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WORKING PAPER NO. 35

The North Carolina Rural Health Research Program is designated and supported by the Office of Rural Health Policy, Health Resources and Services Administration, Public Health Service, U.S. Department of Health and Human Services. Grant No. CSR000002-03-0.

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Jerry D. Joines, MD*,†
Donald H. Taylor, Jr., MPA*
Joanne M. Garrett, PhD‡
Thomas C. Ricketts, III, PhD, MPH*
Timothy S. Carey, MD, MPH*,‡

*From the Department of Medicine, and the Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill.

†From the Internal Medicine Training Program, Moses H. Cone Memorial Hospital, Greensboro, NC.

‡From the Department of Medicine, University of North Carolina at Chapel Hill.

This research was supported by the Federal Office of Rural Health Policy, Grant No. CSR-000002; and the US Agency for Health Care Policy and Research, Grant No. CA54343. Dr. Joines was also supported by a National Research Service Award as a Primary Care Research Fellow at UNC.

URBAN/RURAL DIFFERENCES IN CARE SEEKING FOR ADULTS WITH ACUTE SEVERE LOW BACK PAIN

Abstract

Rurality is commonly assumed to represent a barrier to health care access, and should therefore result in lower health resource utilization. We examined urban/rural differences in care seeking for acute severe low back pain, using telephone interview data collected in 1992 from 485 randomly selected adult North Carolina residents with a recent low back pain episode. Two alternative definitions of rurality were employed: rural, based on 1990 percent urban population; and nonmetropolitan, based on 1993 Metropolitan Statistical Areas. Of the 485 subjects, 86 (18%) were classified differently by the alternative definitions of rurality. There was no significant overall association between care seeking and either rural residence (crude odds ratio, 1.43; 95% confidence interval, 0.88 to 2.30) or nonmetropolitan residence (crude odds ratio, 1.36; 95% confidence interval, 0.82 to 2.27). After controlling for the potentially confounding effects of region, race, education, pain severity, and sciatica, the association between care seeking and rural residence (adjusted odds ratio, 1.74; 95% confidence interval, 1.06 to 2.84) and between care seeking and nonmetropolitan residence (adjusted odds ratio, 1.66; 95% confidence interval, 1.03 to 2.67) reached conventional levels of significance. Rurality was not associated with choice of provider. We conclude that rural residents are at least as likely, and perhaps more likely, to seek care for acute low back pain. Alternative definitions of rurality can influence conclusions in studies of care-seeking behavior. Key words: health care seeking behavior, low back pain, rural health.

Introduction

Variation in the use of health care resources has received considerable attention since the methodology of small area analysis was described by Wennberg[1] in 1973. Such work has focused primarily on medical and surgical conditions which result in hospitalization, since hospital discharge data are more readily available than ambulatory care data. Most of the variation in hospitalization rates for both medical and surgical conditions is attributed to differences in physician practice style or supply factors such as the number of available hospital beds.[2] For many conditions, however, we do not know whether differences in care-seeking behavior may account for geographic variations in health resource utilization.

Perhaps the simplest geographic distinction is that of urban/rural designation. Urban/rural character is a component of proposed models of health care access,[3,4,5] and rurality is generally thought to represent a barrier to such access. Since access is not a quantity which can be directly measured, resource utilization is frequently employed as an indirect or proxy measure of access.[6] Fiedler,[7] in a comprehensive review of the literature on access and health care utilization, concluded that rural residents use fewer health care resources because they are deprived of access to those resources. Norton and McManus,[8] in a comparison overview of rural and urban populations, found rural populations to be older, poorer, and less likely to have a regular source of health care; rural residents also had worse self-reported health status and higher rates of chronic health conditions. A review by the Office of Technology Assessment[9] found less frequent utilization of physician services by rural populations. While lack of access in

rural areas has been attributed most directly to lower physician-to-population ratios, other determinants of utilization include distance, social class, income, health insurance status, symptom-specific personal beliefs, and system barriers.[6,10,11,12,13]

The concept of rurality is multifactorial, and is best described as a continuum rather than by a simple dichotomous classification.[14,15] Rurality can be defined in several ways. Typical dichotomous classifications include the U. S. Census Bureau urban/rural designation, and the Metropolitan Statistical Areas (MSAs) defined by the Office of Management and Budget; alternatively, the urban/rural spectrum may be classified by multi-level typologies which incorporate degree of urbanization, population density, distance, adjacency to metropolitan areas, and economic characteristics.[16] Although dichotomous classifications are simplistic, they are often used for health policy decisions.

We studied urban/rural differences in care seeking for back pain, using telephone interview data collected in 1992 from 485 randomly selected adult North Carolina residents with a recent episode of acute severe low back pain. The correlates of care seeking for these 485 subjects have been described elsewhere (Carey TS, Evans AT, Hadler NM, Lieberman G, Kalsbeek WD, Jackman AM, Fryer JG, McNutt RA. Acute severe low back pain: a population-based study of prevalence and care seeking. In preparation.); in that analysis, rurality was treated only briefly, as one of several potential correlates of care-seeking behavior, and no significant overall association was found between rural residence and either the decision to seek care or the choice of a doctor versus a chiropractor.

We present here an examination of these data which considers in greater detail the relationship between urban/rural residence and care seeking, and also explores the relationship between urban/rural residence and the specific type of provider chosen (primary care physician, specialist, or chiropractor). We used two alternative definitions of urban/rural status: one based on the 1993 Metropolitan Statistical Area designation, the other based on percent urban population from the 1990 census. Our goal was to answer three questions: (1) Are rural residents who suffer acute low back pain any more or less likely to seek care than urban residents? (2) For those who seek care, is rural residence associated with the type of provider seen? (3) Are these conclusions influenced by alternative definitions of rurality?

Methods

In February through April of 1992, a computer-assisted telephone interview survey of adult North Carolina residents was carried out using a two-stage stratified proportionate sampling design. In anticipation of geographic and urban/rural analysis, sampling was stratified by region and degree of urbanization. A sample of 2,053 subjects with low back pain were randomly selected from a roster of 8,067 back pain candidates identified in 4,437 households. Interviews were conducted by the Survey Research Unit at the University of North Carolina, using trained interviewers who were closely supervised by research staff. Statistical analysis was done using SUDAAN software,[17] and sample weights were incorporated into all analyses. Numbers of subjects reported here represent actual numbers prior to weighting. Acute severe low back pain was

defined as low back pain which lasted less than 3 months and which resulted in the inability to perform usual daily activities for at least one day. Of the 2,053 subjects interviewed, 485 reported acute severe low back pain; these respondents were considered in our analysis.

Two alternative definitions of urban/rural status, by county of residence, were employed in our analysis: (1) The county of residence was classified as metropolitan or nonmetropolitan using the 1993 Metropolitan Statistical Areas based on the 1990 Census (Figure 1). (2) Using 1990 census data, we computed the percent of each county's population living in urbanized areas and places of 2500 or more inhabitants outside urbanized areas. If 50% or more of a county's population lived in such urban areas, then the county was designated urban; otherwise, the county was designated rural (Figure 2).

Analysis was done for the most recent episode of acute low back pain, and included the following:

(1) We performed simple tests of overall association between nonmetropolitan residence and care seeking, as well as rural residence and care seeking.

(2) We performed logistic regression analysis of care seeking as the outcome of interest, with rural residence as the predictor of interest. Using backward elimination with a change-in-estimate[18] strategy, we examined the potentially confounding effects of region, age, gender, race, education, insurance status, pain severity, perceived health status, workman's compensation status, employment status, and the presence of sciatica. Similar analysis was carried out, substituting nonmetropolitan residence as the predictor of interest.

(3) We performed logistic regression analysis of choice of provider (chiropractor, primary care physician, specialist) as the outcome of interest, with rural residence as the predictor of interest, controlling for the potentially confounding effects of region, age, and gender. For the purpose of this analysis, the primary care category comprised family physicians, general practitioners, general internists, and emergency room physicians; the specialist category included orthopedic surgeons, neurosurgeons, and other specialists. Similar analysis was carried out, substituting nonmetropolitan residence as the predictor of interest, controlling for region, age, and gender. Because of limited sample size, additional variables were not included as potential confounders in the regression model.

Results

Of the 485 respondents who reported a recent episode of acute severe low back pain, 208 sought care from any provider. Of the 485, 86 (18%) were classified differently by the alternative definitions of rurality (Table 1); this primarily reflects the inclusion of rural counties in Metropolitan Statistical Areas.

The overall association (Table 2) between rural residence and care seeking was not statistically significant at the 5% level (crude odds ratio, 1.43; 95% confidence interval, 0.88 to 2.30). Logistic regression analysis resulted in a parsimonious model which controlled for potentially confounding effects of region, race, education, pain severity, and presence of sciatica; rural residence in this model was positively associated with care-seeking (adjusted odds ratio, 1.74; 95% confidence interval, 1.06 to 2.84).

Controlling for additional covariates led to similar point estimates and confidence intervals.

Similarly, the overall association between nonmetropolitan residence and care seeking was not statistically significant at the 5% level (crude odds ratio, 1.36; 95% confidence interval, 0.82 to 2.27). When logistic regression analysis was used to control for the potentially confounding effects of region, race, education, pain severity, and presence of sciatica, nonmetropolitan residence was positively associated with care seeking (adjusted odds ratio, 1.66; 95% confidence interval, 1.03 to 2.67). Controlling for additional covariates led to similar point estimates, and confidence intervals which only marginally achieved the conventional 5% level of statistical significance.

Among the 208 care-seekers, 107 sought care from a primary care physician, 26 from a specialist, 66 from a chiropractor, 6 from a nurse, and 3 from a physical therapist. When logistic regression analysis was used to control for potentially confounding effects of region, age, and gender, neither rural residence nor nonmetropolitan residence was significantly associated with choice of provider (Table 3).

Discussion

Compared to urban residents, rural residents in our study were as likely, and perhaps more likely, to seek care for acute severe low back pain. Choice of provider did not appear to be related to urban/rural status; this analysis, however, was limited by small sample size. If utilization is a proxy measure of health care access,[6] then our results suggest that rurality does not limit access to care for low back pain in our state.

This finding is not entirely without precedent. In the past, it was generally acknowledged that rural areas had lower health resource utilization due to access barriers for rural residents.[19] Opinions differ, however, as to whether these differences persisted through the last decade. Hicks,[6] for example, cites national data from 1980 and 1986 on number and frequency of physician visits as evidence of a widening gap between metropolitan and nonmetropolitan populations in utilization of physician services. In contrast, a national access survey by the Robert Wood Johnson Foundation[20] in 1986 reported "approximately equal access to the health care system" for metropolitan and nonmetropolitan residents, prompting Freeman et. al.[21] to conclude that "the long-standing gap in receipt of medical care between rural and urban residents appears to have been eliminated". This conclusion is by no means universally shared, and concerns about the availability of rural primary care physicians persist.[22]

It is interesting that neither rural nor nonmetropolitan residence was associated with choice of a physician versus a chiropractor. Gesler,[23] in an analysis of the role of chiropractors in health care delivery in North Carolina, reported that although chiropractors located in smaller places than allopathic physicians, both chiropractor-to-population ratios and physician-to-population ratios were negatively associated with rurality. Eisenberg et. al.,[24] in a national survey which focused on the use of unconventional therapies including chiropractic, reported little variation by size of community in the use of such therapies. Again, our results suggest that access to chiropractic care does not differ significantly in rural versus urban areas of our state.

Regarding the policy implications of our findings, our results should be interpreted with care. Rural residents may seek care for low back pain as frequently as urban residents, but this conclusion should not be extended to other medical conditions. Care seeking for low back pain among rural residents could be driven by cultural influences which offset otherwise limited access to health care resources in rural areas.[25] In addition, comparable levels of care seeking do not insure comparable quality of care or outcomes. Low back pain is usually a self-limited condition which can be managed effectively by primary care physicians without special skills or resources; most patients recover with conservative care. For other conditions, such as diabetes, hypertension, or heart disease, outcomes are more dependent on quality and continuity of care. It is important, then, to look at specific conditions when studying access; whenever possible, outcome measures should be considered as well.

Although rurality is intuitively a straightforward concept, formal definitions are not so clearly established. In this study, alternative definitions led to similar estimates of the association between rurality and care-seeking behavior; the significance of this association was slightly more convincing using the percent urban dichotomy. A substantial number (18%) of the subjects in this study were reclassified when the definition was changed from MSA to a percent urban classification. Research and health policy decisions which deal with rural health issues depend upon a reproducible and meaningful definition of rurality. Dichotomous measures, such as MSA designations, are less appealing than multifactorial measures, yet are widely used because of their simplicity. Further work in this area may validate one definition or typology above

others; for now, it is important that investigators at least be precise in their definition of rurality. For the reader who must interpret such research, a healthy skepticism regarding marginal associations is definitely in order.

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TABLE 1. Urban/Rural[a] and Metropolitan/Nonmetropolitan[b] Residence for Study Patients with Acute Severe Low Back Pain.

	Rural	Urban	Total
Nonmetropolitan	178	5	183
Metropolitan	81	221	302
Total	259	226	485

[a] Urban counties were defined by >=50% urban population based on the 1990 Census estimates.

[b] Metropolitan counties were defined by Metropolitan Statistical Area 1993 designations, based on the 1990 Census.

TABLE 2. Association of Care Seeking for Acute Severe Low Back Pain with Rural[a] and Nonmetropolitan[b] Residence.

Model	Outcome	Rural vs. Urban	Nonmetropolitan vs. Metropolitan
		Odds Ratio (95% CI)	Odds Ratio (95% CI)
Crude	Sought care	1.43 (0.88, 2.30)	1.36 (0.82, 2.27)
Logistic regression[c]	Sought care	1.74 (1.06, 2.84)	1.66 (1.03, 2.67)

[a] Defined as residence in a county having less than 50% urban population by the 1990 Census estimate.

[b] Defined as residence in a nonmetropolitan county by the 1993 Metropolitan Statistical Area designations.

[c] Adjusted for region, race, education, pain severity, and presence of sciatica. Nine observations were omitted due to missing values for an explanatory variable.

TABLE 3. Association of Type of Care Sought for Acute Severe Low Back Pain with Rural[a] and Nonmetropolitan[b] Residence.

Type of Care Sought	Rural vs. Urban	Nonmetropolitan vs. Metropolitan
	Odds Ratio[c] (95% CI)	Odds Ratio[c] (95% CI)
Doctor vs. Chiropractor	1.18 (0.55, 2.52)	1.12 (0.52, 2.43)
Primary care vs. Chiropractor	1.22 (0.55, 2.72)	1.12 (0.50, 2.49)
Specialist vs. Chiropractor	1.29 (0.45, 3.71)	1.09 (0.33, 3.55)
Primary Care vs. None	1.61 (0.88, 2.93)	1.63 (0.88, 3.02)
Specialist vs. None	1.58 (0.60, 4.14)	1.58 (0.58, 4.33)
Chiropractor vs. None	1.21 (0.59, 2.47)	1.31 (0.62, 2.76)

[a] Defined as residence in a county having less than 50% urban population by the 1990 Census estimate.

[b] Defined as residence in a nonmetropolitan county by the 1993 Metropolitan Statistical Area designations.

[c] Adjusted for region, age, and gender. Two observations were omitted due to missing values for an explanatory variable.

FIGURE 1: METROPOLITAN STATISTICAL AREAS - 1993

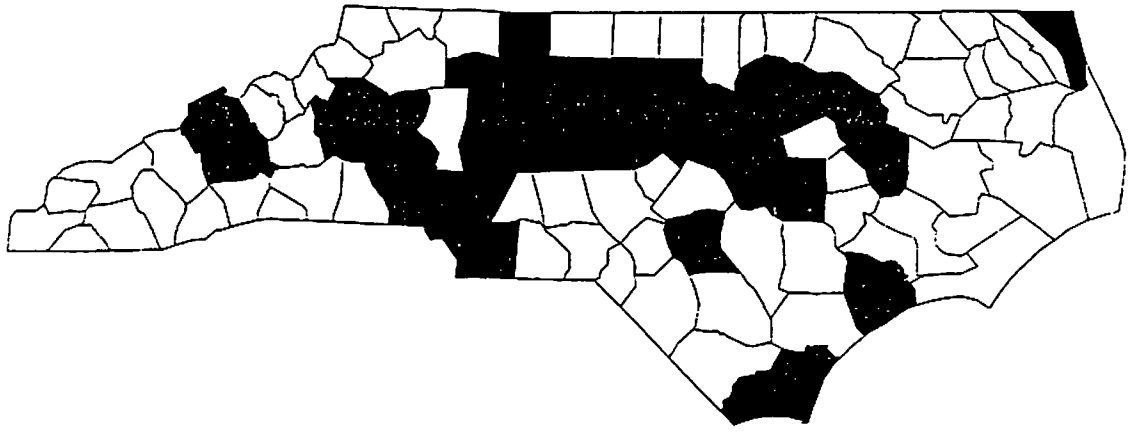
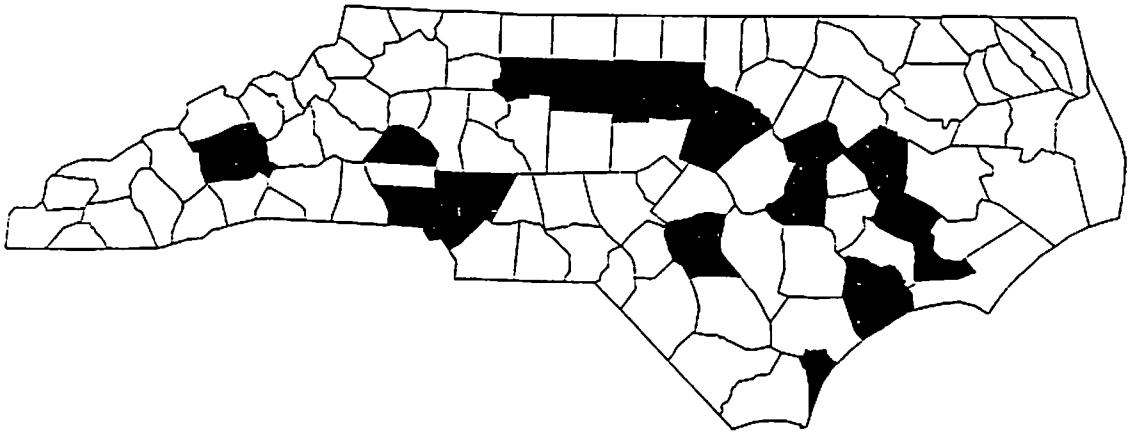


FIGURE 2: URBAN / RURAL BY PERCENT URBAN POPULATION



PERCENT URBAN POPULATION
1990 CENSUS

■ 51 to 100 (18)
□ 0 to 50 (82)