

4-2024

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Recommended Citation

Ziller E, Milkowski C, Croll Z, Jonk Y. Non-urgent use of emergency departments by rural and urban adults. University of Southern Maine, Muskie School, Maine Rural Health Research Center;2024. PB-81.

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Non-Urgent Use of Emergency Departments by Rural and Urban Adults

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BACKGROUND

Hospital emergency departments (EDs) serve a vital role in the US health care system, providing lifesaving, around-the-clock care to patients in acute health situations. However, use of the ED for non-urgent care is costly and reflects a suboptimal care setting. Though definitions and estimates of non-urgent ED use vary widely, systematic literature reviews estimate that approximately one-third of ED visits are for non-urgent reasons.^{1,2}

A 2019 analysis estimated that avoidable ED visits cost the US health care system approximately \$32 billion each year.³ The same analysis found that primary care treatable conditions cost 12 times more when treated in an ED than at a physician's office.³ According to estimates, reducing avoidable ED visits by caring for non-urgent patients with chronic conditions in more appropriate ambulatory care settings (e.g., through improved care coordination/management and delivery of preventive services) could save the health sector as much as \$8.3 billion annually.⁴

In addition to increasing health care costs, use of the ED for routine ambulatory care can affect care for both the non-urgent patient and others in the ED. For example, inappropriate use of the ED has been associated with reduced care coordination and quality of care,⁵ and overcrowding in the ED,⁶ which in turn could lead to poorer outcomes.^{6,7} One analysis found that, in caring for three common non-urgent ailments (earache, sore throat, and UTIs), EDs scored significantly lower on quality measures than retail clinics, physician offices, or urgent care.⁸ Further, ED crowding has been associated with an increase in medication errors.⁹

Research indicates that rural residents use the ED in general at higher rates than their urban counterparts in general,¹⁰⁻¹² and that this difference has increased over time. From 2005-2016, ED use in rural areas increased more than 50%, while rates in urban areas remained relatively stable.¹⁰ The increase was particularly pronounced among young adults, the uninsured, and individuals with Medicaid, leading the authors to conclude that the increase could be associated with higher rates of acute illness among low-income rural populations, poorer capacity of rural health systems to meet their health care needs, or both.

Findings on rural-urban differences in non-urgent ED use have been mixed. Several studies have found that rural residents have higher rates of non-urgent ED use than urban residents.¹³⁻¹⁵ In contrast, a 2010-11 analysis of ED use among Medicaid beneficiaries in Tennessee found that the percentage of ED visits that were non-urgent was

Key Findings

- Rural adults aged 18 to 64 are more likely than their urban counterparts to visit the emergency department in a given year (16% versus 13%).
- Among all adults in this age group, 5% of those in rural places have used the ED for non-urgent reasons compared with 4% of those living in urban places.
- Socio-demographic characteristics associated with higher rates of non-urgent ED use by rural residents include younger age, fair or poor mental and physical health, low income, public insurance coverage, and lower access to primary care.

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identical for rural and urban residents.¹⁶ A recent analysis by AHRQ indicates that increased rurality is associated with increased likelihood of using the ED as a usual source of care.¹⁷ Some of these studies are limited by the age of the data or based on a single state.

In addition to needing updated information on non-urgent ED use among rural versus urban residents, it is important to understand what factors are associated with non-urgent use of EDs in rural areas. Prior studies suggest that non-urgent ED use may be influenced by people's socioeconomic circumstances or the health care system characteristics in their communities, including factors that are more pronounced in rural versus urban areas. For example, non-urgent ED use has been associated with lower income, being uninsured, and being covered by Medicaid,¹⁸ each of which is more prevalent among rural populations. Non-urgent ED use may also be related to lower health literacy, which is associated with less formal education, or it could reflect primary care access barriers, including availability of after-hours care.

This study provides updated information and addresses gaps in knowledge about rural non-urgent ED use. Understanding the rates of non-urgent ED use among rural adults and the factors associated with this use can inform policy and practice efforts to reduce inappropriate use of EDs in rural communities.

METHODS

We examined differences in non-urgent ED use between rural and urban adults aged 18 to 64 using the 2014-2017 Medical Expenditure Panel Survey (MEPS). The study addressed the following research questions:

1. What percentage of rural and urban adults visit the ED for a non-urgent reason? And,
2. What socioeconomic and health care access factors are associated with non-urgent ED use among rural residents?

Data: The MEPS is a nationally representative survey containing data on the demographics, medical conditions, and health service use of the non-institutionalized US population. At the time we initiated the study, the 2017 dataset was the most recent year available. To examine ED use among survey respondents, we joined the MEPS Emergency Room Visits files to the corresponding Full-Year Consolidated Data file for each study year. Because MEPS does not include a publicly available rural-urban identifier, we accessed the restricted data

through the Agency for Healthcare Research and Quality (AHRQ) Data Center. Our study examined ED use among adults aged 18 to 64 (n=68,682).

Dependent variables: The dependent variable in our study was non-urgent use of the ED. Following methods described in previous studies,^{19,20} we categorized an individual as having a non-urgent visit if they used the ED and that visit was not reported by the patient to be an emergency, did not result in a hospital admission, and the patient did not receive a surgical procedure or imaging (X-rays, magnetic resonance imaging scan, computed axial tomography scan, electrocardiogram, or electroencephalogram).

Independent variables: The independent variable in our study was rural-urban county residence. Using the 2013 Urban Influence Codes, we categorized individuals living in large and small metropolitan counties as urban, and those living in micropolitan and non-core counties as rural.

Covariates: We included the following respondent characteristics as study covariates: age, gender, race and ethnicity, health status (physical health, mental health, and chronic conditions), income as percentage of the federal poverty level (FPL), and insurance status. Given that rural residents experience barriers to health care access that may impact ED use, including more limited availability of after-hours and weekend care than urban residents,²¹ we also included a measure of usual source of care (USC) access. We defined high-level USC access as having a USC that was 1) less than 30 minutes away, 2) had night or weekend hours, and 3) was not difficult to contact by phone. Respondents with a USC who reported two out of three USC access indicators were categorized as having mid-level access, and those reporting one or none of the indicators were categorized as having low-level access. Respondents with no USC, or who reported that their USC was the ED were categorized as having no USC access.

Analysis: We compared rural and urban ED use generally and for non-urgent reasons using bivariate Chi-square tests. To further understand the factors contributing to rural and urban non-urgent ED use, we used logistic regression to estimate rural and urban odds of non-urgent ED use, controlling for the covariates listed above. For these analyses, we excluded ED users with a documented emergency so that we were comparing individuals without health emergencies who used the ED versus those who did not, yielding a regression sample size of 61,850 people. We conducted all analyses using survey procedures and weights in SUDAAN version

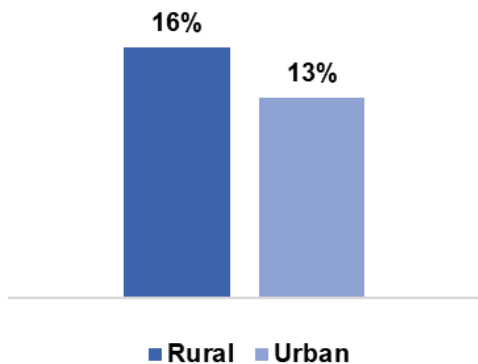
11.0.3 (RTI International, Research Triangle Park, NC) to address complex sampling in the MEPS.

FINDINGS

Rural adults aged 18 to 64 were more likely than their urban counterparts to have at least one ED visit over the course of a year. Sixteen percent of rural working-age adults had an ED visit compared with 13% of those living in urban counties (Figure 1). Among all adults who used the ED, 24% used it for not-urgent reasons, a rate that did not differ based on rural versus urban residence (data not shown).

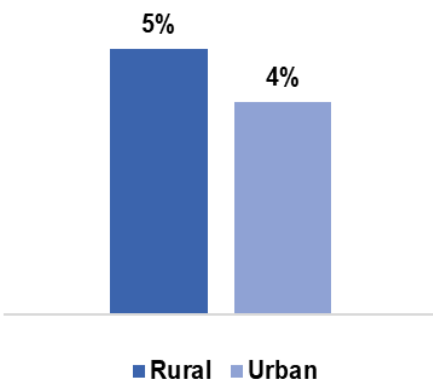
When examining population level rates of non-urgent ED use, we found that 5% of all rural adults used the ED for a reason that would not be considered an emergency based on our definition (Figure 2). This compared with a somewhat lower rate, but statistically significant difference, for urban adults (4%).

Figure 1: Percentage of Adults (18-64) with any Emergency Department Visit



SOURCE: 2014-17 Medical Expenditure Panel Survey.
NOTE: Rural-urban differences significant at $p < .05\%$.

Figure 2: Percentage of Adults (18-64) with a Non-Urgent Emergency Department Visit



SOURCE: 2014-17 Medical Expenditure Panel Survey.
NOTE: Rural-urban differences significant at $p < .05\%$.

To understand the factors associated with non-urgent ED use in rural areas, we examined rates of use among rural residents for a series of socio-demographic characteristics (Figure 3). We found that the percentage of non-urgent ED visits was somewhat higher among adults aged 18 to 34 than for those aged 35 to 64 (6% versus 4%). Adults in fair or poor mental health were three times more likely to have non-urgent ED visit than those in excellent or very good health (12% versus 4%). This pattern held true for physical health as well, with rural residents who were in fair or poor health being more likely to have a non-urgent ED visit. People who had low income (less than 100% FPL) and public insurance coverage (Medicare or Medicaid) were more likely to have a non-urgent ED visit than rural adults with higher income or private health insurance.

Finally, adults who reported low access to primary care (e.g., they didn't have a usual source of care or couldn't schedule visits or contact their primary care offices by phone on nights or weekends) were more likely to have a non-urgent ED visit.

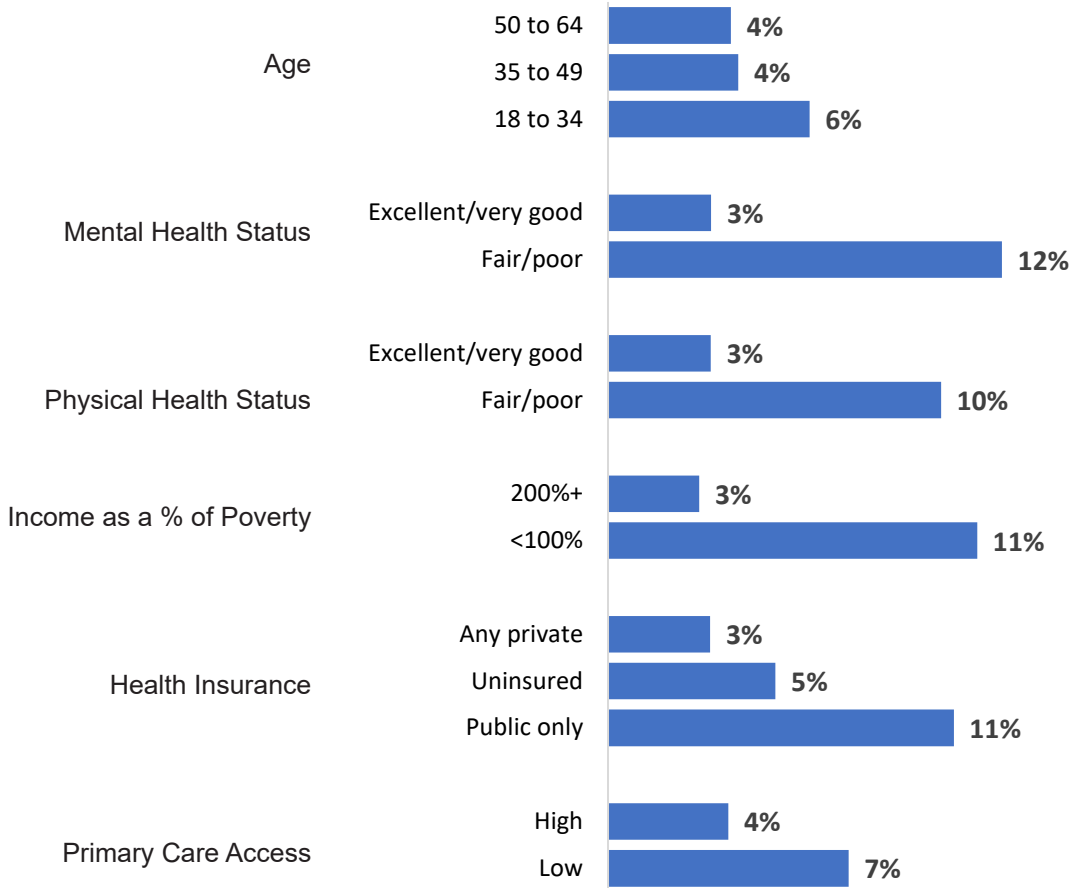
Using multivariable analysis we examined the unadjusted odds of rural working-age adults visiting the ED for a non-urgent reason compared with their adult counterparts. We found that rural residents had 22% higher odds (chances) of visiting the ED for a non-urgent reason than urban residents. When we adjusted for the health and socio-demographic characteristics of working-age adults, the rural odds of a non-urgent ED visit attenuated to non-significant. In other words, once we controlled for rural-urban differences in the characteristics of non-elderly adults, rural residents were no longer at higher odds of a non-urgent ED visit.

DISCUSSION & POLICY IMPLICATIONS

The use of EDs for non-urgent care is a health policy concern as it may result in higher health care costs and reduced care coordination and quality of care. This study provides updated information on rural non-urgent ED use and the characteristics of people using the ED for non-urgent reasons. We found that rural residents were more likely to have at least one ED visit compared with urban residents, and 5% of rural adults used the ED for non-urgent reasons versus 4% of their urban counterparts.

We also found several socio-demographic characteristics that were associated with non-urgent ED use in rural areas. These include younger age, fair or poor mental and physical health, low income, public insurance coverage, and lower access to primary care. The findings of this study highlight

Figure 3: Percentage of Rural Adults (Aged 18 to 64) with a Non-Urgent Emergency Department Visit by Characteristics



SOURCE: 2014-17 Medical Expenditure Panel Survey.
 NOTE: All differences in NUED use by characteristic significant at p. < .05%.

Table 1: Unadjusted and Adjusted Odds of Having a Non-Urgent ED Visit among Rural Versus Urban Adults (Ages 18-64)

	OR	95% CI	
Unadjusted Odds of Non-Urgent ED Use			
Urban (referent)	1.00	1.00	1.00
Rural*	1.22	1.02	1.46
Adjusted Odds of Non-Urgent ED Use^a			
Urban (referent)	1.00	1.00	1.00
Rural ^{NS}	0.97	0.82	1.15

Note: Adults whose ED visit was categorized as an emergency based on our criteria are excluded from these models.
 *Rural-urban differences in the unadjusted model was significant at p<.0001.
^aAdjusted for gender, age, race/ethnicity, health status, health insurance coverage, region, and self-reported access to health care.
 SOURCE: 2014-17 Medical Expenditure Panel Survey

the need for policy and practice efforts to address the factors that contribute to non-urgent ED use in rural communities.

Across the U.S., ED visits related to medical conditions, substance use, or mental health represent a growing proportion of overall ED visits, while the proportion of injury related ED use has been on the decline.²² In rural areas, a number of factors are likely contributing to increasing use of the ED for reasons other than injury. Compared with urban populations, rural residents tend to be older and in poorer health.²³ Poor rural access to dental care²⁴ may also be a factor in higher rural ED visit rates.²⁵ Non-traumatic dental visits to the ED comprise an estimated 2% of all ED visits,²⁶ and rural rates of ED visits for dental conditions are higher than urban rates.²⁷

The role between public insurance and non-urgent ED use is likely to be complicated. On the Medicare side, the population included in this study (adults aged 18 to 64) is comprised of individuals with documented, long-term disabilities. Thus, they may have complex health care needs that could result in higher use of the ED in general. Several studies have found that gaining Medicaid coverage after being uninsured is associated with an increase in ED use, possibly because (like any health insurance) it improves access to all services.^{28,29} However, other research suggests that Medicaid coverage may increase access to other outpatient care, thereby reducing non-urgent ED visits. For example, a recent study using 2012 to 2017 National Health Interview Survey data found that Medicaid expansion was not associated with significant changes in ED use, and actually led to a decrease in ED visits that were associated with access barriers.³⁰

Our study suggests that poorer access to primary care may be associated with rural residents' non-urgent ED use. Those living in rural places face more barriers to accessing primary care, including fewer primary care providers per capita,³¹ longer travel times to access care,³² greater difficulty contacting providers after hours,³³ and higher rates of uninsurance.³⁴ Thus, reducing these barriers to primary care may also reduce non-urgent ED use.

Improving the availability of after-hours care may ensure that rural residents have access to services when they might otherwise use the ED. In addition, educational campaigns aimed at increasing health literacy among rural residents may help them better understand the appropriate use of EDs and how to access the right type of care for their needs. Innovations such as the "discharge to medical home" model have been shown to reduce

inappropriate ED use in rural settings by screening patients for severity and booking same-day (next available) appointments at an adjoining primary care clinic for patients who do not require ED admission.³⁵ Similarly, the expansion of telehealth consults during the COVID-19 public health emergency may have aided in reducing non-urgent ED use in both rural and urban areas. Given that these analyses reflect the pre-COVID era, more research is needed to understand the relationship between telehealth and avoided ED use.

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This study was supported by the Federal Office of Rural Health Policy (FORHP), Health Resources and Services Administration (HRSA), U.S. Department of Health and Human Services (HHS) under cooperative agreement #U1CRH03716. The information, conclusions and opinions expressed in this brief are those of the authors and no endorsement by FORHP, HRSA, or HHS is intended or should be inferred.