# Bypass of Local Primary Care in Rural Counties: Effect of Patient and Community Characteristics

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## ABSTRACT

**PURPOSE** This national study sought information from rural patients (1) to assess the prevalence of bypass, a pattern of seeking health care outside the local community; (2) to examine the impact of locally available primary care physicians (PCPs) and hospital size on the odds of bypass; and (3) to identify patient demographic and geographic factors associated with bypass. This study also ascertained the reasons patients give for bypass and their suggestions for how hospitals can retain patients locally.

**METHODS** We analyzed data from a 2005 telephone survey of 1,264 adults, aged 18 years or older, who lived within 20 miles of 25 randomly selected Critical Access Hospitals and were linked with a Health Professional Shortage Area and 2004 census data. Respondents were asked about demographic characteristics, travel time and distance to local hospitals, and insurance status, as well as for suggestions of what local hospitals could do to retain patients.

**RESULTS** Overall, 32% of respondents bypassed local primary care; the rate ranged from 9% to 66% across the Critical Access Hospital service areas. Factors associated with bypass included age, education, marital status, satisfaction with the local hospital, admission to a hospital in the past 12 months, hospital size, and local density of PCPs. Compared with residents in areas with a higher density of PCPs (≤3,500 residents per PCP), residents in areas with a low density (>4,500 residents per PCP) were more likely to bypass local care (odds ratio, 1.58; 95% confidence interval, 1.02-2.46). Lack of specialty care and limited services were most frequently mentioned as reasons why patients bypassed local hospitals.

**CONCLUSIONS** The sizable variation in bypass rates among this sample of Critical Access Hospital service areas suggests that strategies to reduce bypass behavior should be directed at the local community or facility level. Changing rural residents' perception of their local care, helping them gain a better understanding of the function of primary care, and increasing the number of PCPs might help hospitals retain patients and rural communities stay healthy.

## INTRODUCTION

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Bypass is a phenomenon traditionally associated with hospitals in which patients receive medical services from a health care professional or facility located farther away than the one closest to their residence. The use of urban professionals and facilities, in particular, by rural residents raises understandable concerns among policy makers and rural clinicians as it deprives the local professionals and the local community of revenue both directly and indirectly. In the extreme, bypass may result in reductions in the number of health care professionals and the range of medical services offered, or even hospital closures. The phenomenon of justifiable bypass describes the bypass of local hospitals by rural residents with more severe illnesses because the services they require

are not locally available.[1-3] This category also includes referrals to nonlocal professionals made by local physicians or local hospitals.[4]

It is important for rural professionals and policy makers to understand the extent to which rural patients bypass their local services and what community and hospital characteristics affect residents' decision to do so, as well as suggestions patients themselves offer to enable hospitals to retain them locally.

The extent to which patients bypass their local hospital and factors associated with this phenomenon have been studied extensively by analyzing medical claims data, hospital discharge data, or both. According to the literature, factors influencing bypass behavior include travel distance and time, payer mix, patient demographics (eg, age, sex, and race), severity of illness, diagnosis, and community characteristics (eg, income per capita).

Studies have found a decrease in the prevalence of bypassing local care with an increase in distance to alternative hospitals.[1,2,4-11] Patients covered by either commercial or managed care insurers have higher bypass rates than patients covered by other types of payers.[12] The elderly bypass local care less frequently,[1,2,4,10,11,13,14] and working men do so more frequently.[2,15] Diagnosis and severity of illness are also related to bypass. The literature offers evidence that community characteristics have an impact on bypass as well. Patients in counties with higher median income are less likely to have admissions outside of their county of residence.[1,15] A lack of county hospital resources is associated with more outside-of-county ambulatory care admissions.[1,3]

Few studies of patients bypassing their local hospitals and health care professionals have focused on rural residents. In addition, only 2 studies of this phenomenon have surveyed patients directly.[4,7] These studies found that patients bypassing local care would have used the local hospital if the required services had been available. Many respondents suggested that increasing the number of physicians would help retain more patients locally. These findings imply that community and hospital characteristics play an important role in the decision to bypass local care.

In this national study, we surveyed patients living near Critical Access Hospitals (CAHs).[16] CAHs are small and generally isolated rural community hospitals that are located a minimum of 30 miles from the next closest facility. They are certified to receive cost-based reimbursement from Medicare. The purposes of our study were to assess what percentage of rural residents bypass local professionals and facilities for primary medical care, to identify demographic and geographic factors associated with bypass, and to

solicit suggestions for what hospitals can do to retain patients locally. This study also examined how hospital size and the number of locally available primary care physicians (PCPs) relate to bypass.

## METHODS

### Data Sources and Sample

We used 4 different sources of data in this study. First, we randomly selected 25 CAHs from the October 2004 list of 978 active CAHs on the Rural Hospital Flexibility Grant Program Web site (http://www.flex-monitoring.org/documents/CAH_LIST_12_14_07.xls). The number of licensed beds for each selected CAH (a measure of hospital size) was obtained from the list.

Second, between early February and late July 2005, we surveyed by telephone 1,264 individuals living in an area within a 15- to 20-mile radius of the selected CAHs. Phone numbers were obtained for households within each of the 25 CAH service areas using Pro CD directory software (InfoUSA, version 2002, Omaha, Nebraska). A random number was assigned to every phone number, and the numbers were sorted for random selection. For any randomly selected phone number, we made 2 callbacks if no one answered the first call. Individuals were eligible if they were aged 18 years or older, and if they had experienced at least 1 inpatient admission in the past 12 months, had an outpatient physician visit in the past 6 months, or both. The targeted CAH represented the CAH closest to their residence. Interviews ceased when the desired sample size (n = 50) was met for each targeted CAH: 25 respondents with inpatient care and 25 with outpatient care, for a total of 50. The inpatient care stratum included both those who had only inpatient care and those who had both inpatient and outpatient care. In total, we contacted individuals in 6,023 households and 2,708 (45%) were willing to participate. Of the latter, 1,281 met the eligibility criteria and completed the questionnaire. The remaining 1,427 either did not meet the eligibility criteria or were not surveyed because the desired sample size had already been achieved.

Third, we drew county-level population data from the 2004 census data.

Finally, we obtained PCP density for the targeted CAH service areas from the Health Professional Shortage Area Web site of the Health Resources and Services Administration.[17] The number of PCPs necessary to achieve a PCP density of 1 per 3,500 county residents was available from the Web site for areas designated as Health Professional Shortage Areas. An area receives this designation from the federal government based on several criteria, including the presence

of fewer than 1 PCP per 3,500 residents. Twenty-one of the 25 CAHs in our sample were located in Health Professional Shortage Areas. We calculated the PCP density for these 21 CAHs from the number of PCPs necessary to achieve a PCP density of 1 PCP per 3,500 county residents and the county-level population.

The primary goals of the project were to estimate nationwide bypass rates and to examine factors associated with bypass. Our power calculations indicated that a sample size of 600 respondents was sufficient to estimate bypass rates at the patient level with reasonable precision (±4%) and to enable most kinds of data analyses, including logistic regression analysis. Our decision to survey 25 rural residents who had inpatient care and 25 who had outpatient visits in each of the 25 CAH service areas was based on a variety of considerations: budget constraints, generalizability of research findings, and the need to enable possible multilevel data analyses (at both patient level and facility/community level).

## Measurements

The survey questionnaire included questions about demographic characteristics (eg, age, sex), general health status measured with items from the 36-Item Short-Form Health Survey (SF-36),[18-20] travel time (minutes) and distance (miles) to the CAH from the respondent's home, and payer. Respondents were also asked to suggest how local hospitals could better retain patients. Additionally, we included 15 questions intended to assess respondents' satisfaction with the local CAH; possible responses to these questions, covering quality of inpatient care, outpatient care, medical care, medical equipment, and customer service, ranged from 1 (very poor) to 5 (excellent). Factor analysis indicated that these 15 questions represented a single component, and reliability analysis demonstrated a Cronbach α of greater than 0.9. We created a satisfaction scale from these 15 questions using the weight factor generated in the factor analysis. The local density of PCPs was categorized into 3 groups, according to the number of residents per PCP: 3,500 or fewer, 3,501 to 4,500, and more than 4,500.

Respondents' bypass behavior was determined by their response to the question, "Where do you usually go for primary medical care and is this place located in your community?" Respondents who usually went to a community hospital outpatient clinic (closest to where they lived), local community health center, local clinic, local physician's office, or other facility in their local community for primary medical care were categorized as usually seeking medical care locally (*local users*), whereas those who did not were categorized as usually bypassing local care (*bypassers*).

## Analyses

In bivariate analyses, we tested for differences between local users and bypassers using the $\chi^2$ test for categorical independent variables and the Student *t* test for continuous independent variables. We also constructed a multiple logistic regression model to assess factors associated with bypass. The independent variables included age, sex, race, travel time to the CAH, self-reported general health, satisfaction with the local CAH, insurance status, inpatient care in the past 12 months, number of licensed beds in the CAH, and density of PCPs locally. Because there were many missing values for the income variable, we did not include this variable in the logistic regression model.

All data analyses were done using SPSS statistical software version 14.0 (SPSS Inc, Chicago, Illinois). Weights were applied to the data to adjust for our equal sampling of inpatients and outpatients, since the population from which our sample was drawn experienced a greater number of outpatient than inpatient visits.

This study was approved by the Institutional Review Board of West Virginia University.

## RESULTS

Characteristics of the 25 CAH service areas from which the study sample was drawn are shown in Table 1. In total, only 5 of the service areas had 3,500 residents or fewer per PCP; 1 of these was located in a Health Professional Shortage Area and 4 were not. On average, the 25 CAHs had 20.4 licensed beds, with the majority having 16 to 25 beds.

Of the 1,281 respondents who completed the questionnaire, 17 did not meet sample selection criteria or did not answer some key questions and were excluded

**Table 1. Characteristics of the CAH Service Areas (N = 25)**

| Characteristic | CAH Service Areas |
|---|---|
| Location and PCP density | |
| Not located in an HPSA,[a] No. (%) | 4 (16) |
| Located in an HPSA, No. (%) | 21 (84) |
| ≤3,500 residents per PCP | 1 (4) |
| 3,501-4,500 residents per PCP | 10 (40) |
| >4,500 residents per PCP | 10 (40) |
| **Licensed beds** | |
| No. per CAH, mean (SD) | 20.4 (4.8) |
| Group, No. (%) | |
| 8-15 beds | 7 (28) |
| 16-25 beds | 18 (72) |

CAH = Critical Access Hospital; PCP = primary care physician; HPSA = Health Professional Shortage Area.

[a] All of these areas had 3,500 or fewer residents per PCP.

from analyses. The remaining 1,264 respondents included 657 who had been hospitalized in the past 12 months and 607 who had only an outpatient care visit in the past 6 months. Overall, 862 (68.2%) of these respondents were local users, usually receiving their primary care in their local community, while the remaining 402 (31.8%) were bypassers, usually going outside of their local community for primary care; however, the rate of bypass ranged considerably across the 25 CAHs, from 9.4% to 66%.

Table 2 presents demographic and geographic characteristics of the respondents overall and of bypassers vs local users. Respondents were predominantly white and insured. About one-half were older (≥65 years), and the majority were female. The average travel time was 11.5 minutes to the closest hospital and 41.4 minutes to the second closest hospital. Compared with local users, bypassers were younger, had higher incomes, were more likely to have had inpatient care in the past 12 months, and were less satisfied with their local CAH.

When asked to offer their opinion regarding actions their local CAH could take to keep patients locally, approximately 60% of respondents gave specific suggestions. Of this group, 17% suggested that the hospital add more physicians and services in general, and 24% suggested that the hospital add more specialty services. Another 17% mentioned that community hospitals need better physicians. The fourth most often mentioned suggestion, given by 11%, was a need for better customer service. There were no significant differences in the suggestions given by local users vs bypassers.

Respondents were asked to select from a list of 10 reasons why people might bypass local care. Most commonly, they cited lack of services/limited specialty care (50% of all respondents), referral out of the community by their physician (19%), poor quality of care (15%), and poor reputation of the local facilities

(14%). Among bypassers, only 5% cited health insurance as the reason for seeking care outside their local community.

Table 3 shows the results of our multiple logistic regression analysis. Compared with respondents aged 18 to 34 years, those in the 50 to 64 age-group were significantly less likely to bypass local primary care, and a similar trend was observed for those aged 65 years or older. Married respondents were more likely than others to bypass local care, as were respondents who had experienced an inpatient hospitalization in the past 12 months. Respondents who had some college education, who were more satisfied with their local CAH, and whose local CAH had more licensed

## Table 2. Demographic and Geographic Characteristics of All Respondents and of Bypassers vs Local Users

| Characteristic | All (N = 1,264) | Group Bypassers (n = 402) | Group Local Users (n = 862) | P Value |
|---|---|---|---|---|
| Age-group, % | | | | |
| 18-34 years | 10.0 | 10.1 | 9.9 | |
| 35-49 years | 14.9 | 19.0 | 12.9 | .04 |
| 50-64 years | 24.4 | 22.0 | 25.6 | |
| ≥65 years | 50.7 | 48.9 | 51.5 | |
| White, % | 94.2 | 93.8 | 94.4 | .70 |
| Female, % | 73.4 | 71.0 | 74.4 | .22 |
| Married, % | 62.7 | 65.6 | 61.3 | .15 |
| Have health insurance, % | 90.7 | 89.1 | 91.4 | .21 |
| Time to closest hospital, mean (SD), min | 11.5 (9.4) | 11.9 (10.5) | 11.4 (8.9) | .40 |
| Time to second closest hospital, mean (SD), min | 41.4 (21.2) | 41.9 (25.5) | 41.2 (20.4) | .68 |
| Self-reported general health, mean (SD), SF-36 score[a] | 3.1 (0.8) | 3.0 (0.8) | 3.1 (0.8) | .20 |
| Had inpatient care in the last 12 months, % | 11.0 | 15.6 | 8.8 | <.001 |
| Satisfaction with local CAH, mean (SD), score[b] | 3.9 (0.8) | 3.7 (0.9) | 4.0 (0.7) | <.001 |
| Education, % | | | | |
| Less than high school | 16.2 | 16.9 | 15.8 | |
| High school | 37.4 | 39.1 | 36.7 | .18 |
| Some college | 17.9 | 14.3 | 19.5 | |
| College or more | 28.5 | 29.7 | 28.0 | |
| Income, % | | | | |
| <$20,000 | 31.1 | 25.8 | 33.6 | |
| $20,000-$40,000 | 33.0 | 32.0 | 33.4 | .02 |
| >$40,000 | 35.9 | 42.2 | 33.1 | |
| PCP density, % | | | | |
| ≤3,500 residents per PCP | 20.2 | 20.5 | 20.0 | .12 |
| 3,501-4,500 residents per PCP | 41.1 | 37.1 | 42.9 | |
| >4,500 residents per PCP | 38.8 | 42.3 | 37.1 | |

SF-36 = 36-Item Short-Form Health Survey; CAH = Critical Access Hospital; PCP = primary care physician.

Note: We used the $\chi^2$ test (for categorical variables) and the Student $t$ test (for continuous variables) to test for significance of observed differences.

[a] Possible range of scores, 1-5; higher scores indicate better health.
[b] Possible range of scores, 1-6; higher scores indicate greater satisfaction.

beds were less likely to bypass local care, whereas respondents living in an area with a low density of PCPs were more likely to do so.

## DISCUSSION

Overall, about 32% of sampled respondents usually bypassed their local health care professionals for primary medical care. This bypass rate is within the range reported in prior studies of hospital bypass that used medical claims, discharge data, or both (eg, 20%-50%); however, we observed wide variation in bypass rates in our sample, ranging from 9.4% to 66% across the 25

**Table 3. Multiple Logistic Regression Analysis of the Odds of Bypassing Local Primary Care**

| Characteristic | Odds Ratio (95% CI) | P Value |
|---|---|---|
| Age-group | | |
|   18-34 years | Ref | |
|   35-49 years | 1.21 (0.67-2.18) | .53 |
|   50-64 years | 0.47 (0.26-0.84) | .01 |
|   ≥65 years | 0.62 (0.37-1.03) | .06 |
| Race | | |
|   Nonwhite | Ref | |
|   White | 1.43 (0.72-2.84) | .31 |
| Sex | | |
|   Male | Ref | |
|   Female | 1.32 (0.93-1.89) | .12 |
| Marital status | | |
|   Single, divorced, separated, or widowed | Ref | |
|   Married | 1.40 (1.01-1.96) | .047 |
| Health insurance status | | |
|   Uninsured | Ref | |
|   Insured | 0.86 (0.52-1.43) | .57 |
| Time to closest hospital | 0.86 (0.57-1.29) | .45 |
| Self-reported general health | 1.18 (0.95-1.45) | .13 |
| Inpatient care in the past 12 months | | |
|   No | Ref | |
|   Yes | 2.69 (1.73-4.18) | <.001 |
| Satisfaction with local CAH | 0.61 (0.51-0.74) | <.001 |
| Education | | |
|   Less than high school | Ref | |
|   High school | 0.84 (0.54-1.30) | .43 |
|   Some college | 0.37 (0.21-0.65) | .001 |
|   College or more | 0.70 (0.43-1.12) | .13 |
| No. of licensed beds of closest CAH | 0.95 (0.93-0.98) | <.001 |
| PCP density | | |
|   ≤3,500 residents per PCP | Ref | |
|   3,501-4,500 residents per PCP | 1.24 (0.79-1.92) | .35 |
|   >4,500 residents per PCP | 1.58 (1.02-2.46) | .04 |
| Constant | 3.37 (–) | .08 |

CI = confidence interval; Ref = reference group; CAH = Critical Access Hospital; PCP = primary care physician.

sampled CAHs. These data suggest a need for several types of strategies to address the issue of bypass in rural communities. First, the wide variation in bypass rates suggests that local communities and facilities need to develop tailored strategies that fit their own circumstances and needs. Second, policies that promote networks of health care professionals could benefit rural patients. Federal regulation requiring CAHs to form networks with larger hospitals might facilitate the creation of specific collaborative relationships with medical specialists, thereby broadening available services in local communities. These specialists could then provide services locally on a part-time basis. There is little in the literature, however, that addresses whether these "visiting" medical specialists attract patients to their home hospital for other types of medical care.

Hospital size and PCP density were strongly associated with bypass. Patients who bypassed their local primary care were significantly more likely to live in CAH areas where the hospital had fewer beds. These smaller hospitals, with about 8 to 15 beds each, tend to be more isolated and more vulnerable to closure. Similarly, respondents living in areas with a low PCP density (more than 4,500 residents per PCP) were 58% more likely to bypass local care than those who lived in areas with at least 1 PCP per 3,500 residents. This finding suggests that poorer access to PCPs in Health Professional Shortage Areas may be an important determinant of bypass. Problems with access to care were reflected in respondents' suggestions regarding what local hospitals could do to reduce bypass: offer more services in general, offer more specialty services in particular, and obtain more physicians. Simply adding more generalists and specialists to rural communities is not a feasible solution, however. Whether a community hospital should or could add more generalists or specialists depends on many factors, including the community's medical needs, the size of the population to support a generalist or specialist, and the ability of the community to recruit and retain these professionals.

Consistent with other studies, our results indicate that older age and greater satisfaction with local hospitals are associated with lower odds of bypassing local care. It is possible that older adults have more difficulties traveling or have stronger ties with local professionals. In our sample, married residents were more likely to bypass primary medical care. Perhaps having a spouse to drive the ill partner makes it easier to travel farther for needed medical care. Our sample had high rates of health insurance (mostly Medicare). Insurance status was not significantly associated with bypass, with fewer than 5% of respondents citing health insurance as a reason for bypassing local care.

Some 15% of respondents mentioned poor quality of care, and 14% identified the local facility's poor reputation as reasons why people might bypass the local CAH. Quality of care studies demonstrate that in rural settings, primary care professionals offer high-quality primary care, but they may not always provide access to specialty consultation.[21-24] When primary care clinicians have access to and can work closely with specialists, the care delivered may be more cost-effective and may lead to better health outcomes.[21-24]

A greater proportion of respondents recommended that communities recruit more specialists rather than more generalists as a means to reduce bypass. Their sentiment appears to reflect a devaluing of primary care in favor of specialty care, despite ever-increasing evidence that care organized around primary care is preferable.[25-27] Studies demonstrate lower mortality rates where there are more primary care physicians, but not where there are more specialists.[28]

These patient perceptions raise questions about how to change bypass behaviors. Ideally, patients would chose a local medical home that directs them as needed to the appropriate level of primary, specialty, and hospital care and, if necessary, to care outside their community. Changing the perceptions of rural residents with respect to the roles of primary care and specialty care and helping them understand the role of primary care might change some rural residents' practice of bypassing local care. Further efforts are needed to identify or develop effective mechanisms to achieve these goals.

Although self-reported general health status was not significantly associated with bypassing local care, hospitalization in the past 12 months was. The need for inpatient care can be viewed as a proxy measure for severity of illness. Sicker patients need more complex medical services and might be referred or transferred to specialty services or other hospitals outside their local community; furthermore, follow-up services after discharge for certain diagnoses (cancer, heart disease, kidney disease, stroke) may be routinely handled by specialists at the request of patients who believe that a primary care physician cannot provide the necessary follow-up for their condition. These factors may explain the higher likelihood of bypass among respondents who had recently been hospitalized. In this study, however, we were unable to examine the impact of these factors on bypass behavior.

There are several limitations to our study. One limitation relates to problems associated with phone surveys in general (eg, not everyone has a phone) and to our response rate of only 45%. Second, we did not ascertain respondents' medical diagnoses, thus limiting our ability to assess the possible impact of diagnosis

and illness severity on bypass. Third, generalizability may be limited because we sampled only 25 CAHs nationally and eligibility was limited to patients who had recent hospitalizations or outpatient visits; this approach resulted in a sample that was predominately older and insured. The fourth limitation is the small sample size at the community and facility levels with the result that bypass rates estimated at these levels are not very reliable. Last, the specific question used to ascertain bypass (Where do you usually go for primary medical care and is this place located in your community?) may not have been sufficiently precise. The terms *usually* and *primary medical care* might mean different things to different respondents. The operational definition of bypass may need additional attention in future studies.

Future research on the phenomenon of bypassing local care could include (1) studying the association between bypass rates and community demographics at the facility and community levels; (2) conducting community case studies in those CAH service areas with very low and very high bypass rates to carefully identify and examine bypass determinants and then implementing and testing measures to improve performance and services; and (3) evaluating the impact of bypass on local primary care professionals.

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