the South Dakota House of Representatives in conjunction with House Resolution No. 3 (1-16-68). Pierre, South Dakota, September 6, 1968.
- Steiner, Peter O. Public Expenditure Budgeting. Washington, D.C.: The Brookings Institution, 1969.
- U.S. Congress. House. Committee on Agriculture. Federal Health Policies in Rural Areas. Appendix to hearings before a subcommittee on Agriculture, 93d Cong., 2d sess., 1974.
- U.S. Department of Agriculture. Rural Development Service. Health Services in Rural America, by Tresa H. Matthews. Agriculture Information Bulletin No. 362. Washington, D.C.: Government Printing Office, 1973.
- U.S. Department of Agriculture. Soil Conservation Service. Land Resource Regions and Major Resource Areas of the United States, by Morris E. Austin. Agriculture Handbook No. 296. Washington, D.C.: Government Printing Office, 1972.
- U.S. Department of Commerce. Bureau of the Census. Census of Population: 1970. Vol. 1, Characteristics of the Population; Part 43, South Dakota. Washington, D.C.: Government Printing Office, 1973.
- Winkler, Robert W., and Hays, William L. Statistics: Probability, Inference, and Decision. 2nd ed. New York: Holt, Rinehart and Winston, Inc., 1975.

APPENDIX A

This Appendix would not be included in the final report.

The Appendix was prepared by the author of the report on the basis of the information available to him at the time of the preparation of the report.

TABLE A-1. NUMBER OF SURVEYED HOUSEHOLDS AND RESPONSE RATES — BY SAMPLE AND SUBSAMPLES

Type	Haakon County			Grant County			Brookings County			3 County Total		
	Mun	OC	Total	Mun	OC	Total	Mun	OC	Total	Mun	OC	Total
Households Approached for Interviews	26	29	55	88	71	159	52	113	165	166	213	379
Interviewed	16	19	35	62	48	110	34	71	105	112	138	250
Not Interviewed	10	10	20	26	23	49	18	42	60	54	75	129
Refused	4	5	9	13	14	27	10	21	31	27	40	67
Not at Home	6	2	8	13	9	22	8	21	29	17	32	59
Other ^a	0	3	3	0	0	0	0	0	0	0	3	3
Response Rate ^b	.615	.655	.636	.705	.676	.692	.654	.628	.636	.675	.648	.660

^aThe households could not be reached because the roads were impassible.

^bThe response rate in each column is equal to the number of households interviewed divided by the number of households approached for interviews.

TABLE B-1. NUMBER OF TRIPS FOR SELECTED HEALTH CARE SERVICES -- BY SAMPLE AND SUBSAMPLES

Service	Haakon County			Grant County			Brookings County			3 County Total		
	Mun	OC	Total	Mun	OC	Total	Mun	OC	Total	Mun	OC	Total
General Practitioner	50	120	170	349	272	621	251	520	771	650	912	1,562
General Practitioner (Revised)	38	120	158	349	272	621	251	520	771	638	912	1,550
Specialists	14	19	33	36	38	74	37	157	194	87	214	301
Chiropractor	1	22	23	73	43	116	37	182	219	111	247	358
Osteopath	0	0	0	21	5	26	0	0	0	21	5	26
Registered Nurse	8	25	33	35	1	36	6	10	16	49	36	85
Practical Nurse	1	0	1	0	0	0	0	0	0	1	0	1
Public Health Nurse	0	0	0	14	4	18	6	28	34	20	32	52
Dentist	20	35	55	151	127	278	46	196	242	217	358	575
Optometrist	1	15	16	55	39	94	7	105	112	63	159	222
Mental Health Consultant	0	0	0	0	0	0	12	0	12	12	0	12
Hospital	7	15	22	22	24	46	15	38	53	44	77	121
Ambulance Service	2	0	2	0	6	6	0	2	2	2	8	10

TABLE B-2. ESTIMATED TOTAL NONMEDICAL COSTS FOR SELECTED HEALTH CARE SERVICES -- BY SAMPLE AND SUBSAMPLES

Service	Haakon County			Grant County		
	Mun	OC	Total	Mun	OC	Total
General Practitioner	\$13,738.54	\$2,071.84	\$15,810.38	\$1,128.54	\$2,048.44	\$3,176.98
General Practitioner (Revised)	298.54	2,071.84	2,370.38	1,128.54	2,048.44	3,176.98
Specialists	280.40	617.08	897.48	2,576.80	1,860.68	4,437.48
Chiropractor	35.20	438.60	473.80	914.14	1,959.48	2,873.62
Osteopath	-----	-----	-----	108.52	37.44	145.96
Registered Nurse	1.12	110.72	111.84	3.86	7.04	10.90
Practical Nurse	0.05	-----	0.05	-----	-----	-----
Public Health Nurse	-----	-----	-----	20.86	6.40	27.26
Dentist	584.08	1,407.92	1,992.00	404.61	1,003.16	1,407.77
Optometrist	28.80	832.00	860.80	348.25	293.64	641.88
Mental Health Consultant	-----	-----	-----	-----	-----	-----
Hospital	25.44	462.36	487.80	304.56	881.65	1,186.21

TABLE B-2. continued

Service	Brookings County			3 County Total		
	Mun	OC	Total	Mun	OC	Total
General Practitioner	\$ 848.13	\$1,895.04	\$2,743.17	\$15,715.21	\$6,015.32	\$21,730.53
General Practitioner (Revised)	848.13	1,895.04	2,743.17	2,275.21	6,015.32	8,290.53
Specialists	1,156.88	9,034.40	10,191.28	4,014.08	11,512.16	15,526.24
Chiropractor	301.74	654.96	956.70	1,251.08	3,053.04	4,304.12
Osteopath	-----	-----	-----	108.52	37.44	145.96
Registered Nurse	0.00	28.80	28.80	4.98	146.56	151.54
Practical Nurse	-----	-----	-----	0.05	-----	0.05
Public Health Nurse	36.16	89.60	125.76	57.02	96.00	153.02
Dentist	202.08	693.20	895.28	1,190.77	3,104.28	4,295.05
Optometrist	28.16	673.88	702.04	405.21	1,799.52	2,204.73
Mental Health Consultant	81.52	-----	81.52	81.52	-----	81.52
Hospital	126.84	618.56	745.40	456.84	1,962.57	2,419.41

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APPENDIX C

Chi square tests of independence were conducted on the data related to the categories shown in the two columns of Table C-1. Each hypothesis in Table C-1 is numbered for easy reference to the computed probability levels (p-levels) presented in Table C-2. The Statistical Package for Social Sciences (SPSS) was utilized to "run" these tests. Each computed probability level shown in Table C-2 is the probability that the variability in the categorical data were due to chance variation assuming that the hypothesis of independence was true.

TABLE C-1. DESCRIPTIONS OF THE CATEGORIZATIONS THAT WERE TESTED FOR INDEPENDENCE

Number	Test of Hypothesis of Independence Between	
	Categorical Data On:	And Categorical Data On:
1	county (Haakon, Grant, Brookings)	problem most wanted eliminated
2	location of all responding households (Mun, OC)	problem most wanted eliminated
3	location of responding households in Haakon County (Mun, OC)	problem most wanted eliminated
4	location of responding households in Grant County (Mun, OC)	problem most wanted eliminated
5	location of responding households in Brookings County (Mun, OC)	problem most wanted eliminated
6	willingness to pay of all households with problems (Yes, No)	problem most wanted eliminated
7	location of all responding households with problems (Mun, OC)	willingness to pay (Yes, No)
8	county (Haakon, Grant, Brookings)	willingness to pay of households with problems (Yes, No)
9	location of responding households in Haakon County (Mun, OC)	willingness to pay of Haakon County households with problems (Yes, No)
10	location of responding households in Grant County (Mun, OC)	willingness to pay of Grant County households with problems (Yes, No)
11	location of responding households in Brookings County (Mun, OC)	willingness to pay of Brookings County households with problems (Yes, No)

TABLE C-2. COMPUTED P-LEVELS OF THE CHI SQUARE TESTS

Service	Hypothesis of Independence ^a										
	1	2	3	4	5	6	7	8	9	10	11
Household Water	.0014**	.0639	.2450	.0305*	.2251	.0539	.8596	.2151	.5847	.7208	.4659
Sewage Disposal	.2987	.0970	.0759	.1457	.7104	.6990	.9443	.9213	.6267	.9806	.6987
Solid Waste Management	.0481*	.0738	.0687	.4357	.4223	.4929	.1547	.4480	.6615	.7254	.0913
Fire Protection	.0199*	.0569	.2683	.0083**	.2853	.2270	.4423	.6118	.3333	.2311	.3394
Law Enforcement	.5288	.4835	.5137	.7681	.2194	.6343	.7489	.2624	.6997	.1615	.4041
Education	.5276	.0257	.1470	.0507	.4668	.0000**	.5542	.5763	.3368	.7018	.8280
Health Care	.3987	.0877	.6640	.1118	.0154*	.1394	.8036	.4253	.5944	.0578	.3943

^aThe various hypotheses which were tested are shown in Table C-1.

*The hypothesis of independence of categorization is rejected at the 5.0 percent level.

**The hypothesis of independence of categorization is rejected at the 1.0 percent level.

APPENDIX D

APPENDIX D

SURVEY QUESTIONNAIRE

2

(7) What other sources of water are available to you? (Check

one or more)

_____	Municipal system
_____	Rural water district
_____	Private system
_____	Private well
_____	Other (specify) _____
_____	None (Go to Question 4)

(8) Why don't you use the other source(s) available to you?

(Check one or more)

_____	Too expensive
_____	Too time consuming
_____	Poor quality
_____	Treatment source is adequate
_____	Other (specify) _____

(9) On the average, what is your monthly cost for household water? (Enter dollar amount)

_____	Operating expense or monthly bill
_____	Depreciation of investment in the well, water system, etc.
_____	Total estimated cost without specifying operating and depreciation costs
_____	No estimate

(5) Within the last three years, what has been the most frequent problem with your water supply?

1

Interview Schedule

ASSESSMENT OF COMMUNITY SERVICES

_____ Schedule number

_____ Sample call number

_____ Interviewer number

_____ Location

_____ Open county

_____ Town (specify) _____

_____ County (specify) _____

_____ State (specify) South Dakota

Person interviewed:

_____ 1 Male head of household

_____ 2 Female head of household

_____ 3 Wife of male head of household

_____ 4 Other (specify) _____

Key: I have your telephone number in case I need to contact you again regarding this interview?

Interviewer comments:

We will start this interview with a series of questions about your water supply.

1. SOURCE

(1) Which of the following is your primary source of household water? (Check one)

_____	1 Municipal system
_____	2 Rural water district
_____	3 Private system
_____	4 Private well
_____	5 Other (specify) _____
_____	6 None

- (6) Have you had any of these specific problems within the past three years? (Include the problem mentioned in Question 5, if any). (Check one or more).

<input type="checkbox"/>	01 Hardness
<input type="checkbox"/>	02 Off color or odor
<input type="checkbox"/>	03 Undesirable odor
<input type="checkbox"/>	04 Iron
<input type="checkbox"/>	05 Bacterial contamination
<input type="checkbox"/>	06 Too much salt or other minerals
<input type="checkbox"/>	07 Unpleasant or undesirable taste
<input type="checkbox"/>	08 System failures
<input type="checkbox"/>	09 Inadequate or unreliable supply
<input type="checkbox"/>	10 Slow repair or maintenance service
<input type="checkbox"/>	11 Unreliable repair or maintenance
<input type="checkbox"/>	12 Other _____
<input type="checkbox"/>	13 None (Go to Question 12)

- (7) Which problem would you most like to see eliminated?
 ___ Enter a number from question 6.
- (8) Would you be willing to pay an additional amount above your present cost to eliminate that problem? (Check one)
- ___ 1 Yes
 ___ 2 No (Go to Question 12)
- (9) Would eliminating that problem require a major financial investment in equipment, buildings or facilities? (Check one)
- ___ 1 Yes
 ___ 2 No (Go to Question 12)
 ___ 3 Don't know (Go to Question 11)
- (10) What amount of financial investment would you be willing to make, and what would you buy or build with it?
 \$ _____ for investment in _____

- (11) How much would you be willing to pay monthly or yearly to eliminate that problem? (Check one)
- ___ 1 Less than \$5 per month (less than \$60 per year)
 ___ 2 \$5 to \$10 per month (\$60 to \$120 per year)
 ___ 3 More than \$10 per month (more than \$120 per year)
 ___ 4 No estimate
- (12) Are you aware of any way in which your water supply does not meet health or quality standards? (Check one)
- ___ 1 Yes
 ___ 2 No (Go to Question 14)
- (13) (If yes) In what way does it not meet health or quality standards?

- (14) Are you getting your money's worth from what you spend on water? (Check one)
- ___ 1 Yes
 ___ 2 No
 ___ 3 Don't know

II. SEWAGE DISPOSAL SYSTEM

- (15) Are you on a municipal sewage disposal system? (Check one)
- ___ 1 Yes
 ___ 2 No (Go to Question 17)
- (16) (If yes) Which of the following describes the method of sewage treatment and disposal? (Check one)
- ___ 1 Lagoon
 ___ 2 Treatment plant
 ___ 3 Other (specify) _____
- (17) (If no) Which of the following describes your method of sewage treatment and disposal? (Check one)
- ___ 1 Septic tank
 ___ 2 Cess pool
 ___ 3 Private lagoon
 ___ 4 Other (specify) _____

(16) On the average what is your monthly cost for using this sewage system? (Enter dollar amount)

_____ Operation, repair or monthly bill

_____ Repayment of investment in septic tank, septic lines, etc.

_____ Total estimated monthly cost without specifying operating or depreciation costs.

_____ Do estimate

(17) Within the last three years, what has been the most important problem with your sewage system? _____

(18) Again within the last three years, have you had any of these specific problems with your sewage system? (Include the problem mentioned in Question 17, if any). (Check one or more)

- | | |
|---|------------------------------------------------------|
| 1 | Odor |
| 2 | Pipe breaks |
| 3 | Blockage of drain pipes |
| 4 | Inadequate system capacity to dispose of your sewage |
| 5 | Slow repair or maintenance services |
| 6 | Unreliable repair or maintenance services |
| 7 | Overloaded septic tank/drainfield |
| 8 | None (Go to Question 20) |
| 9 | Other (Specify) _____ |

(19) Which problem would you most like to see eliminated? _____

_____ Enter a number from Question 20.

(20) Would you be willing to pay an additional amount above your present cost to eliminate this problem? (Check one)

_____ 1 Yes

_____ 2 No (Go to Question 24)

(21) Would eliminating this problem require a major financial investment in equipment, buildings or facilities? (Check one)

_____ 1 Yes

_____ 2 No (Go to Question 25)

_____ 3 Don't know (Go to Question 25)

(22) What amount of financial investment would you be willing to make, and what would you pay or build with it?

_____ for an investment in _____

(23) How much would you be willing to pay monthly or yearly to eliminate that problem? (Check one)

_____ 1 Less than \$5 per month (less than \$60 per year)

_____ 2 \$5 to \$10 per month (\$60 to \$120 per year)

_____ 3 More than \$10 per month (more than \$120 per year)

_____ 4 Do estimate

(24) Are you aware of any way in which your sewage disposal system does not meet health, sanitary or environmental standards? (Check one)

_____ 1 Yes

_____ 2 No (Go to Question 27)

(25) (If yes) In what way? _____

(26) Are you getting your money's worth from what you spend on sewage disposal? (Check one)

_____ 1 Yes

_____ 2 No

_____ 3 Don't know

III. SOLID WASTE DISPOSAL (SOLID WASTE DISPOSAL)

(27) Which of the following describes your primary method of solid waste disposal? (Check one)

_____ 1 Municipal collection (Go to Question 34)

_____ 2 Commercial collection (Go to Question 34)

_____ 3 You haul your own

(19) If you haul your own, do you haul solid wastes to a:

(check one)

- ___ 1. Municipal landfill
- ___ 2. Private landfill
- ___ 3. County landfill
- ___ 4. Municipal open dump
- ___ 5. County open dump
- ___ 6. Private open dump
- ___ 7. Other (please specify) _____

(21) How frequently do you haul your solid wastes? (fill in one)

- ___ times per month.
- ___ times per year.

(22) How far do you travel each trip? (fill in one)

- ___ blocks.
- ___ miles.

(23) What do you estimate are your costs per trip?

\$ _____ per trip. (including time, depreciation and gas costs, etc.)

(24) What is your average monthly or yearly cost for solid waste disposal? (fill in one)

- \$ _____/month
- \$ _____/year.

(25) You have indicated your primary waste disposal method, what other means of solid waste disposal are available? (check one or more)

- Municipal collection
- Commercial collection

You could haul your own to:

- Municipal landfill
- Private landfill
- County landfill
- County open dump
- Private open dump
- Other (please specify) _____

None. (Go to Question 32)

(26) Why don't you use these other means of solid waste disposal?

(check one or more)

- Too expensive.
- Too time consuming.
- Poor quality service.
- Too distant.
- Pickup not frequent enough.
- Other (specify) _____

(27) Within the last three years, what has been the most important problem with your solid waste disposal system?

(28) Have you had any of the following problems with solid waste disposal? (include the problems mentioned in Question 27, if any). (check one or more).

- 1. Other.
- 2. Blowing refuse.
- 3. Flew.
- 4. Rats.
- 5. Pits or other animals in your garbage cans.
- 6. Frequency of collection.
- 7. Slippy pickup causing spilled garbage.
- 8. Other _____
- 9. None (Go to Question 41)

(29) Of the problems you mentioned, which would you most like to see eliminated?

___ Enter number from (28)

(30) Would you be willing to pay an additional amount above your present cost to eliminate that problem? (check one)

- ___ 1. Yes
- ___ 2. No (Go to Question 44)

- (41) Would eliminating that problem require a major financial investment in equipment, building, or facilities? (Check one)
- ___ 1 Yes
- ___ 2 No (Go to Question 43)
- ___ 3 Don't know (Go to Question 43)
- (42) What amount of financial investment would you be willing to make and what would you buy or build with it?
- \$ _____ for an investment in _____
-
- (43) How much would you be willing to pay monthly or yearly to eliminate that problem? (Check one)
- ___ 1 Less than \$5 per month (less than \$50 per year)
- ___ 2 \$5 to \$10 per month (\$50 to \$120 per year)
- ___ 3 More than \$10 per month (more than \$120 per year)
- ___ 4 No estimate
- (44) Are you aware of any way in which your method of solid waste disposal does not meet health or sanitary standards? (Check one)
- ___ 1 Yes
- ___ 2 No
- (45) (If yes) In what way? _____
-
- (46) Are you getting your money's worth from what you spend on solid waste disposal? (Check one)
- ___ 1 Yes
- ___ 2 No
- ___ 3 Don't know

W. FIRE PROTECTION

- (47) What is your principal source of fire protection? (Check one)
- ___ 1 Municipal fire department.
- ___ 2 Rural fire department.
- ___ 3 Combined municipal and rural fire department.
- ___ 4 Informal neighborhood group (organized, but not a fire department).
- ___ 5 Personal efforts and/or assistance by neighbors.
- ___ 6 Other _____
- (48) How is your fire protection service financed? (Check one or more)
- ___ Taxation.
- ___ Special fees.
- ___ Donation or other fund-raising activities.
- ___ Other (specify) _____
- (49) During the past 3 years, have you called or had need to call any fire department for any reason other than fire protection? (Check one)
- ___ 1 Yes
- ___ 2 No (Go to Question 51)
- (50) (If yes). For what reason did you call the fire department? _____
-
- (51) Did they respond? (Check one)
- ___ 1 Yes
- ___ 2 No (Go to Question 53)
- (52) (If yes) How long did they take to respond? (Fill in one)
- ___ minutes.
- ___ hours.
- (53) During the past three years, have you had a fire you needed help to put out? (Check one)
- ___ 1 Yes
- ___ 2 No (Go to Question 59)

(54) When did you call for help? (Check one or more)

- Municipal fire department. (Go to Question 56)
- Rural fire department. (Go to Question 56)
- Combined municipal and rural fire department. (Go to Question 56)
- Informal neighborhood group. (Go to Question 56)
- Other _____ (Go to Question 55)
- No one.

(55) Why didn't you call the fire department? (Go to Question 55)

(56) (If you did call the fire department): Did the fire department respond? (Check one)

- 1 Yes
- 2 No. (Go to Question 55)

(57) (If yes) How long did they take to arrive? (Fill in one)

- minutes
- hours.

(58) What was the amount of fire loss?

_____ Dollars.

(59) What is the most important problem with your fire protection?

(60) Within the last 3 years, have you had any of these specific problems? (Include the problem mentioned in Question 59, if any) (Check one or more)

- Poor organization. (1)
- Insufficient water supply. (2)
- Faulty equipment. (3)
- No fast way to report fires. (4)
- Slow response. (5)
- Other (specify) (6) _____
- None. (Go to Question 60) (7)

(61) Which of these problems would you most like to see eliminated?

_____ Enter number from Question 60.

(62) Would you be willing to pay an additional amount above your present cost to eliminate that problem? (Check one)

- 1 Yes
- 2 No. (Go to Question 60)

(63) Would eliminating that problem require a major financial investment in equipment, buildings or facilities? (Check one)

- 1 Yes
- 2 No. (Go to Question 55)
- 3 Don't know. (Go to Question 60)

(64) What amount of financial investment would you be willing to make, and what would you buy or build with it?

\$ _____ for an investment in _____

(65) How much would you be willing to pay monthly or yearly to eliminate that problem? (Check one)

- 1 Less than \$5 per month (less than \$60 per year)
- 2 \$5 to \$10 per month (\$60 to \$120 per year)
- 3 More than \$10 per month (more than \$120 per year)
- 4 No estimate

(66) Are you getting your money's worth from what you spend on your fire protection service? (Check one)

- 1 Yes
- 2 No
- 3 Don't know

V. LAW ENFORCEMENT

(7) What type of law enforcement services are available in your

(Check one or more as appropriate)

- Highway patrol. (1)
 Municipal police. (2)
 Sheriff's department. (3)
 Private security services. (4)
 Other. (5) _____

(8) Do law enforcement officers make a regular patrol past your property? (Check one)

- 1 Yes
 2 No

(9) Are they available on call? (Check one)

- 1 Yes
 2 No

(10) What is the distance to the nearest office having responsibility for law enforcement in your area? (Fill in one)

- miles.
 blocks.

(11) Have you called for law enforcement assistance for any

reason during the past three years? (Check one)

- 1 Yes
 2 No (Go to Question 19)

(12) (If yes) Why did you call?

(13) When did you call?

Enter number from Question 67.

(14) How long did it take to contact them?

_____ minutes.

(15) After the first request, how long did it take them to

render assistance? (Fill in one)

- minutes.
 hours.
 days.

(16) Does your estimate tally with the actual amount you actually paid? (Check one)

- 1 Yes
 2 No

(17) Why?

(18) Are you aware of any law enforcement problems in this area?

1. _____
 2. _____
 3. _____

 4. None (Go to Question 65)

(19) Which one of these problems would you most like to see eliminated?

(20) Would you be willing to pay an additional amount above your present cost to eliminate that problem? (Check one)

- 1 Yes
 2 No (Go to Question 24)

(21) Would eliminating that problem require a major financial investment in equipment, buildings or facilities? (Check one)

- 1 Yes
 2 No (Go to Question 23)
 3 Don't know (Go to Question 63).

(22) What amount of financial investment would you be willing to make, and what would you buy or build with it?

\$ _____ for an investment in _____

(23) How much would you be willing to pay monthly or yearly to eliminate that problem? (Check one)

- 1 Less than \$5 per month (Less than \$60 per year)
 2 \$5 to \$10 per month (\$60 to \$120 per year)
 3 More than \$10 per month (More than \$120 per year)
 4 No estimate

(4) Are you putting your money's worth from what you spend on law enforcement? (Check one)

- _____ 1 Yes
- _____ 2 No
- _____ 3 Don't know

VI. EDUCATION

(5) Is anyone in your family currently enrolled in some type of schooling? (Check one)

- _____ 1 Yes
- _____ 2 No (Go to question 94)

(6) If yes, how many are enrolled in each of the following types of schooling? (Enter number enrolled)

- _____ Nursery school
- _____ Kindergarten
- _____ Elementary
- _____ Junior High
- _____ Senior High
- _____ Junior College
- _____ 4 year College or University
- _____ Adult Vocational Education
- _____ Vocational or Technical School
- _____ Special Education (Specify) _____
- _____ _____
- _____ _____

(7) Is a private auto used for transporting one or more family members to school, classroom instruction and/or extracurricular activities? (Check one)

- _____ 1 Yes
- _____ 2 No (Go to Question 82)

(8) If you would like to know the travel cost associated with each type of activity:

First, consider the cost of your travel for classroom activities.

8A. How many trips are made each week for each type of schooling? (Column A)

8B. What is the total number of weeks of this travel each year? (Column B)

8C. What is the total number of weeks of this travel each year? (Column C)

Second, consider the costs of auto travel for extracurricular activities.

8D. How many trips are made each week for each type of schooling? (Column D)

8E. What is the total number of weeks of this travel each year? (Column E)

8F. What is the total number of weeks of travel per year? (Column F)

Type of Schooling	Travel for Classroom			Travel for Extracurricular		
	A	B	C	D	E	F
Nursery School	---	---	---	---	---	---
Kindergarten	---	---	---	---	---	---
Elementary	---	---	---	---	---	---
Junior High	---	---	---	---	---	---
Senior High	---	---	---	---	---	---
Junior College	---	---	---	---	---	---
4 year College or University	---	---	---	---	---	---
Adult Voc.	---	---	---	---	---	---
Voc. or Tech.	---	---	---	---	---	---
Special Educ.	---	---	---	---	---	---

(9) Is there any other transportation cost incurred by family members as a result of their attendance for school classroom instruction? (Check one)

- _____ 1 Yes
- _____ 2 No (Go to Question 21)

- (17) (If yes) What is the average weekly cost of this student protection cost? (Fill in with blank)
- Dollars per week per -----
 ----- Dollars per year -----
- (18) Do you pay tuition and/or fees for household members enrolled in school classes instruction? (Check one)
- 1 Yes -----
 ----- 2 No (Go to Question 92) -----
- (19) (If yes) We would like to know the cost of tuition and fees paid by or for members of this household.

92a. For how many family members are tuition and/or fees paid in order to attend each type of schooling? (Column A)

92b. What is the yearly tuition per student? (Column B)

92c. What are the yearly fees per student? (Column C) OR
 What is the combined total of tuition and fees per student? (Column D)

	A	B	C	D
	No. Paying Tuition and/or Fees	Yearly Tuition	Yearly Fees	Combined Yearly Tuition and Fees
Primary School	-----	-----	-----	-----
Kindergarten	-----	-----	-----	-----
Primary	-----	-----	-----	-----
Junior High	-----	-----	-----	-----
Senior High	-----	-----	-----	-----
Junior College	-----	-----	-----	-----
College	-----	-----	-----	-----
Adult Ed.	-----	-----	-----	-----
Voc or Tech.	-----	-----	-----	-----
Special Education	-----	-----	-----	-----
Specify	-----	-----	-----	-----
-----	-----	-----	-----	-----
-----	-----	-----	-----	-----
-----	-----	-----	-----	-----

- (20) What other in-state costs do you pay for education? (Please indicate each in terms of amount paid yearly.)
- \$/Year
- Food -----
 ----- Lodging -----
 ----- Books and Supplies -----
 ----- Special Equipment -----
 ----- Individual Instruction, or tutoring -----
 ----- Other -----
 ----- Total per year -----
- (21) In your opinion, what is currently the most important problem with education? -----

- (22) During the past three years, have you had any of these specific problems? (Include the problem mentioned in Question 96, if any). (Check one or more)
- | | |
|------------------------------------------|-------|
| 1 High costs (tuition). | ----- |
| 2 Lack of special courses. | ----- |
| 3 Schools are too small. | ----- |
| 4 Schools are too big. | ----- |
| 5 Schools do not teach the right things. | ----- |
| 6 Inadequate instructional equipment. | ----- |
| 7 Other (specify) ----- | ----- |
| 8 None. (Go to Question 101) | ----- |

- (23) Which problem would you most like to see eliminated? Enter number from Question 95. -----
- (24) Would you be willing to pay an additional amount above your present cost to eliminate that problem? (Check one)
- 1 Yes -----
 ----- 2 No (Go to Question 101) -----
- (25) Would eliminating that problem require a major financial investment in equipment, building or facilities? (Check one)
- 1 Yes -----
 ----- 2 No (Go to Question 101) -----
 ----- 3 Don't know (Go to Question 101) -----

(99) How amount of financial investment would you be willing to make, and over what period of time, for an investment in _____

(100) How much would you be willing to pay monthly or yearly to eliminate that problem? (check one)

- _____ 1 Less than \$5 per month (less than \$60 per year)
- _____ 2 \$5 to \$10 per month (\$60 to \$120 per year)
- _____ 3 More than \$10 per month (more than \$120 per year)
- _____ 4 No estimate

(101) Are you getting your money's worth from what you spend on education? (check one)

- _____ 1 Yes
- _____ 2 No
- _____ 3 Don't know

VII. HEALTH

(102) As a part of this section to have several interrelated questions about health services.

- a. What is the distance to the nearest place for securing the services of:
 - b. Which of these health services have you or members of your household contacted during the past year? (estimate if not certain)
- For those services contacted in the past year by members of your household:
- c. How much time does it take to travel to each?
- d. What distance was traveled to secure each of these services?
- e. How many times did you and members of your family contact each of these health services during the past year?

Health Service	Distance to nearest place	Number contacted	Time for trip (hours)	Distance traveled (miles)	No. of times contacted	Cost of service (dollars)	Specialty	(Circle one)	
								1 - Yes	2 - No
01 General Physician	---	---	---	---	---	---	---	---	---
02 Special-ist (other specialty)	---	---	---	---	---	---	---	---	---
03 Hospital	---	---	---	---	---	---	---	---	---
04 Dispensary	---	---	---	---	---	---	---	---	---
05 Clinic-practitioner	---	---	---	---	---	---	---	---	---
06 Out-patient	---	---	---	---	---	---	---	---	---
07 First-aid	---	---	---	---	---	---	---	---	---
08 Practical Nurse	---	---	---	---	---	---	---	---	---
09 Public Health Nurse	---	---	---	---	---	---	---	---	---
10 Dentist	---	---	---	---	---	---	---	---	---
11 Optic-ian	---	---	---	---	---	---	---	---	---
12 Mental Health Consultant	---	---	---	---	---	---	---	---	---
13 Hospital	---	---	---	---	---	---	---	---	---
14 Ambulance Service	---	---	---	---	---	---	---	---	---

IF NO SERVICES IN CHECKED B, GO TO QUESTION 104.

(103) In order that we can estimate your non-medical costs of securing these health services, could you think back over the past year and, as best you can remember, provide the following information about each type of health service you have contacted:

- a. The number of visits you have purchased while away from home securing each type of health care (Column A).
- b. The number of nights of lodging you have paid for while away from home securing each type of health care (Column B).
- c. The number of days of pay you have lost while securing each type of health care. (Column C).
- d. The cost of any taxi, bus, train or airplane fares you have paid by type of health service contacted (Column D).
- e. Any other non-medical costs you have incurred (do not include the actual costs of the health care received).

Type of Health Service (Enter Number from Q. 102)	(Column E).				
	A.	B.	C.	D.	E.
Number of Visits Purchased	Number of Nights of Lodging	Number of Days of Pay Lost	Cost of Fares Purchased (Dollars)	Other Costs (Dollars)	
---	---	---	---	---	---
---	---	---	---	---	---
---	---	---	---	---	---
---	---	---	---	---	---
---	---	---	---	---	---
---	---	---	---	---	---
---	---	---	---	---	---
---	---	---	---	---	---
---	---	---	---	---	---
---	---	---	---	---	---

(104) During the past year, have you had any of the following problems with obtaining a health appointment?

<input type="checkbox"/>	1. Unable to obtain an appointment.
<input type="checkbox"/>	2. Had to wait too long for an appointment.
<input type="checkbox"/>	3. Had to wait too long in office.
<input type="checkbox"/>	4. Didn't have transportation.
<input type="checkbox"/>	5. Referred to another doctor and had to wait for an appointment.
<input type="checkbox"/>	6. Other (specify) _____

7. None (Go to Question 111)

(105) With which health services have you had these problems and how often have they occurred?

Health Service from List in Question 102	Problem From Question 104 Above (Circle number)	Frequency of Problems								
		1 - Always	2 - Sometimes	3 - Occasionally	4 - Never	5 - Don't know	6 - Other			
_____	_____	1	2	3	4	5	6	1	2	3
_____	_____	1	2	3	4	5	6	1	2	3
_____	_____	1	2	3	4	5	6	1	2	3
_____	_____	1	2	3	4	5	6	1	2	3

(106) Of all the problems you have discussed, which problem would you most like to see eliminated?

_____ Enter number from Question 104 and/or Question 105.

(107) Would you be willing to pay an additional amount above your present cost to eliminate this problem? (Check one)

_____ 1. Yes

_____ 2. No (Go to Question 111)

(108) Would eliminating this problem require a major financial investment in equipment, buildings or facilities? (Check one)

_____ 1. Yes

_____ 2. No (Go to Question 110)

_____ 3. Don't know (Go to Question 110)

(115) Do you think these organizations are effective in meeting needs or finding solutions to community problems of fire protection?

Organization number 1 from Question 117

1 Yes

2 No

Organization number 2 from Question 117

1 Yes

2 No

Organization number 3 from Question 117

1 Yes

2 No

(119) In your opinion, are these organizations of benefit to the community? (Check one)

Organization number 1 from Question 117

1 Of major benefit

2 Of minor benefit

3 Of no benefit

4 Should not exist

Organization number 2 from Question 117

1 Of major benefit

2 Of minor benefit

3 Of no benefit

4 Should not exist

Organization number 3 from Question 117

1 Of major benefit

2 Of minor benefit

3 Of no benefit

4 Should not exist

(120) Do you know of one or more volunteer organizations or groups in this county that are concerned with problems and needs of law enforcement?

1 Yes

2 No (Go to Question 124)

(121) Please name these organizations.

1. _____

2. _____

3. _____

(122) Do you think these organizations are effective in meeting needs or finding solutions to community problems of law enforcement?

Organization number 1 from Question 121

1 Yes

2 No

Organization number 2 from Question 121

1 Yes

2 No

Organization number 3 from Question 121

1 Yes

2 No

(123) In your opinion, are these organizations of benefit to the community? (Check one)

Organization number 1 from Question 121

1 Of major benefit

2 Of minor benefit

3 Of no benefit

4 Should not exist

Organization number 2 from Question 121

1 Of major benefit

2 Of minor benefit

3 Of no benefit

4 Should not exist

organization number 3 from Question 121

- 1 Of major benefit
 2 Of minor benefit
 3 Of no benefit
 4 Should not exist

(124) Do you know of one or more volunteer organizations or groups in this county that are concerned with problems and needs of education?

- 1 Yes
 2 No (Go to Question 125)

(125) Please name these organizations.

1. _____

 2. _____

 3. _____

(126) Do you think these organizations are effective in meeting needs or finding solutions to community problems of education?

Organization number 1 from Question 125

- 1 Yes
 2 No

Organization number 2 from Question 125

- 1 Yes
 2 No

Organization number 3 from Question 125

- 1 Yes
 2 No

(127) In your opinion, are these organizations of benefit to the community? (check one)

Organization number 1 from Question 125

- 1 Of major benefit
 2 Of minor benefit
 3 Of no benefit
 4 Should not exist

organization number 2 from Question 125

- 1 Of major benefit
 2 Of minor benefit
 3 Of no benefit
 4 Should not exist

Organization number 3 from Question 125

- 1 Of major benefit
 2 Of minor benefit
 3 Of no benefit
 4 Should not exist

(128) Do you know of one or more volunteer organizations or groups in this county that are concerned with problems and needs of health?

- 1 Yes
 2 No (Go to Question 129)

(129) Please name these organizations.

1. _____

 2. _____

 3. _____

(130) Do you think these organizations are effective in meeting needs or finding solutions to community problems of health?

Organization number 1 from Question 129

- 1 Yes
 2 No

Organization number 2 from Question 129

- 1 Yes
 2 No

Organization number 3 from Question 129

- 1 Yes
 2 No

(121) In your opinion, are there organizational benefits of benefits to the community? (Check one)

Organization number 1 from Question 120

- ___ 1 Of major benefit
- ___ 2 Of minor benefit
- ___ 3 Of no benefit
- ___ 4 Should not exist

Organization number 2 from Question 120

- ___ 1 Of major benefit
- ___ 2 Of minor benefit
- ___ 3 Of no benefit
- ___ 4 Should not exist

Organization number 3 from Question 120

- ___ 1 Of major benefit
- ___ 2 Of minor benefit
- ___ 3 Of no benefit
- ___ 4 Should not exist

(13) See final question card for the first name, sex, age, marital status and level of education of you and the other members of this household.

What is the first name of each? (Then fill in across the columns for each person.)

First name of adults with principal residence in this household:	A		B		C		D	
	First Name	Sex	Age	Marital Status	Education	Education	Education	Education
_____	1 2	_____	_____	_____	1 2 3 4	_____	_____	_____
_____	1 2	_____	_____	_____	1 2 3 4	_____	_____	_____
_____	1 2	_____	_____	_____	1 2 3 4	_____	_____	_____
_____	1 2	_____	_____	_____	1 2 3 4	_____	_____	_____
_____	1 2	_____	_____	_____	1 2 3 4	_____	_____	_____

First name of children with principal residence in this household:

_____	1 2	_____	_____	_____	1 2 3 4	_____	_____	_____
_____	1 2	_____	_____	_____	1 2 3 4	_____	_____	_____
_____	1 2	_____	_____	_____	1 2 3 4	_____	_____	_____
_____	1 2	_____	_____	_____	1 2 3 4	_____	_____	_____
_____	1 2	_____	_____	_____	1 2 3 4	_____	_____	_____

Key for Column C:

- 5 - Single
- H - Married
- W - Widower or Widower
- 0 - Other

Key for Column D:

- Level Highest Level of Education:
- 1 - Primary School
- 2 - High School
- 3 - High School Graduate
- 4 - Junior High
- 5 - Senior High
- 6 - Junior College
- 7 - College
- 8 - Adult Vocational Education
- 9 - Vocational or Technical Education
- 10 - Special Education

Thank you very much for your cooperation and assistance in completing this survey. Please do not give this information to anyone else. Your response will be kept confidential.