

# Understanding Rural Hospital Bypass Behavior

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## Table of Contents

EXECUTIVE SUMMARY .....	ii
INTRODUCTION .....	1
BACKGROUND .....	1
DATA.....	3
METHODS .....	4
Defining Bypass .....	4
Descriptive Analysis .....	7
RESULTS .....	7
CONCLUSION.....	22
REFERENCES .....	24

## EXECUTIVE SUMMARY

This study provides a descriptive analysis of rural hospital bypass behavior. Although this issue has been described as a barrier to financial viability for rural hospital facilities, little is known about bypass behavior. For example, what percent of rural residents who are discharged from hospitals bypass local facilities for their care? Does this rate vary over time, by diagnosis, or by payer type? We examine hospital discharge data in 1991 and 1996 from seven states to determine the extent to which patients admitted from rural areas are bypassing local facilities and whether there are changes in bypass patterns over time.

We use ZIP code information recorded for each patient and hospital to define bypass. Our primary specification defines bypass as a discharge from a hospital between 15 and 1000 miles from the closest facility. Based on this definition, we find an overall estimate of a 30% bypass rate. The overall bypass rate changed little between 1991 and 1996.

There are subgroups of patients with different propensities to bypass local rural facilities. Patients with managed care or commercial insurance have higher bypass rates compared to patients who rely on other payer sources. Medicare and uninsured (self-pay) patients have lower bypass rates. Between 1991 and 1996 these differences in bypass rates were accentuated as managed care became more prevalent and more rural residents qualified for Medicare. Payer type differences persist when admissions are divided into emergent and scheduled categories.

Type of diagnosis also is related to bypass. Patients seeking general medical or obstetrical care have lower bypass rates than patients discharged with a DRG related to complex medical, general surgery, or specialty surgery services. With the exception of normal delivery, DRG codes frequently associated with bypass discharges involve procedures or surgery that may not be offered by smaller rural facilities.

Our results suggest that rural patients, or their admitting physicians, perceive local rural hospitals as a viable option for many inpatient care services, but prefer other facilities for treatments that go beyond the scope of general medical or surgical treatment.

## **INTRODUCTION**

Rural residents often choose between local and non-local facilities for inpatient care services. This study examines which patient characteristics are associated with hospital choice. If the patient (or their provider) elects the local hospital, it may not offer the broad array of services offered by larger/urban facilities (Moscovice and Rosenblatt, 1982). However, other facilities require traveling further from home and receiving care from non-local providers (Hogan, 1988). Rural residents who perceive higher quality of care in non-local (urban) hospitals may remain in the local area for minor illnesses, but prefer other facilities for major illnesses or procedures (Rieber et al., 1996). Selective provider contracts between insurers that pay for the care and/or physicians who refer patients for hospital care also may impact bypass behavior. If a majority of residents in the rural community bypass the local hospital for inpatient services, the facility is likely to limit its scope of services, diversify to outpatient services, or close.

We examine hospital discharge data in 1991 and 1996 from seven states to determine the extent to which patients admitted from rural areas are bypassing local facilities and whether there are changes in bypass patterns over time. We examine the relationship between bypass behavior and patient characteristics thought to influence the bypass decision, including payer type and whether the hospitalization is emergent or scheduled. To determine the extent of competition between local and non-local hospitals for these patients, we also examine which diagnosis groups (DRGs) are most-frequently provided in local and non-local settings.

## **BACKGROUND**

Previous research has provided a range of estimates of the extent of bypass. Most of these studies are limited to a single geographic area or state or examine only one type of payer

(e.g., Medicare) or diagnosis (e.g., mental health or obstetrics). Recent estimates of the rate of bypass vary greatly according to the sample chosen. For example, Adams and colleagues (1991) estimate a 30 percent bypass rate for Medicare beneficiaries living in a single rural market area in Western Minnesota/NE South Dakota/ SE North Dakota (Adams et al., 1991; Adams and Wright, 1991), while Buckzo finds that rural Medicare beneficiaries in Delaware have a bypass rate of about 18 percent (Buczko, 1994). Bronstein and Morrisey (1991) focus on bypass rates in rural Alabama and find that between 40 and 45 percent of women went to non-local hospitals for obstetric services (Bronstein and Morrisey, 1991). Goldsteen and colleagues (1994) determine bypass rates among rural Illinois residents seeking inpatient mental health services (Goldsteen et al., 1994) and found a bypass rate of approximately 57 percent for their sample of approximately 2000 hospitalizations. Hogan (1988) finds that for rural residents of New York, the overall bypass rate for inpatient hospital care is 29 percent (Hotan, 1988). Williamson and colleagues (1994) find that bypass rates for surgical services among rural residents in Washington is approximately 44%, which reinforces the notion that rural patients perceive urban providers as more-qualified to deliver complex surgical services (Williamson et al., 1994; Taylor and Capella, 1996).

The variation in bypass rates found in the literature reflects differences in sample selection and differences in the definition of bypass. In general, less-restrictive definitions of bypass provide lower estimates for bypass rates, just as restricting the service type to specialty care increases estimates for bypass. We explain bypass rates according to a general measure of bypass prevalence for a large sample of rural residents from diverse regions of the U.S. over two sample years. This paper overcomes some limitations of other research by including multiple payer types and all discharges of patients from rural ZIP codes for the given sample years.

## DATA

This study relies on inpatient discharge data from 7 states for two years, 1991 and 1996. The states selected for the study include California, Florida, New York, Maine, Oregon, South Carolina, and Washington. States were selected to provide a broad geographic representation and varying levels of managed care penetration. In selecting particular states, we first determined whether our core set of variables were available. Only states that included full patient origin ZIP codes for rural areas were included. In addition, we required discharge status, admission type and source, expected payment source (at admission), length of stay, diagnosis/procedure codes, and a hospital identifier that allowed determination of its location (ZIP code). Other criteria for selecting states were based on maximizing variation in geography and ensuring that complete annual discharge data were available for this project.

Once states were identified, discharge data were obtained from each state and converted into a uniform data set with a select number of variables. To assure meaningful comparisons across states and years, some re-coding of variables to generate consistent categories was necessary. Because the hospital discharge data record only hospitalizations that occur within a specified state, the data do not include individuals who live in one of the seven states but are hospitalized in other states.

The analytic file includes approximately 1.6 million records for patients from rural counties who were hospitalized in either 1991 or 1996. For our analysis, we included only hospital discharges with a patient origination ZIP code consistent with a non-metropolitan county. Newborn infant (birth) discharges were excluded from the analysis since newborn infants, though discharged, are not admitted to hospitals. Including both infants and mothers would double-count each admission for labor and delivery and could bias our estimates of bypass

rates. We identified newborn infants using DRG codes as well as admission type information. This exclusion removed 96,565 observations in 1991 and 81,703 in 1996, or 10.6% of the total sample. The total number of discharges in our sample is 1,473,755.

The number of hospital discharges by state for patients residing in rural areas is shown in Table 1. Although the population of rural residents in each state increased between 1991 and 1996 (ARF 2000), the overall number of hospital discharges with patients originating in rural areas declined by 8 percent between 1991 and 1996. The only state in this sample with growth in hospitalizations by rural residents was Oregon (ARF 2000). New York faced the largest decline in the number of rural discharges with 20,000 fewer in 1996 compared to 1991. With 14,000 fewer rural discharges, Maine witnessed the largest percentage decline in rural hospitalizations, down 15% from 1991, but was closely followed by Florida, which had 14% fewer rural discharges. The overall decline in hospitalizations from rural areas in these states reinforces the concern that the patient base served by rural providers is declining. Limiting the number of patients who bypass local facilities for services they offer is an important issue for many rural hospitals.

## **METHODS**

### **Defining Bypass**

The literature offers some insight regarding a definition for bypass. Buckzo (1994), who restricted his sample to patients who resided in the same ZIP code as a single rural hospital, defines bypass as seeking care at a hospital that is not in the same ZIP code. Bronstein and Morrisey (1991) use a straight-line distance measure based on ZIP codes to determine the closest hospital providing obstetric services and measure whether the women in their sample traveled beyond that distance.

**Table 1**  
**Rural Hospitalizations By Year and State**

<b>State</b>	<b># Discharged Patients from Rural Areas, 1991</b>	<b># Discharged Patients from Rural Areas, 1996</b>
California	108,859	103,357
Florida	114,427	108,221
Maine	84,099	72,818
New York	151,337	146,816
Oregon	70,968	82,008
South Carolina	137,473	128,805
Washington	82,688	82,059
Total	749,671	724,084



We determined there were several feasible measures of bypass available for this application. Due to the large number of observations, we elected to use “As the Crow Flies” measures of distance. These calculations were made using the Great Circle distance formula with the longitude and latitude for each ZIP code’s geographic center. We calculated pair-wise distance measures for each ZIP code pair in the U.S. We then determined the distances between each patient ZIP code of origin that corresponds to a rural county and the ZIP code for the hospital of admission in our data set. We also identified the five closest hospital facilities to each rural patient ZIP code using this method. Though these straight-line distance measures are not completely accurate measures of travel time or road miles, the correlation between the two measures has been previously studied and found to be high (Phibbs and Luft, 1995). We calculated the marginal distance from the admitting hospital and the closest hospital to determine the bypass distance. For this research, the following three definitions were considered in determining overall measures of bypass:

1. The marginal distance calculation was greater than zero, meaning that the patient traveled further than the closest facility for treatment. We refer to this specification as BYPASS. This specification of bypass includes hospital discharges from any facility other than the closest, so will generate higher estimates of bypass rates.
2. The marginal distance was greater than zero, but less than 1000 miles. This definition eliminates patients who are traveling or living away from their residential ZIP code when they bypass the closest facility for care. This specification is referred to as BYPASS1K.
3. The marginal distance was at least 15 miles, but less than 1000 miles. This eliminates bypass cases where a patient was admitted to a hospital that was near the closest hospital in straight-line distance (miles). This is the most-conservative definition we construct and is referred to as BYPASS15.

## **Descriptive Analysis**

Our methodological approach for this research is descriptive with the goal of understanding the extent and time trends of bypass by rural residents requiring hospitalization.

The general research questions we address are:

- What is the extent of bypass by rural residents in 1991 and 1996?
- Does this vary by state?
- Does this vary by payer source (Medicare, Medicaid, commercial, HMO/PPO)?
- Does this vary according to the type of admission (scheduled vs. unscheduled)?
- Are there certain prevalent conditions for which bypass is more common?

Although tests of statistical significance were performed for all results, we do not find these meaningful for this very large sample. Thus, we point out substantive differences rather than statistical significance in the text.

## **RESULTS**

The specification of bypass impacts the extent of bypass noted in these data. Table 2 provides a description of the number and percent of discharges determined to be bypasses, according to each of the three definitions. As expected, the largest bypass rate is estimated when bypass is defined as any hospital except that closest to home. We find that including hospitals located near the closest provides estimates of bypass that are approximately 33 percent lower than our upper-bound estimate.

Comparisons of distance traveled for care among those who bypass and those who did not bypass their local market indicates that the added distance is not trivial. The average distance to the closest facility is less than six miles for the sample. Those who bypass the closest hospital travel an average of 27 additional miles.

Table 3 provides a breakdown of bypass rates by year. The frequencies and percentages for each individual year are approximately equal to that of the entire sample. Whereas the overall

**Table 2****Bypass Frequency and Rate by Definition of Bypass**

<b>Bypass Definition</b>	<b>Bypass Frequency</b>	<b>Bypass Rate (%)</b>
BYPASS	658,382	45.2
BYPASS1K	652,132	45.0
BYPASS15	435,284	30.0

**Table 3**  
**Bypass Frequency and Rates by Definition and Year**

<b>Bypass Definition</b>	<b>1991</b>		<b>1996</b>	
	<b>Frequency</b>	<b>Rate (%)</b>	<b>Frequency</b>	<b>Rate (%)</b>
BYPASS	336,496	45.4	321,886	45.0
BYPASS1K	333,501	45.2	318,631	44.7
BYPASS15	219,386	29.8	215,898	30.3

number of hospitalizations declined, the bypass rate remained steady across all our definitions. This suggests that the patient base for rural hospitals, though declining, was more stable than the total number of hospitalizations numbers reported in Table 1 might suggest.

Table 4 and those that follow define bypass as BYPASS15 – the definition that allows patients to receive care at any facility within 15 miles of the hospital nearest their residential ZIP code. We rely on this specification because our measure of straight-line miles may not accurately indicate which hospital facility is closest to a particular patient’s residence. This potential for measurement error occurs because roads are not perfectly straight and ZIP code distances are based on geographic centroids, which can represent large land areas in several states we examine. Allowing some flexibility in determining “close” hospitals, though not always “closest” should alleviate many of our concerns regarding the potential for mis-measurement of distance. The BYPASS15 specification provides this flexibility.

The overall percentage of bypass changed little between 1991 and 1996, but each state varied in its rate. Table 4 indicates that most states did not have substantial changes in bypass rates between 1991 and 1996, with less than one percentage point increases or decreases in the retention rates. The biggest increase in bypass was noted for rural hospitals in California, with an increase of approximately 3 percent in the bypass rate. With only one fewer rural hospital and 200 fewer beds in California’s rural hospitals, this decline is likely not related to resource availability (ARF, 2000). The rate of bypass in Oregon fell from 32% to 29%, which mirrors a slight increase in rural hospital bed availability over this time period (ARF, 2000). Other states witnessed smaller bypass rate changes, though several states sustained substantial changes in rural health resources. Florida and New York each lost over 1000 rural hospital beds and 2 or more rural hospital facilities between 1991 and 1996. Maine added a rural facility, but lost about

**Table 4**  
**Bypass Rates By State and Year**

<b>State</b>	<b>Bypass Rate in 1991 (%)</b>	<b>Bypass Rate in 1996 (%)</b>
California	29	32
Florida	35	36
Maine	25	27
New York	25	25
Oregon	32	29
South Carolina	32	30
Washington	34	34
Total	30	30

100 beds. South Carolina and Washington maintained stable hospital resources between 1991 and 1996, but added many rural physicians during this time (ARF, 2000).

The payer mix in rural areas is different than the payer mix in urban areas. Rural residents are less likely to have health insurance and are also less likely to receive health insurance through employment (Ricketts, 2000). In addition, managed care plans are not as likely to serve these areas (Casey, Moscovice, Klingner, 2002). Choice of hospital will be limited for those rural residents who have either HMO or PPO forms of managed care health insurance coverage. This may suggest that rural residents who work in urban areas with managed care insurance coverage bypass their local hospital in favor of a facility that is selectively contracted, provided that the care they are seeking is non-emergent. Table 5 provides the overall bypass rate by payer type using BYPASS15 to specify whether care was sought outside the local rural area. Data from 1991 and 1996 are pooled to reflect the minimal difference in bypass rates noted in Tables 3 and 4 above. Table 5 is followed by an analysis of emergent vs. scheduled care bypass rates by payer type to determine whether selective contracting affects bypass rates by rural residents.

Patients covered by either commercial or managed care insurance have higher bypass rates than other payer types (workmen's compensation coverage had the highest bypass rate at approximately 49%, but the sample size was small and could be a reflection of job locations in non-rural areas). The lower rates of bypass reflect elderly patients (Medicare) and those without insurance coverage (self-pay and charity care). Medicare beneficiaries, primarily elderly, are responsible for the same level of cost-sharing regardless of their hospital provider, and do not have financial incentives to select particular hospitals. The lower rate of bypass for elderly could suggest transportation issues or difficulty traveling for this group of patients. It may also reflect

**Table 5****Number of Discharges and Bypass Rate by Payer Type**

<b>Payer Type</b>	<b>Number of Discharges</b>	<b>Bypass Rate (%)</b>
Medicare	611,929	26.7
Medicaid	221,764	27.8
Commercial or Blue Cross	391,351	34.1
Managed Care (MHO/PPO)	74,921	38.3
Self Pay	67,268	26.5
No Charge	14,041	26.7



loyalty to local rural providers. Lower rates of bypass for self-pay and no-charge payer categories could reflect transportation issues or a more prominent non-profit mission by local rural facilities.

When examined over time, the disparity in the number of discharges associated with commercial or Blue Cross insurance is striking. Table 6 shows a decline from 231,000 discharges to 160,000 discharges associated with this type of payer between 1991 and 1996, though this decline is not associated with a change in bypass rate. An increase in managed care enrollment along with an increase in Medicare enrollment, which are consistent with secular trends of cost-containment efforts by employers and the aging population in rural areas, account for much of the difference in discharges noted for commercial/Blue Cross payers. There are approximately 10,000 additional discharges in 1996 associated with ‘self-pay’, or uninsured, payment sources. Though the bypass rates remain stable for most payment sources, there is a substantial increase in the rate of bypass for patients with managed care coverage and a substantial decline in bypass rates for those without insurance.

Type of admission, defined by scheduled or urgent/emergent, has the predicted relationship to bypass rates (Table 7). As expected, rural patients needing immediate care tend to be admitted to local facilities, while those with greater flexibility (scheduled admissions) have higher bypass rates. The table below provides the unadjusted rates along with the rates by payer type. Self-pay (uninsured) and Medicaid patients are least likely to bypass local hospitals regardless of admission type. For unscheduled (emergent) care, patients with Medicare have the greatest change in bypass rates. As expected, managed care patients are most likely to bypass among all payer categories, but the bypass rate for emergent admissions is substantially lower compared to managed care bypass rates for scheduled hospital stays.

**Table 6**  
**Bypass Rate by Payer Type and Year**

<b>Payer Type</b>	<b>Total Discharges, 1991</b>	<b>Bypass Rate, 1991 (%)</b>	<b>Total Discharges, 1996</b>	<b>Bypass Rate, 1996 (%)</b>
Medicare	292,935	26.3	318,994	27.0
Medicaid	116,156	27.0	105,608	28.7
Commercial or Blue Cross	230,928	34.0	160,423	34.2
Managed Care (HMO/PPO)	16,488	33.7	58,433	39.5
Self Pay	28,910	29.2	38,358	24.7

**Table 7**  
**Bypass Rates by Admission Type and Payer**

<b>Payer Type</b>	<b>Emergent Cases</b>		<b>Scheduled Cases</b>	
	<b>Total Discharges</b>	<b>Bypass Rate (%)</b>	<b>Total Discharges</b>	<b>Bypass Rate (%)</b>
Medicare	312,201	22.1	97,246	41.1
Medicaid	106,855	26.1	37,852	37.1
Commercial or Blue Cross	149,449	30.0	83,088	41.2
Managed Care	42,211	35.2	26,095	44.8
Self Pay	36,451	24.6	10,944	29.0
<b>All</b>	<b>679,637</b>	<b>26.0</b>	<b>272,548</b>	<b>41.0</b>

Certain types of services are available at most hospitals, while others require specialized training or equipment available only at larger hospitals, teaching facilities, or regional medical centers. First, we group all hospitalizations into 5 categories based on the recommendation of a panel of physicians, as described in a previous paper (Stensland et al., 2002). The general categorizations are:

- Basic Medical
- Complex Medical
- Obstetrics
- General Surgery
- Specialty Surgery

As expected, bypass rates for basic medical and obstetrics are lower than for complex medical, general surgery, and specialty surgery (see Table 8). Specialty surgery, with a bypass rate over 50%, reflects the smaller scope of services generally offered by local hospitals in rural areas. Because we are concerned that the rate of bypass by type of diagnosis may have changed over time, the bypass rates for each year are presented as well. The overall patterns of bypass are consistent over time, though there is a decrease in bypass rates for medical diagnoses and an increase in bypass for surgical treatments. The largest increase in bypass was for complex surgical cases, suggesting that certain types of cases are moving away from rural hospitals while others are increasingly retained.

Because of the patterns noted in Table 8, we examine which types of hospitalization remain in the local area and which are most frequent for bypassing the local area. The ten most-frequent DRG codes (at discharge) for hospitalizations by whether or not the patient (non-newborn) bypassed the local market are listed in Table 9. This table provides evidence of little overlap, besides obstetrics, between the services received locally and at non-local hospitals.

**Table 8**  
**Bypass Rates by Service Type (Grouped DRGs)**

<b>Type of Diagnosis</b>	<b>Total Discharges (1991 &amp; 1996)</b>	<b>Overall Bypass Rate (%)</b>	<b>Bypass Rate, 1991 (%)</b>	<b>Bypass Rate, 1996 (%)</b>
All	1,404,409	29.3	29.0	29.6
Basic Medical	551,338	21.2	21.3	21.0
Complex Medical	342,932	30.1	30.8	29.4
Obstetrics	163,400	23.4	23.3	23.4
General Surgery	129,710	31.8	31.0	32.6
Specialty Surgery	217,029	51.6	50.1	53.2

**Table 9****Most Frequent DRGs By Bypass (1991 and 1996 combined)**

<u><i>Most Frequent DRGs without Bypass</i></u>			<u><i>Most Frequent DRGs with Bypass</i></u>		
<b>DRG</b>	<b>Frequency</b>	<b>DRG Definition</b>	<b>DRG</b>	<b>Frequency</b>	<b>DRG Definition</b>
373	79,534	Vaginal Delivery without complication	373	22,849	Vaginal Delivery without complication
127	37,217	Heart Failure and Shock	112	14,781	PTCA
89	29,992	Pneumonia	215	11,190	Back and Neck procedures with complication
140	21,916	Angina	430	11,026	Organic Disturbances and Mental Retardation
14	20,488	Cerebrovascular Disorders except TIA	209	10,150	Major Joint and Limb Reattachment Procedures (lower extremity)
371	20,326	Caesarian Section without complication	359	7,732	Uterine and Adnexa Procedures
182	19,759	Esophagitis and gastric disorders	410	7,440	Chemotherapy
88	19,077	COPD	124	7,261	Cardiac Catheterization without AMI or complex diagnosis
359	16,554	Uterine & Adnexa Procedures	125	7,141	Cardiac Catheterization with complex diagnosis, without AMI
143	15,964	Chest Pain	371	6,679	Caesarian section without complication

Specialty services provided in non-local hospitals influence bypass rates. This is reflected in the frequency of DRGs associated with cardiac catheterization (PTCA as well as two types of diagnostic catheterization). Micro-surgery and neurosurgery, required to re-attach limbs and repair complex back or neck injuries and perform hip replacement procedures, are unlikely to be offered at small rural hospitals. Inpatient treatment for mental illness and chemotherapy also require specialization not typically found in small rural facilities. Table 9 suggests that bypassed facilities may lose patients for complex services, but retain patients who are hospitalized for many less-specialized services.

Table 10 presents the five most frequent DRGs associated with bypass and non-bypass for 1991 and 1996. The bypass rate for each of these DRGs is also included to indicate the percentage of cases that leave the local area. For example, the most-common reason for hospitalization in both years and in both categories is normal vaginal delivery (DRG 373). Though thousands of deliveries were obtained at distant facilities, the bypass rate is about 22% both years. In contrast, 90% of cases involving PTCA (DRG 112) were performed outside of the local rural hospital market. The DRG with the largest increase in bypass rate among those for which bypass is common was back and neck procedures (DRG 215). With the exception of vaginal delivery, the number of discharges for each of the common DRGs associated with bypass increased between 1991 and 1996. Three of the five procedures are surgical – one cardiovascular (DRG 112 is PTCA), two orthopedic (DRG 209 and 215). Mental health services represent the fifth most-common DRG associated with bypass in both years.

Among the most common DRGs retained in local rural areas, bypass rates remain below 25%. Hospitalizations for pneumonia (DRG 89) and for heart failure and shock (DRG 140) have the lowest bypass rates (approximately 12%), and show slight declines between 1991 and 1996.

**Table 10****DRGs Associated with Bypass, 1991 and 1996**

<b>Most Frequent DRGs with Bypass</b>					<b>Most Frequent DRGs without Bypass</b>				
<b>1991</b>		<b>1996</b>			<b>1991 Rate</b>			<b>1996 Rate</b>	
<b>DRG</b>	<b># Cases</b>	<b>Bypass Rate</b>	<b># Cases</b>	<b>Bypass Rate</b>	<b>DRG</b>	<b># Cases</b>	<b>Bypass Rate</b>	<b># Cases</b>	<b>Bypass Rate</b>
373	12,296	22.4	10,553	22.2	272	42,562	22.4	36,972	22.2
112	6,249	90.5	8,532	90.0	127	17,655	14.5	19,562	14.6
215	5,526	65.8	5,664	70.4	89	13,847	12.2	16,145	11.8
430	4,713	46.7	6,313	46.5	140	14,563	12.9	7,353	11.7
209	4,554	40.4	5,596	38.7	371	11,656	24.5	8,670	25.0



Caesarean deliveries (DRG 371) have the highest rate of bypass among this group of commonly retained diagnoses, with approximately one-fourth of cases leaving the local market. These types of deliveries may be scheduled in advance, so follow the results suggested in comparing emergent versus scheduled inpatient stays.

## **CONCLUSION**

The results presented in this paper indicate that several factors are associated with bypassing rural hospitals. The overall rate of bypass remained steady between 1991 and 1996, though the estimate for this rate depends heavily on the definition of bypass. The results are sensitive to which specification of bypass is chosen, so we conducted sensitivity analyses to determine whether trends or other results would change. Beyond the increase in bypass rate estimates by approximately 15% if the definition is changed from BYPASS15 to BYPASS, the patterns of results remained consistent across measures.

There was little change in the rate of bypass for individual states between 1991 and 1996. When bypass rates are examined according to payer type, patients covered through managed care plans or commercial insurance were most likely to bypass local rural hospitals for care. Medicare beneficiaries and the uninsured have the lowest rates of bypass. Selective contracting is likely to limit choice of hospital for patients with managed care coverage. Payer type disparities in bypass rates indicate that transportation issues or a hospital mission related to charity services supports the retention of a sicker and older patient mix within rural communities while losing younger/healthier patients to other markets. Payer type differences in bypass rates suggest that quality of care differences are perceived by younger patients or those with employer-sponsored coverage. These differences according to payer type persist after controlling for whether the admission is emergent.

The analysis of bypass rates by diagnosis type provides evidence that rural residents leave the local rural hospital to seek care for more-complex services, with a 20% difference in the bypass rate for specialty surgery versus general surgery. Beyond obstetrical services, the DRG codes associated with hospital discharges are different for bypass discharges compared to non-bypass discharges. Specifically, DRG codes associated with bypass discharges involve procedures or surgery that may not be offered by smaller rural facilities.

Patients who participate in a managed care plan and those with complex medical or surgical diagnoses have higher bypass rates than other types of patients. Older patients and those requiring less complex services have lower bypass rates. This suggests that rural patients (or their admitting physician) perceive local rural hospitals as a viable option for many inpatient care services, but prefer urban facilities for treatments that go beyond the scope of general medical or surgical treatment.

In summary, this research extends previous studies that have examined the tendency of rural residents to seek hospital care outside of their local communities. Our research provides important information regarding the types of care sought at non-local hospitals and demonstrates the stability of these patterns over time. Future studies will be directed at models to predict bypass behavior and the outcomes of these decisions. We plan to examine whether bypass has attendant impacts on outcomes of care once we control for patient and hospital characteristics.

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