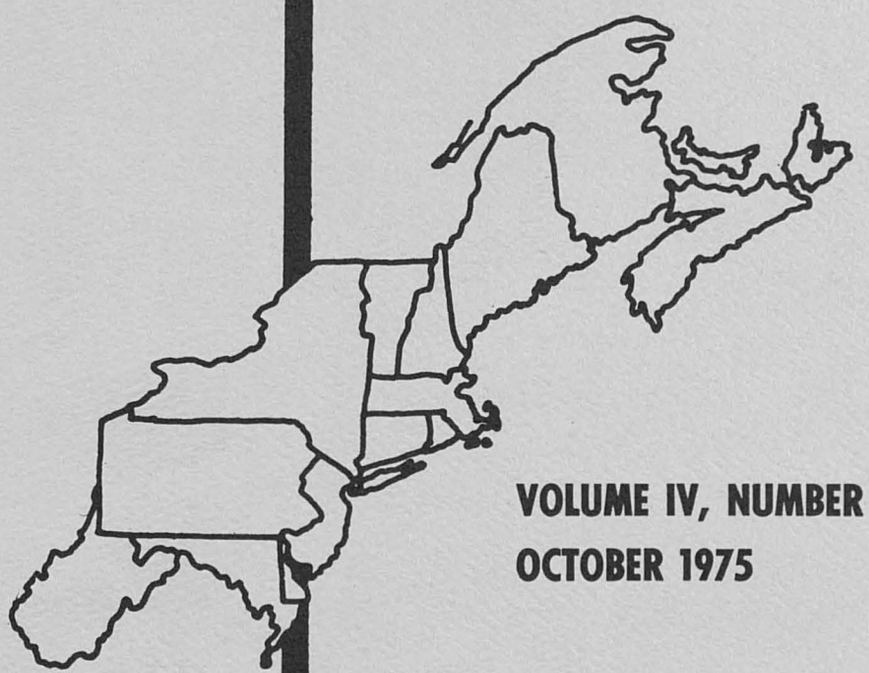
JOURNAL OF THE

Northeastern Agricultural Economics Council



VOLUME IV, NUMBER 2
OCTOBER 1975

HEALTH CARE CONTACT IN RURAL AREAS OF THE NORTHEAST: A PROGRESS REPORT*

Charles O. Crawford, Associate Professor
Department of Agricultural Economics & Rural Sociology
The Pennsylvania State University

Donn A. Derr, Associate Professor
Department of Agricultural Economics and Marketing
Rutgers University

Nelson LeRay, Economic Development Division
Economic Research Service
U.S. Dept. of Agriculture

Edmund F. Jansen, Jr., Associate Professor
Institute of Natural and Environmental Resources
University of New Hampshire

Introduction

Problems in the delivery of community services to rural areas have received increasing attention in recent years. 1/ One concern has centered on questions of use, availability, accessibility, satisfaction, and problems in use by consumers, while a second focus has been on provider

*The research this article is based on was conducted under Northeast Regional Research Project NE-77, "Community Services for Nonmetropolitan People in the Northeast", and New Jersey Agricultural Experiment Station Project Hatch 875, New Hampshire Agricultural Experiment Station Project Hatch 210 and Pennsylvania Agricultural Experiment Station Project Hatch 1914 and published as New Jersey Agricultural Experiment Station Journal Series Paper. The views presented herein are those of the authors and are not necessarily the views of the cooperating agencies.

1/ One indication of importance is the high priority given to research on community services in Rural Development Research in the Northeast for the Next Five Years -- A Framework, Task Force Report to the Northeastern Regional Agricultural Research Planning Committee (September 1973). Evidence of importance can also be found in a recent work on problems of declining rural communities (North Central Regional Center for Rural Development, Communities Left Behind, Ames: Iowa State University Press, 1974, esp. Chapter 7).

organization. 2/ A third important focus has been on the role of services in development of a community. Does service "mix" (amount of services provided in a community) have an effect on growth or decline of the community? Conversely, does growth or decline of the community have an effect on service mix? These are at least three more specific dimensions of the larger complex issue of service delivery for rural areas.

This paper examines some of the findings from Regional Project NE-77, a study of community services in nonmetropolitan areas of the northeastern United States. The purpose of the regional project was to look at selected aspects of the provision and use of services. 3/ Operationally, the focus was on four services in three types of community settings, with several sites selected within each setting. These four services were health, education, housing, and legal.

Analysis of service mix and delivery in terms of change in developmental status of an area would seem to have particular relevance in view of recent demographic "turn arounds" in some rural regions of the country.4/

This is a report on tri state analysis of one of these services; utilization of general practitioner medical service, and the problems experienced in the utilization. Cordes [1] has noted that health utilization studies have somewhat limited value unless they include an analysis of the extent to which health services were needed but not obtained. Both aspects are dealt with in this paper.

Data Collection Procedures

The general methodological design employed was cross-sectional. Two phases of data collection were employed. Data on services provided at the selected sites were collected in late 1973 and early 1974. Interviews with

---

2/ An example of a comprehensive discussion of services research from both consumer and provider standpoints can be found in a forthcoming book on health services for rural areas: L.R. Whiting and E.W. Hassinger (eds.), Rural Health Services: Organization, Delivery and Consumption Aspects (working title), Ames: Iowa State University Press.

3/ For a detailed statement of objectives and procedures used see: Methodological Considerations in Researching Community Services in the Northeast, Derr, Ploch, Sinclair (eds.), New Jersey Agricultural Experiment Station, Bulletin 836, July 1975.

4/ A discussion of demographic turnarounds is contained in Calvin L. Beale, "Rural Development: Population and Settlement Prospects", Journal of Soil and Water Conservation, January-February, 1974 (29 1), pp. 23-27.

a sample of service users (households) were conducted during the summer and early fall of 1974. This paper deals only with data from service users.

For the consumer phase of the project, a common "core" interview schedule was developed and used. The core interview schedule was designed to gather information on (1) "contact" with service, (2) satisfaction with service, (3) location of service, and (4) problems in using or obtaining service. These four dimensions were explored with the four services noted -- health, education, housing and legal, of which only health is reported here.

The variable derived for measuring household use of the general practitioner's services was a measure of "contact" rather than use in terms of number of visits for the two years preceding the interview. Contact is defined as a specific household member, using a specific type of physician, for a given primary reason (prevention or treatment), in a specific context (hospital, office, etc.) at a specific location. If all five of these items were constant over a period of several physician visits, one contact was recorded. Any time an additional visit was cited by the respondent for which any one of these five components of contact was different from an already cited visit, a new contact was recorded. It is believed this measure would provide an indication of what the researchers were seeking -- a measure of contact with the health care system, or the extent to which a household had different encounters with the health care system.

For data standardization, instructions were developed for use in training interviewers at participating agricultural experiment stations. After all the interviews had been completed at a given station, the schedules were checked for accuracy and consistency. Once checking was completed, the researcher sent approximately 20 completed and checked schedules to a central data processing station for further evaluative editing. Any further questions on data preparation from this editing were resolved and the remainder of the completed schedules for that state were admitted for final processing.

Sampling

The study was confined to those counties in ten northeastern states which had at least 30 percent of their population living outside urbanized areas in 1970. For the Northeast, 245 counties met this criterion. Sampling was handled in two stages. The first stage dealt with classifying counties by changes in population and median family income between 1960 and 1970. The 245 eligible counties were ranked separately from high to low for income and population change. Each array was divided into quintiles and in order to include a broad cross-section of communities in the sample, counties that were located in the upper, middle and lower quintiles for both arrays (population and income) were identified. Thus, the high growth counties in the finally selected stratum were in the

upper quintile on both measures. They had grown more rapidly in terms of population and income from 1960 to 1970 than the average. Those counties in the lowest stratum lost population and had a smaller income increase than the average. The middle stratum (3rd quintile) tended to reflect what was typically, or "on the average," happening in the region with regard to population and income change. Researchers within individual states selected the site counties for their state from among those so identified.

After the site counties had been selected from the categories above, the New England states and New Jersey delineated smaller areas for study since in these states the political entity which provided directly or was responsible for decisions about providing public services is the minor civil division (MCD). In the states where the MCD was identified as the control unit, element sampling was done with MCD's. In the other states, the county was the unit from which samples were drawn. A random area sample design was used in each control unit.

For the six "communities" included in this report one is a township in New Jersey, three are clusters of adjacent towns in New Hampshire, and two are counties in Pennsylvania. 5/ The New Jersey township has grown rapidly both in population and median family income in recent years and has experienced extensive socio economic changes. It has changed from a predominantly dairy area to a recreation area, including two ski slopes and other commercial recreation facilities. In addition, there are a number of summer homes occupied by people in the upper income group.

In New Hampshire, one group of towns reflects a manufacturing base, another a recreational base, and a third an agricultural base. One of these town clusters (recreational) was considered stable while the other two (manufacturing and agriculture) were classified as declining.

Both Pennsylvania counties had population losses between 1960-1970 and were classified as declining economically. Both counties rely on agriculture and manufacturing for their economic base.

Household Characteristics

The characteristics used in describing households are those to be used in the analysis of contacts by sites -- length of residence, household income in 1974, and age and education of household head.

5/ It is the intent of the researchers on the project to utilize data from all sites in the regional analysis. The six sites reported on are those for which data were available at the writing of this paper. Other sites will be added to the analysis as additional data become available.

The characteristic on which the sites differed most was length of residence. 6/ It will be noted in Table 1 that site 1 (higher population growth) had a higher percentage of "newcomers" and a lower percentage of oldtimers when compared to sites 2-6 (stable and declining in population growth). 7/ Sites differed significantly on household income and education of household head (Table 2). Sites did not differ significantly by age of household head. Although the detailed data are not presented here, it is worth stating that, in general, the sites with the higher rates of growth have households with higher incomes and household heads that are younger and more educated. With regard to education, the two higher growth sites, when compared to the four lower growth sites, had lower percentages of heads of households with less than 12 years of school and higher percentages of heads with more than 12 years of school. Although most were statistically significant at the 5 percent level, analyses by age revealed that lower growth sites had heads of households who were older than those in the higher growth sites.

Table 1
Percentage Distribution of Households by Length of Residence in Community, Six Sites

Length of residence (years)	Site					
	1	2	3	4	5	6
	(percent)					
Less than 5	34.5	19.4	19.0	2.0	4.0	9.0
5 - 19	48.2	31.3	24.0	6.0	25.0	18.9
20 or more	17.3	49.3	57.0	92.0	71.0	72.1
Total	100.0	100.0	100.0	100.0	100.0	100.0
N (sample size)	139	67	100	99	100	201

X^2 (Computed on number of cases) = 177.3, d.f. = 10, $p = <.001$
No information for 3 cases

6/ Throughout this paper, the probability level used for statistical significance is .05.

7/ In Tables 1 and 3-6, those giving data by sites, the sites are arrayed in terms of growth or developmental status with site 1 having high growth, site 2 being somewhat stable, and sites 3-6 having much lower rates of growth. Site 1 is in New Jersey; 2, New Hampshire recreational; 3, New Hampshire manufacturing; 4, New Hampshire agricultural; and 5 and 6, Pennsylvania manufacturing and agricultural, respectively.

Table 2
Summary of Chi-Square Values, Degrees of Freedom, Associated Probabilities and Number of Cases of No Information Associated with Distribution of Households by Site and Household Income (1974) and Education and Age of Household Head

Statistical item	Characteristics		
	Household income	Education of household head	Age of household head
X^2	60.6	54.8	22.0
d.f.	15	10	15
p	$<.001$	$<.001$	$>.05$
Cases of no information	80	15	6

Contacts by Households with General Practitioner

Contacts with general practitioners, along with problems in obtaining this service, are the two major foci of this paper. These contacts are to be examined in terms of developmental status of site (relative rates of growth) and the four variables of length of residence, household income, education and age of household head. Included in visits to general practitioners were visits to internists, pediatricians and obstetricians as well as visits to general practitioners per se.

To test for statistical significance among sites with regard to physician contact, analysis of variance was employed using the "ANOVES" computer program. Tables 3-6 present actual mean contacts per household while the F ratios given in the tables are based on transformed scores. 8/

As will be noted in Tables 3-6, the F ratios are statistically significant for the relationship between sites and length of residence, income, years of school completed by head of household and age of household head. The chance probabilities of the F ratios are less than .001. It can also be noted in the tables that the highest growth site (site 1) had the lowest mean contact level.

8/ First analysis revealed lack of homogeneity of variance. A transformation of scores from X to $\sqrt{X}$ was made and homogeneity was increased substantially.

Since in the earlier section on household characteristics it was found that the sites differed significantly by length of residence, income, and education of household head, these variables may be giving rise to site variations in mean contact scores. These possible effects are discussed below.

Considering contacts by length of residence, the data in Table 3 indicate a general pattern in which longer term residents (20 years or more) had mean contact scores lower than did the more recent residents (less than 5 years). The only exception to this general pattern is that found in site 3, where longer term residents had higher contact than shorter term residents. The F ratio for length of residence was significant at the .05 level ($p = .035$). Since length of residence does have an effect on contact, and since sites were found to differ significantly by length of residence, it is clear this variable must be considered in interpreting site differences.

Table 3
Mean Number of Physician Contacts with Households, by Sites and Categories of Length of Residence

Length of residence (years)	Site					
	1	2	3	4	5	6
Less than 5	.73	1.05	.85	1.00	1.70	1.30
5 - 19	.74	.88	1.05	1.05	1.40	1.16
20 or more	.52	.93	1.12	.71	1.19	1.12
Site Mean	.70	.94	1.05	.73	1.27	1.14
N (sample size)	139	67	100	99	100	201

Site: $F = 12.27$, d.f. = 5, $p = <.001$
Length of residence: $F = 3.37$, d.f. = 2, $p = .035$
Interactions: $F = 1.141$, d.f. = 10, $p = .329$
No information for 3 cases.

Table 4 presents data on distribution of mean physician contact with households by site and household income. Although site differences are statistically significant, those for income are not. As might be expected, in view of the high chance probability of differences by income ($p = .576$), there are no identifiable patterns by income category. Researchers in recent years have pointed to a diminution of the relationship of income to use of health services and the need to consider method and source of payment. [2,4]

Table 4
Mean Number of Physician Contacts with Households,
by Sites and Categories of Household Income (1974)

Income	Site					
	1	2	3	4	5	6
Less than $5,000	.85	.82	.70	.94	1.10	1.35
5,000 - 7,999	.46	1.14	1.03	.98	1.51	1.03
8,000 - 11,999	.76	.98	.66	1.09	1.22	1.11
12,000 or more	.69	.91	.62	1.23	1.15	1.02
Site Mean	.70	.94	.70	1.05	1.24	1.13
N (sample size)	124	62	87	99	89	168

Site: $F = 10.387$, d.f. = 5, $p = <.001$
Income: $F = .662$, d.f. = 3, $p = .576$
Interaction: $F = 1.224$, d.f. = 15, $p = .248$
No information for 80 cases.

In Table 5, it will be noted that the F ratio for education is not significant ($p = .324$). No general pattern is observable except there is a slight tendency for households with more educated heads in sites 1 - 4 to have higher mean contacts.

The fourth variable by which contacts are examined along with sites was age of household head. As the data in Table 6 show, the pattern was for households with younger heads (less than 40 years) and those with older heads (70 or more years) to have higher mean contact scores than households with middle-aged heads (40 to 49 years of age). This partially supports the general finding that older families tend to use health services more than middle-aged families. 9/ The F ratio for age is significant beyond the .001 level which indicates that the age of the household head influences the mean number of contacts made by households. This, together with the earlier finding that sites differed somewhat by age, suggests that age must be examined when site differences are discussed.

9/ McKinlay [3] cites several studies which he states show the general pattern of increased utilization by individuals with increases in age. On a family basis, this would most likely mean that younger families with children, and older families, would have higher use per person per family than middle-aged families where children have left home.

Table 5
Mean Number of Physician Contacts by Sites and Categories of Education of Household Heads

Years of school completed	Site					
	1	2	3	4	5	6
Less than 12	.66	.87	.98	.61	.97	1.23
12	.63	.76	1.06	.75	1.49	1.03
More than 12	.80	1.21	1.18	1.01	1.16	1.18
Site Mean	.70	.94	1.05	.73	1.26	1.15
N (sample size)	139	67	99	97	97	195

Site: F = 11.597, d.f. = 5, p = <.001
Education: F = 1.129, d.f. = 2, p = .324
Interaction: F = 1.800, d.f. = 10, p = .057
No information for 15 cases

Table 6
Mean Number of Physician Contacts by Sites and Categories of Age of Household Head

Age (in years)	Site					
	1	2	3	4	5	6
Less than 40	.74	1.22	1.19	.92	1.51	1.12
40 - 49	.57	.58	.95	.51	1.08	1.03
50 - 69	.74	.91	.93	.60	1.09	1.06
70 or more	.83	.87	1.12	.96	1.36	1.47
Site Mean	.70	.94	1.05	.73	1.27	1.15
N (sample size)	138	67	100	99	100	199

Site: F = 12.132, d.f. = 5, p = <.001
Age: F = 9.659, d.f. = 3, p = <.001
Interaction: F = 1.121, d.f. = 15, p = .333
No information for 6 cases.

The F value for interaction between site and age is not significant indicating that site and age taken together do not have an effect on the mean number of contacts made by households in the six sites.

Unavailability of General Practitioner Service

Respondents were asked whether there were times in the two years preceding the interview when a physician was needed but could not be obtained. Results of the analysis to this question are given in Table 7. For three of the sites (including the expanding and stable sites) the percentages of respondents indicating an unmet need were small. It is interesting to note that site 4 is in close proximity to four hospitals. However, for three of the four declining sites, the percentages exceeded 10 percent and in site 5, it approached 20 percent of all respondents. If one assumes that many of these families had learned to adjust to some degree of problems of unmet physician needs, and tried to get a physician only when the need was perceived as rather great, then these percentages are most likely conservative.

In terms of specific types of problems encountered, inability to get an appointment and unavailability of physicians were the most frequently mentioned.

Summary

This paper reports on an analysis of household contacts with physicians among households in six "communities" in three states which had different rates in population and median family income growth from 1960 to 1970. Problems encountered in seeking use of a physician service were also explored.

The research reported here is part of a larger regional project dealing with analysis of consumer use of services in seventeen sites across the Northeast which were selected as representing differing developmental or growth settings.

A measure of "contact" with a physician (not necessarily a measure of "use") was employed in the study. Analysis of variance revealed high F ratios for differences among site mean contact levels. The F ratios were significant beyond the .001 level of significance. Lower growth sites had higher contact rates than did higher growth rate sites. The F ratios for length of residence and age of household head were also found to be significant. These latter findings deserve attention as sites were found to differ considerably by length of residence and some by age of household head.

Households in the lowest growth sites reported facing the problem of not being able to obtain services of a physician substantially more often than those in the higher growth sites.

Table 7
Number and Percentage Distribution of Households According to Whether There Were Times When a General Practitioner was Needed but Could Not Be Obtained during the Two-Year Period Preceding Interview, Six Sites

Instances of unmet needs	Site					
	1	2	3	4	5	6
	(Number of households)					
None	136	62	85	99	83	172
One or more	4	2	11	0	17	29
Reasons						
Could not get appointment	1	--	4	--	7	15
Cost too much	--	--	--	--	1	1
No transportation	--	--	--	--	1	4
No time	--	--	--	--	--	1
Not available	3	2	2	--	4	3
Other	--	--	5	--	4	5
	(Percent of households)					
Indicating one or more	2.9	3.1	11.5	0	17.0	14.4
Total N =	140	64	96	99	100	201

No information for 9 cases.

Conclusions

The finding that sites with lower or declining growth rates had higher contacts with general practitioners than did sites with higher growth rates at first glance "flies in the face" of traditional views of lower use of services by households in such sites. However, further examination of characteristics of households within the sites, coupled with the effects of these characteristics on contact, conditions initial interpretation.

"Newcomers" had higher rates of contact than did "oldtimers". However, the higher contact sites (lower growth sites) had higher proportions of older residents. Thus, length of residence does not help explain site differences. Age, however, may help explain site differences. The younger and older households tended to have greater rates of contact than households with middle-aged heads. Since lower growth sites also tended to have higher proportions of older persons, there would be some tendency for low growth sites to have higher contact rates, assuming the higher proportion of young households (also with higher contact scores) in the

higher growth sites did not offset this effect of older heads in the lower growth sites. There is a need to research and specify further the relative effects of variables on contact scores.

One of the findings presented here which deserves special attention is that respondents in the lower growth sites reported greater difficulty obtaining general practitioner services than did households in the higher growth sites. In one of the low-growth sites, the proportion approached one-fifth of all respondents (17 percent). Several questions need to be pursued further regarding this finding. Are these differences due to a lessened supply of services? Or are they due to the fact that the contact rate was greater, thereby increasing the likelihood that problems would exist? This line of reasoning relates to an issue noted above: Why are contact rates different? Further work is needed to explore this issue as the writers feel the obtained proportions for the lower growth sites are too high to go unattended. Research must specify further the nature of the problem(s) so that recommendations can be made to appropriate decision-making bodies.

References

1. Cordes, Sam M., "Assessment of Current and Recent Research on Rural Health Care Delivery by USDA and College of Agriculture." Paper presented at Rural Health Care Research Forum, Roanoke, Virginia, March 19, 1975.

2. Galvin, Michael E. and Margaret Fan, "The Utilization of Physicians' Services in Los Angeles County, 1973." Journal of Health and Social Behavior, Vol. 16, No. 1, March 1975, pp. 74-94.

3. McKinlay, John B., "Some Approaches and Problems in the Study of the Use of Services - an Overview," Journal of Health and Social Behavior, Vol. 13, No. 2, June 1972, pp. 115-151.

4. Monteiro, Lois A., "Expense is no Object: Income and Physician Visits Reconsidered," Journal of Health and Social Behavior, Vol. 14, No. 2, June 1973, pp. 99-114.