

## Rural-Urban Differences in Visits to Primary Care Physicians

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**Background and Objectives:** *Our study explored ambulatory practice differences between rural and urban primary care physicians. Because most rural practitioners are not educated through special rural tracks, all primary care medical educators need to ensure that training prepares physicians for the demands of rural sites. **Methods:** Visits to family, general practice, internal medicine, and pediatric physicians from the 1996 and 1997 National Ambulatory Medical Care Surveys were analyzed. "Rural" was defined as outside a metropolitan statistical area. **Results:** Family physicians handled the majority of rural visits, even among pediatric populations. Acute injuries represented 6.1% of rural visits versus 5.0% of urban visits. Conditions likely to be associated with pain (degenerative joint disease, low-back pain, myalgias, headaches, and bursitis) were higher among rural visits (8.5% versus 5.4% urban). Preventive counseling and services and anticipatory guidance for children were provided less frequently in rural visits. **Conclusions:** Physicians entering rural primary care practice need training in acute injury and chronic pain syndromes, as well as ample exposure to care for children. Research is needed to explain the less-frequent provision of clinical preventive services in rural areas. Given clinical similarities between rural and urban visit content, subtle differences in provision of acute care and preventive services may provide important clues to training needs among physicians preparing to enter rural practice.*

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Family physicians are the principal health care providers for rural America. Family medicine is the only discipline in which the ratio of physicians to population is greater in rural than in urban areas.<sup>1</sup> Family practice residency programs have responded to the need for rural providers; in 1998, 10% of programs had some rural training in their curricula,<sup>2</sup> though the number of programs with dedicated rural tracks is much smaller. Dedicated rural residency tracks graduated only 77 physicians between 1988 and 1997,<sup>2</sup> far fewer than the approximately 600 family medicine graduates who enter rural practice each year.<sup>3</sup> In addition, such programs have lower National Resident Matching Program fill rates than do all family practice residencies (61% versus 88%).<sup>4</sup>

Training family physicians and other primary care physicians to practice effectively in rural settings requires specific attention to the clinical content they are most likely to encounter in those settings. Urban residency experiences may or may not reflect what the physician will encounter in rural practice. While a study of patient visits in a Southern, urban family practice residency clinic found that the diagnoses coded closely paralleled those for family physicians and general practitioners in the South,<sup>5</sup> an examination of the practice experience of rural general surgeons found that rural clinical needs differed sharply from experience in surgical training. For example, while the typical general surgery resident averaged only 1.6 gynecological cases annually, the rural surgeons who were studied averaged 70 such cases each year.<sup>6</sup> Within family medicine, Holden and David have described the top 22 diagnoses encountered across 752 hospital admissions in rural areas,<sup>7</sup> but we are not aware of other studies examining the clinical content of ambulatory family medicine, as opposed to inpatient care, in rural areas.

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Our study explored differences in clinical content and practice patterns between rural and urban primary care physicians in ambulatory settings, and we comment on the implications of such differences for resident education.

#### Methods

The study was based on a cross-sectional analysis of visits to physicians' offices. The data sources were the 1996 and 1997 National Ambulatory Medical Care Surveys (NAMCS).<sup>8,9</sup> The NAMCS, conducted annually by the National Center for Health Statistics, develops national estimates of the content of ambulatory care by sampling visits made to free-standing physician offices. A one-page form asked participating practices to summarize information from each encounter, including patient demographics, reasons for visit, physician diagnoses, procedures provided, and medications prescribed. Separate check-off boxes were used for recording selected diagnostic/screening services and therapeutic and preventive services. The NAMCS sampling frame divided the nation geographically into 112 primary sampling units, from which physician offices were contacted and requested to provide information on a sample of visits. The 1996 survey yielded 29,805 visits from 2,142 physicians; the 1997 survey yielded 24,715 visits from 1,801 physicians. Years were combined to yield an adequate sample of nonmetropolitan visits. Details of the sampling frame and response rates are available in National Center for Health Statistics (NCHS) reports.<sup>10,11</sup>

We restricted our analysis to primary care physicians, which we defined as family physicians, general internists, and pediatricians. These clinicians are the providers most likely to be found outside metropolitan areas. Limiting the analysis to primary care physicians reduced the total 2-year sample to 19,409 visits, including both urban and rural areas. "Rural" was defined as "non-metropolitan statistical area," with "urban" defined as "metropolitan statistical area." The NAMCS sampling frame, as released in the public use data set, does not allow further specification of "rural."

#### Data Analysis

The NAMCS sample is weighted to allow the generation of national estimates. Our analysis applied the population weights using the SAS<sup>®</sup> statistical program (Cary, NC) to generate national estimates for rural versus urban visits to primary care physicians. NAMCS documentation for 1996 and 1997 noted that any estimate based on fewer than 30 is considered unreliable. For the 2 combined years, we consider any estimate based on fewer than 60 observations unreliable.

To determine whether a difference between two categories (eg, urban and rural) is statistically significant, variance estimates are needed. The variance informa-

tion published by NAMCS applies only to one full data set; that is, data for 1 full year that includes all relevant cases. When this analysis was being conducted, the NAMCS data sets released for public use did not contain the detailed stratification and primary sampling unit variables needed for variance estimation when data sets are combined (1996–1997) and analysis restricted to a subset of the data (primary care physicians). We therefore cannot associate probabilities with the differences in distributions of patient characteristics, diagnoses, payment source, counseling, and preventive services found by the study, as would be needed to define statistically significant differences. We considered a difference of more than 1% meaningful because of the potential number of visits involved. Specifically, 1% of the estimated 167 million rural patient visits occurring in the 2-year period equals 1.67 million visits.

Clinical information about patients' reasons for visits is presented using the "Reason for Visit" classification of the NAMCS. We present diagnostic information in both *International Classification of Diseases, Ninth Revision* (ICD-9) summary classes and in Schneeweis Clusters,<sup>12</sup> a coding system developed for presenting the clinical content of ambulatory care. (We obtained the most recent version of the Diagnostic Clusters [Version 4.1, 1998] from the University of Washington.) We only examined principal diagnosis.

#### Results

##### Overview of Patient Populations

An estimated 792 million visits were made to primary care physicians' offices in the 2-year period of 1996–1997. Of these, 624 million involved physician offices in urban areas, and 167 million involved practitioners in rural areas. In urban settings, family physicians accounted for about one third of all visits; this proportion was nearly double in rural regions (Table 1). Even among patients ages 14 or younger, the majority of rural visits were made to family physicians.

Table 1

Distribution of Urban and Rural Visits, by Specialty of Provider, 1996–1997

| % Visits                     | Family Practice | General Practice | Internal Medicine | Pediatrics |
|------------------------------|-----------------|------------------|-------------------|------------|
| All patients                 |                 |                  |                   |            |
| Urban                        | 34.2            | 8.9              | 29.9              | 27.0       |
| Rural                        | 60.3            | 9.3              | 22.1              | 8.3        |
| Patients ages 14 and younger |                 |                  |                   |            |
| Urban                        | 16.0            | 5.0              | 2.0               | 77.0       |
| Rural                        | 53.0            | 4.0              | 2.0               | 41.0       |

Rural areas were more racially homogenous than metropolitan areas. African American patients made up only 9% of visits to rural physicians, versus 12% in urban areas; other non-white races were 1% of visits to rural physicians versus 4% in urban areas. In addition to including fewer minorities, patients in rural areas were older. While 30.9% of rural patients were ages 65 or above, only 19.8% of urban patients fell into this age group (Table 2). Rural visits were more likely to be funded by Medicare or Medicaid than urban visits and less likely to be funded by private insurance (Table 3). Two separate questions in the 1997 NAMCS inquired whether visits, regardless of payor, involved an HMO or a capitated payment mechanism. Only 13.5% of all visits to rural primary care physicians, versus 36.8% to urban primary care physicians, involved patients with insurance coverage through an HMO. Similarly, only 3.1% of visits in rural settings were reported as being under a capitated plan, versus 18.4% of visits in an urban area.

Visits to nonphysician providers were more common in rural regions. Thus, 6.4% of rural visits, but only 3.6% of urban visits, involved a nonphysician provider, such as a registered nurse, nurse practitioner, physician assistant, licensed practical nurse, or medical assistant.

**Reasons for Visit and Principal Diagnoses**

The top 20 reasons patients gave for visiting a health care provider are shown in Table 4, listed in order of their frequency among patients in rural areas. These patients were more likely to cite specific problems as leading to their visit and less likely to report visiting for a general medical examination or a well-child examination.

The diagnostic categories associated with ambulatory care visits in urban and rural areas are shown in Figure 1. Diseases of the circulatory and musculoskeletal systems and injuries/poisoning were more common in rural areas.

When sick visits (ie, excluding general medical examinations) were examined by Schneeweiss diagnosis cluster, differences were seen (Table 5). Visits for acute injury and pain were higher in rural areas. Acute injuries (lacerations, sprains, fractures) represented 6.1% of visits in rural

Table 2

Distribution of Visits, by Age of Patients and Region, 1996–1997\*

| Region | AGE (YEARS)    |       |       |       |       |              |
|--------|----------------|-------|-------|-------|-------|--------------|
|        | 14 and younger | 15–24 | 25–44 | 45–64 | 65–74 | 75 and older |
| Urban  | 31.8%          | 7.4%  | 20.6% | 20.4% | 10.6% | 9.1%         |
| Rural  | 19.1%          | 8.0%  | 21.4% | 21.7% | 14.3% | 15.6%        |

\* Percentages do not equal 100% due to rounding.

areas versus 5.0% of visits in urban settings. Conditions likely to be associated with pain (degenerative joint disease, low-back pain, myalgias, headaches, and bursitis) accounted for 8.5% of visits to rural physicians, versus 5.4% to urban physicians.

**Provision of Preventive Counseling Services**

The NAMCS survey obtained information on the provision of selected preventive counseling and services

Table 3

Visits by Primary Expected Source of Payment and Location of Practice, 1997 Only\*

| Payment source                                | Urban | Rural  |
|---|-------|--------|
| Private insurance                             | 55.8  | 49.8   |
| % private insurance reported as capitated     | 22.3  | 3.6    |
| % private insurance reported as HMO           | 49.3  | 18.2   |
| Medicare                                      | 16.8  | 24.7   |
| % Medicare reported as capitated              | 8.6   | 1.9**  |
| % Medicare reported as HMO                    | 13.2  | 3.2**  |
| Medicaid                                      | 9.3   | 13.4   |
| % Medicaid reported as capitated              | 10.4  | 1.7    |
| % Medicaid reported as HMO                    | 18.6  | 19.3** |
| Worker's compensation                         | 1.0   | 1.8    |
| % Worker's Compensation reported as capitated | 1.6** | 0**    |
| % Worker's Compensation reported as HMO       | 8.4** | 5.4**  |
| Self-pay                                      | 7.9   | 5.2    |
| % self-pay reported as capitated              | 1.4** | 1.1**  |
| % self-pay reported as HMO                    | 2.7** | 1.5**  |
| Other   | 6.6   | 3.0    |
| % other reported as capitated                 | 48.0  | 14.5** |
| % other reported as HMO                       | 70.5  | 18.7** |
| No charge                                     | .4**  | .3**   |
| Unknown                                       | 1.2** | 1.0**  |

\* Because of differences in the way payment source data were collected in 1996 and 1997, this analysis is limited to 1997.

\*\* Estimate based on fewer than 60 observations; too small to be reliable.

via a specific check-off box on the form, separate from diagnoses and procedures. Preventive counseling was more commonly recorded in urban practices. Among adults (ages 15 or above), 21.0% of visits to urban practices included diet counseling, whereas this occurred only 16.1% of the time in rural practice. Similarly, exercise counseling (15.0% urban versus 13.0% rural) and tobacco counseling (4.4% urban versus 3.6% rural) were more common in urban physician offices. Injury prevention counseling was recorded slightly less often in rural practice (2.1% rural versus 2.7% urban), despite the fact that injuries were a more common reason for visit in these areas.

Preventive services were also less-frequently reported by rural practices. While blood pressure measurement was equally common in urban and rural settings (74.5% urban, 73.8% rural), other types of screening were provided less often in rural areas: urinalysis (14.2% urban, 10.8% rural), cholesterol screening (8.7% urban, 4.3% rural), and rectal examinations (5.2% urban, 2.9% rural). Looking only at women, pelvic screening was provided at a similar rate across regions (5.9% urban, 5.3% rural), but breast examination was not (7.0% urban versus 5.5% rural).

Anticipatory guidance for children was more likely to be provided during physician visits in urban areas. Among children up to age 14, counseling regarding growth and development was more common in urban settings (17.5% urban versus 9.8% rural), as was counseling regarding diet (17.3% urban, 9.4% rural; rural estimate based on fewer than 60 observations).

While both urban and rural physicians completed an equal proportion of all visits with 10 minutes or less of physician time (35% urban and rural), the total proportion of visits completed in 15 minutes or less was slightly higher in rural (70.9%) than in urban settings (68.6%) (Figure 2). At a practical level, however, differences were small. Rural physicians averaged 15.0 minutes per visit, versus 15.7 minutes among urban physicians.

#### Discussion

To design graduate medical education curricula that adequately prepare primary care physicians for rural practice, differences in demographics, patients' present-

Table 4

Top 20 Patient Reasons for Visit, by Location of Physician and Rural Rank Order, 1996–1997

| <i>Reason for visit</i>           | <i>% Rural Visits</i> | <i>Rural Rank</i> | <i>% Urban Visits</i> | <i>Urban Rank</i> |
|-----------------------------------|-----------------------|-------------------|-----------------------|-------------------|
| General medical examination       | 6.6                   | 1                 | 8.8                   | 1                 |
| Cough                             | 5.1                   | 2                 | 5.6                   | 2                 |
| Progress visit, NOS               | 3.6                   | 3                 | 2.9                   | 6                 |
| Symptoms referable to the throat  | 3.2                   | 4                 | 4.1                   | 4                 |
| Blood pressure test               | 2.5                   | 5                 | 1.7                   | 14                |
| Back symptoms                     | 2.5                   | 6                 | 1.8                   | 13                |
| Well-baby examination             | 2.1                   | 7                 | 4.3                   | 3                 |
| Skin rash                         | 2.0                   | 8                 | 2.2                   | 9                 |
| Hypertension                      | 1.9                   | 9                 | 2.2                   | 8                 |
| Earache or ear infections         | 1.9                   | 10                | 2.5                   | 7                 |
| Physical for school or employment | 1.8                   | 11                | 1.2                   | 17                |
| Medication, other and unspecified | 1.7                   | 12                | 1.2                   | 18                |
| Knee symptoms                     | 1.6*                  | 13                | 1.0                   | 22                |
| Head cold, URI                    | 1.6*                  | 14                | 1.9                   | 12                |
| Fever                             | 1.6*                  | 15                | 3.1                   | 5                 |
| Headache                          | 1.2*                  | 16                | 1.6                   | 15                |
| Stomach and abdominal pain        | 1.2*                  | 17                | 2.0                   | 11                |
| Chest pain and related symptoms   | 1.2*                  | 18                | 1.3                   | 16                |
| Low-back symptoms                 | 1.2*                  | 19                | .7                    | 30                |
| Diabetes mellitus                 | 1.1*                  | 20                | 1.1                   | 19                |

NOS—not otherwise specified

URI—upper respiratory infection

\* Estimate based on fewer than 60 observations; too small to be reliable

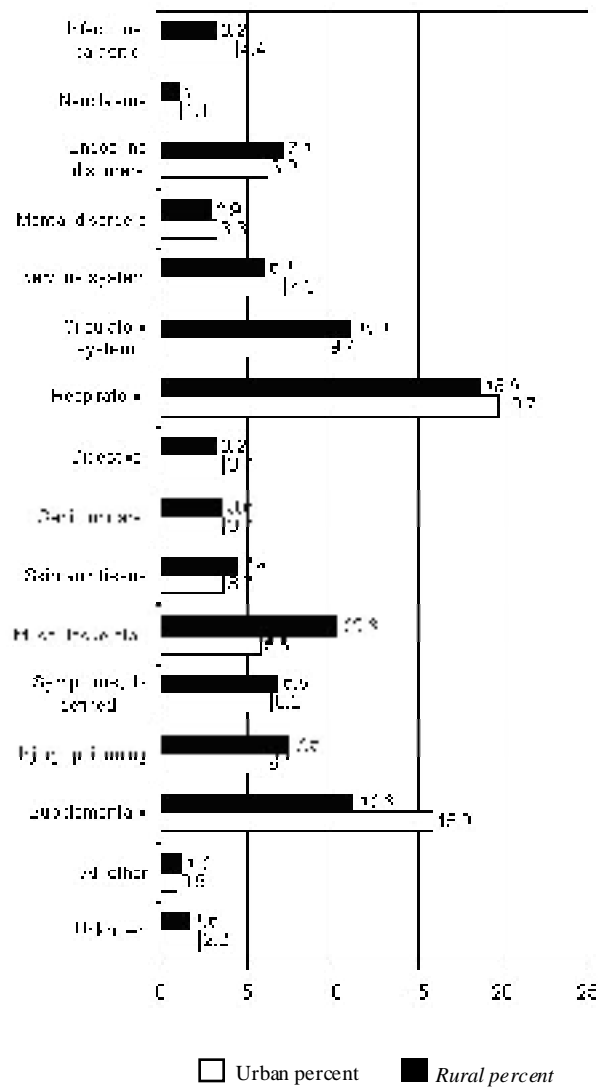
ing complaints, and visit frequency must be examined. While this information has been available for the inpatient setting, to date, a comprehensive national analysis has not been available for ambulatory visits in rural, as compared to urban, practices. Since the majority of primary care providers in rural areas are family physicians, such information has particular relevance for family medicine educators.

Patients entering rural physicians' offices sampled by NAMCS in 1996 and 1997 were older than their urban counterparts and more likely to be white. Visits for acute care and injury were more frequent in rural areas, and preventive care was more commonly reported to be incorporated in the office visits of urban physicians. Rural family physicians provided more care to children than their counterparts in urban areas. We found few differences in the diagnostic content of visits made to primary care physicians in rural versus urban practices. Acute respiratory infections and related infections, hypertension, and diabetes were common in both locales.

While the rural population increased by 3.6% between 1980 and 1990, the proportion of all primary care physician visits taking place in rural areas decreased from 33% in 1978 to 19% in 1994.<sup>13</sup> It has been suggested that at the national level, specialties outside the traditional primary care fields provide primary care

Figure 1

Distribution of Visits Across All Diagnostic Categories, Based on Reported Principal Diagnosis



services,<sup>14</sup> for example, obstetrician-gynecologists serving as primary caregivers for women.<sup>15</sup> While expansion in the provision of primary care services may be occurring in urban areas, most rural areas lack specialists to replace primary care physicians in the provision of services. In rural areas, family physicians continue to be the mainstay of ambulatory care. In the 1996–1997 data examined in this study, family physicians provided three of every five rural primary care office visits.

Children's Health

Family physicians planning to practice in rural areas must be adequately trained in children's health. We found that over the 2-year period of 1996–1997, family physicians provided more than half (53%) of all care to children ages 14 or younger in rural areas; this situation is unlikely to change in the near future. While the number of pediatricians in the American Medical Association Physician Masterfile increased 49% between 1981 and 1996, for example, ratios of pediatricians per child in rural areas increased only 4.1%. The majority (84.4%) of counties with a population below 25,000 lacked a pediatrician.<sup>16</sup> In this context, the relatively low rates of provision of anticipatory guidance for children by rural versus urban practitioners found by this study is cause for concern. Family practice training programs that prepare graduates for rural areas need to provide greater emphasis on care of infants and children than do urban-focused programs.

Preventive Services

The provision of clinical preventive services for adults may also be a problem in rural areas. Counseling regarding diet, exercise, tobacco, and injury prevention occurred in proportionately fewer office visits in rural settings. Similarly, patient visits in these prac-

Table 5

Top 20 Diagnoses Associated With Ambulatory Visits, by Rural Versus Urban Location of Physician

| Schneeweiss Cluster                 | Rural   |      | Urban   |      |
|-------------------------------------|---------|------|---------|------|
|                                     | Percent | Rank | Percent | Rank |
| Acute URI                           | 7.8     | 1    | 9.2     | 2    |
| General medical examination         | 7.5     | 2    | 12.7    | 1    |
| Hypertension                        | 7.0     | 3    | 6.9     | 3    |
| Diabetes mellitus                   | 3.5     | 4    | 2.9     | 7    |
| Acute lower respiratory infection   | 3.4     | 5    | 3.3     | 5    |
| Sinusitis                           | 2.9     | 6    | 3.2     | 6    |
| Lacerations, contusions             | 2.6     | 7    | 1.9     | 10   |
| Degenerative joint disease          | 2.5     | 8    | 1.3     | 15   |
| Otitis media                        | 2.5     | 9    | 4.4     | 4    |
| Acute sprains, strains              | 2.5     | 10   | 2.5     | 8    |
| Depression, anxiety, neuroses       | 2.3     | 11   | 2.4     | 9    |
| Low-back pain                       | 2.0     | 12   | 1.1     | 20   |
| Emphysema, chronic bronchitis, COPD | 1.6*    | 13   | .7      | 28   |
| UTI                                 | 1.6*    | 14   | 1.2     | 16   |
| Fibrositis, myalgia, arthralgia     | 1.5*    | 15   | 1.0     | 22   |
| Chronic rhinitis                    | 1.5*    | 16   | 1.3     | 13   |
| Ischemic heart disease              | 1.4*    | 17   | 1.4     | 12   |
| Bursitis, synovitis                 | 1.4*    | 18   | .9      | 24   |
| Peptic diseases                     | 1.3*    | 19   | 1.2     | 17   |
| Dermatitis and eczema               | 1.3*    | 20   | 1.3     | 14   |
| No information                      | 12.4    |      | 12.1    |      |

\* Estimate based on fewer than 60 observations

UTI—urinary tract infection

tices were less likely to include cholesterol screening, urinalysis, or breast screening. These findings were not a coding artifact stemming from use of the principal diagnosis alone for analysis of clinical content because information on preventive activities was obtained through a separate item on the NAMCS survey.

Further research is needed to ascertain whether the reduced provision of preventive counseling and services is a function of the population served in rural areas or represents a real quality differential between urban and rural practices. Alternative explanations can be hypothesized. First, the lower proportion of general medical examinations and higher proportion of visits for acute illness, injury, and pain among rural practices may provide fewer opportunities for physicians to offer preventive counseling and services. Second, time constraints may reduce the provision of "nonessential" services in rural areas. However, our data suggest only a small difference in length of time between rural and urban visits. Further, whether short visit times eliminate preventive services, or whether the absence of preventive services shortens visit times, cannot be ascertained from the NAMCS data. A survey of family practice residencies with a rural mission, however, found that most believe that they do not teach the utilization of paraprofessionals well, which may influence physician time management practices.<sup>17</sup> Greater emphasis

in building systems of care within a practice and within a community is needed in all family practice training programs but especially for those residents who are destined for rural practice. Finally, provision of preventive counseling and services may be hampered by the larger portion of rural visits funded by Medicare and Medicaid.

#### Payment System

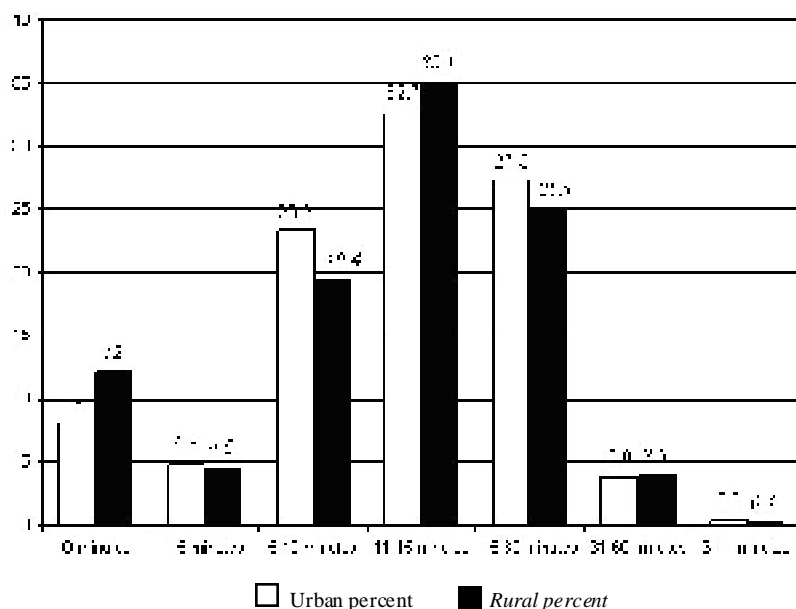
Differences in the principal source of payment between rural and urban practitioners deserve comment. While little managed care was present in rural areas, the reimbursement situation was still a problem for rural physicians, compared with their urban peers. The dependence of rural practitioners on federal and state programs (Medicare, Medicaid) for funding was high, meaning that policy decisions concerning these programs disproportionately affect rural physicians. With the Centers for Medicare and Medicaid Services moving to an outpatient prospective payment system based on ambulatory payment classifications,<sup>18</sup> rural physicians as well as hospitals could ultimately be affected. The current payment system for hospital-based ambulatory services is complex and subject to quarterly modifications,<sup>19</sup> potentially making it more difficult for rural physicians to obtain adequate reimbursement for these services.

#### Limitations

Our study has several limitations. First, the metropolitan statistical area versus non-metropolitan statistical area distinction is not the best possible definition of "rural,"<sup>20</sup> although it was the only definition possible based on the NAMCS sampling frame. A three-part division of counties into urban, rural but adjacent to metropolitan areas, and totally rural might have produced a sharper delineation of rural differences. For example, the proportion of all rural visits made to family physicians might have been higher had physicians in rural/adjacent counties been excluded. Second, some primary care is provided by specialist physicians, so our exclusion of other specialties in the analysis may limit the picture of rural health care.<sup>21</sup> Third, it must be noted that our analysis of diagnostic content is based on principal diagnosis only. Estimates of comorbidity are not provided. Fourth, because the NAMCS sample only includes individuals who visit physicians' offices, it is not a good source for understanding patient behavior.

Figure 2

Percent of Physicians Who Reported Spending Indicated Time Intervals With Patients, by Urban Versus Rural Location of Physicians' Office



Our findings suggest, but do not explain, possible differences in patient use of physician services. Previous research has found that rural residents are less likely to report having a source of health care and are less likely to seek care.<sup>22</sup> In the NAMCS data reported here, proportionately fewer rural visits in 1996–1997 were for general preventive purposes, such as a general medical examination. Conversely, approximately one in every seven rural visits (14.6%) involved an injury or a chronic condition likely to be associated with pain, versus only 10.4% of urban visits. These findings would be consistent with both lower access to care and a higher threshold for seeking care.

Finally, there may be a bias in using physician office visits to assess ambulatory care. Both rural and urban residents may also seek care from hospital emergency departments or hospital outpatient departments.<sup>23</sup>

### Conclusions

The content and process of today's family practice residency programs encompass the range of diagnostic problems the rural physician will encounter. However, programs that train residents primarily for rural settings will need to provide additional exposure to experiences in pediatric care, including both acute problems and well visits with anticipatory guidance. Also needed is attention to injury management, chronic pain management, and appropriate clinical preventive services among all populations. A key element to be addressed is the role of, and reimbursement for, education and preventive services for rural populations within rural practices. Physicians intending to enter rural practice may benefit from greater utilization of physician extenders and development of systems of care within the community for these services.

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