

## Rural and Urban Utilization of the Emergency Department for Mental Health and Substance Abuse

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### Introduction

Overall, an estimated 43.4 million adults in the U.S. had any mental illness in 2015; 15.1 million were diagnosed with alcohol abuse.<sup>1</sup> In 2007, the Agency for Healthcare Research and Quality (AHRQ) reported that 12.5% of all Emergency Department (ED) visits were related to mental health or substance abuse (MH/SA) (based on all-listed diagnoses).<sup>2</sup> Of those 95 million MH/SA ED visits, 4.1 million had MH/SA as the primary diagnosis.<sup>2</sup> While research has identified general utilization and cost of emergency services for MH/SA care, little research specifically addresses rural utilization, and rural populations at greater risk of utilizing the ED for a MH/SA diagnosis. Utilizing data from the Healthcare Cost and Utilization Project's (HCUP's) State Emergency Department Databases (SEDD) for seven states, researchers explored, and describe in this brief, the use of the ED for MH/SA among Urban, Large Rural, Small Rural, and Isolated Small Rural residents. The proportion of ED visits with a primary MH/SA diagnosis increased nationally. While results indicate that utilization is lower among the more rural U.S. residents, individuals utilizing the ED for MH in rural communities share different characteristics than those in urban areas, which subsequently may impact cost of care, and proposed interventions.

### Key Findings

- Overall in 2013, 14.6% of all ED visits were for a primary MH/SA diagnosis.
- 15.1% of all Urban residents' ED visits were for MH/SA diagnoses compared to 12.0%, 12.2%, and 11.0% of Large Rural, Small Rural, and Isolated Small Rural respectively.
- Large Rural, Small Rural, and Isolated Small Rural residents who presented to the ED for a MH/SA diagnosis were more likely than Urban residents to present with a primary diagnosis of mental health disorder. Among Urban residents presenting to EDs, 70.7% of all MH/SA visits carried a primary diagnosis of mental health disorder compared to 75.5%, 75.8%, and 75.7% of Large Rural, Small Rural, and Isolated Small Rural residents.
- Urban residents presenting to the ED with a MH/SA diagnosis were more likely than rural residents to report a primary diagnosis of SA.
- Large Rural (58.4%), Small Rural (62.3%), and Isolated Small Rural (62.1%) residents presenting to the ED with a primary diagnosis of MH/SA were more likely to be on public insurance than Urban residents (48.0%).
- The proportion of ED patients presenting with a MH/SA diagnosis age 65 and older was higher in the more rural communities. Among Urban MH/SA ED patients, 18.2% were 65 years of age and older compared to 22.3%, 26.4%, and 27.9% of Large Rural, Small Rural, and Isolated Small Rural respectively.

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## Background

During the last 30 years, mental health and substance abuse (MH/SA) inpatient treatment has shifted from free-standing private or government hospitals to short-term general hospitals; however, the number of community short-term hospitals with dedicated psychiatric units declined from 1,571 in 1990 to 1,149 in 2014.<sup>3-4</sup> There is growing concern about both the increase in need for MH/SA inpatient treatment alongside the decrease in services, as well as the percent of MH/SA patients who gain entry into the hospital through the ED.

For nearly two decades, the number of patients in the U.S. with MH/SA diagnoses treated in the ED has been on the rise.<sup>5-6</sup> Previous reports exploring MH/SA ED utilization however are outdated, and rarely address variability between levels of rural. Articles that do address geography primarily focus on metro/non-metro comparisons. These classifications do provide some understanding on the impact of geography on health, but they do not account for the variability between Large Rural, Small Rural, and Isolated Small Rural communities. When the data permit, it is important to determine if characteristics of large rural communities are more in-line with urban than other rural categories.

ED directors have reported that MH/SA patients who present at the ED have increased ED boarding times (time between ED admit to ED departure), require resource-intensive care, impact the quality of care for other ED patients,<sup>7</sup> and are at an increased risk of readmission.<sup>8</sup> Additionally, individuals who use ED services multiple times a year for MH diagnoses are more likely to be uninsured.<sup>9</sup>

While research has explored ED readmissions, costs, referral patterns, and quality of care for patients presenting with MH/SA, little research has discussed the prevalence of rural MH/SA patients' reliance on emergency care. However, it is known that there are rural-urban disparities in mental health provider supply that include psychiatrists, clinical psychologists, psychiatric nurse practitioners, licensed social workers, and counselors (to include addiction, pastoral, school, professional, marriage and family, among others).<sup>10</sup> This study addresses rural-urban utilization of the ED for MH/SA diagnoses, while also describing the unique attributes of rural MH/SA ED patients in an effort to develop population-specific solutions.

## Methods

Data for this study were obtained from the AHRQ's Healthcare Cost and Utilization Project (HCUP). Data were gathered from the State Inpatient Database (SID) and State Emergency Department Database (SEDD) for calendar year 2013. States included were Arizona, Iowa, Kentucky, New Jersey, North Carolina, Vermont, and Wisconsin, pulling from all four Census Bureau Regions. States selected for inclusion had to meet the following specifications: availability of both SID and SEDD files for 2013; representation in Isolated Small Rural, Small Rural, Large Rural, and Urban geographic categories; evenly represent the four Census Bureau Regions; and include the variables of study in both the SID and the SEDD files.

Variables studied included patient ZIP code, patient age, patient gender, patient race, payer type, diagnosis codes, and discharge status. Patient ZIP codes were linked to the Rural-Urban Commuting Areas (RUCAs) and were aggregated into four categories including Urban, Large Rural, Small Rural, and Isolated Small Rural.<sup>11</sup> Urban areas are those areas with populations of 50,000 or greater and their adjacent high commuting areas. Large Rural areas are those areas with 10,000 to 49,999 population and their adjacent high commuting areas. Small Rural areas are those areas with 2,500 to 9,999 population with and low commuting patterns. Isolated Small Rural areas are those areas with less than 2,500 persons and low-volume commuting patterns. The International Classification of Diseases, Ninth Revision, Clinical Modification codes (ICD-9 codes) for mental health (ICD-9 diagnosis codes 290.99 – 293.0, 302.99 – 305.00, 305.19 – 305.30, 305.89 – 306, 648.29 – 648.4) and substance abuse (ICD-9 diagnosis codes 294.99 – 303.00, 305.99 – 315.00, 648.39 – 648.50) were included; those codes for Alzheimer's Disease and dementia were excluded. Previous reports completed by AHRQ utilizing HCUP data recommended removing dementia and intellectual disability/development disorders because these diagnoses frequently require more medical than psychiatric interventions, and are characterized by the development of multiple cognitive impairments.<sup>2</sup>

Emergency department visits meeting the diagnostic criteria were analyzed for statistically significant differences between genders, age categories, and payer types. Because of the large number of cases (11,129,457 ED visits with 1,352,156 ED visits for MH/SA diagnoses), statistical differences

**Table 1. Patient Demographics for those Presenting to ED with Primary MH/SA Diagnoses, 2013**

	Urban			Large Rural			Small Rural			Isolated Small Rural		
	% of all ED Visits	% of all ED MHSA Visits		% of all ED Visits	% of all ED MHSA Visits		% of all ED Visits	% of all ED MHSA Visits		% of all ED Visits	% of all ED MHSA Visits	
	MHSA	MH	SA	MHSA	MH	SA	MHSA	MH	SA	MHSA	MH	SA
<b>% of ED Visits</b>	15.1%	70.7%	20.4%	12.0%	75.5%	17.9%	12.2%	75.8%	17.7%	11.0%	75.7%	17.7%
<b>Female</b>	61.0%	82.6%	10.8%	62.9%	84.9%	10.1%	61.5%	85.7%	09.5%	62.1%	84.5%	10.4%
<b>Age, in years</b>												
<b>18-44</b>	49.4%	45.8%	57.4%	46.2%	42.5%	57.1%	43.0%	38.6%	55.9%	41.7%	36.6%	57.1%
<b>45-64</b>	32.4%	30.4%	37.7%	31.5%	30.0%	36.1%	30.6%	28.8%	37.1%	30.4%	29.2%	34.6%
<b>65+</b>	18.2%	23.8%	04.9%	22.3%	27.5%	06.8%	26.4%	32.6%	07.0%	27.9%	34.3%	08.3%
<b>Primary Payer</b>												
<b>Medicare</b>	28.6%	34.9%	11.5%	36.3%	42.0%	17.7%	39.5%	45.7%	18.7%	39.8%	46.1%	19.4%
<b>Medicaid</b>	19.4%	19.5%	17.5%	22.1%	21.5%	22.9%	22.8%	21.2%	26.5%	22.3%	21.0%	25.3%
<b>Private</b>	24.3%	25.8%	20.6%	18.1%	18.5%	17.4%	17.4%	17.8%	16.7%	17.7%	17.8%	18.1%
<b>Uninsured</b>	25.2%	17.2%	47.8%	21.0%	15.8%	38.4%	17.7%	13.2%	32.9%	17.8%	13.0%	33.1%
<b>Other</b>	02.5%	02.5%	02.5%	02.5%	02.2%	03.6%	02.6%	02.0%	05.2%	02.5%	02.1%	04.1%
<b>N</b>	1,352,156	955,566	275,461	126,011	95,158	22,500	74,495	56,489	13,195	44,528	33,724	7,888

between estimates were nearly always significant. All differences between geographic categories as listed in text are statistically significant at  $p < 0.05$  or better. Differences between geographic categories were also deemed meaningful through analyses of two-by-two comparisons, calculating confidence intervals.

## Findings

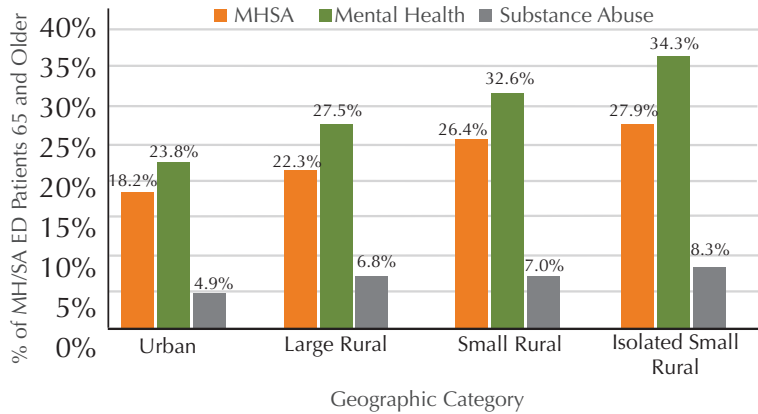
The Agency for Healthcare Research and Quality reported that in 2007, 12.5% of ED visits involved a diagnosis related to MH/SA.<sup>2</sup> Utilizing the same dataset for seven selected states in 2013 identified 14.6% of ED visits (all location types combined) with a primary MH/SA diagnosis. Compared to a previous report, the overall utilization of the ED for MH/SA has increased. However, in 2013 Large Rural, Small Rural, and Isolated Small Rural residents were not more likely than their Urban counterparts to utilize the ED for MH/SA, as had been hypothesized. See Table 1. Percentage of MH and SA visits will not equal 100%; omitted from the table are those ED visits where the individual presented with co-occurring MH and SA.

Urban MH/SA ED visits were more likely to be related to SA (20.4% of all MH/SA visits) than Large Rural (17.9%), Small Rural (17.7%), or Isolated Small Rural cases (17.7%). Conversely, rural residents presenting with MH/SA were more likely than Urban patients to present with a primary MH diagnosis (70.7% versus 75.5%, 75.8%, and 75.7%). See Table 1.

Across all geographic categories, patients age 18-44 made up the largest proportion of MH/SA ED visits, followed by those 45-64, and finally those age 65 and older. However, a higher proportion of rural residents had MH diagnoses than urban residents in the 65 years of age and older category. Only 18.2% of all urban MH/SA ED patients were 65+ years of age compared to 22.3%, 26.4%, and 27.9% of Large Rural, Small Rural, and Isolated Small Rural residents respectively. See Figure 1. While the percentage of patients 65 and older presenting with either MH or SA increased the more rural the patient's geography, this cohort predominantly presented with a MH diagnosis rather than SA.

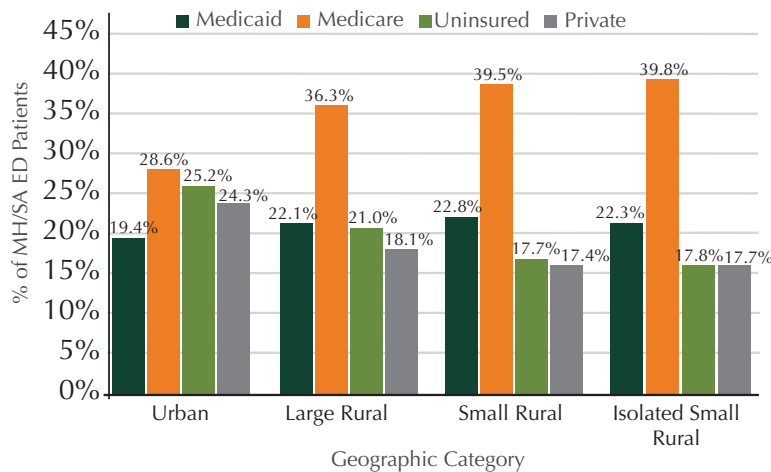
Compared to other age cohorts, those 65 and older across all geographies were far less likely to present to the ED for SA. See Figure 1.

**Figure 1. Percent of MH/SA ED Patients 65 Years of Age and Older by Geographic Category**

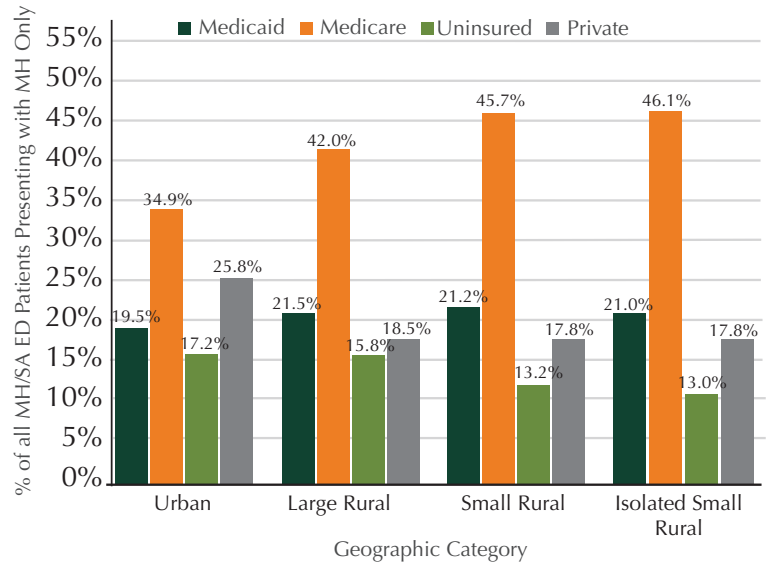


Rural residents presenting to the ED for MH/SA were more likely than urban residents to be on Medicare or Medicaid. Conversely, urban MH/SA ED patients were more likely to be on private insurance (24.3%) than Large Rural (18.1%), Small Rural (17.4%), or Isolated Small Rural residents (17.7%). The larger proportion of rural MH/SA ED patients covered by Medicare is substantiated by earlier data illustrating a larger population in those communities age 65 and older. See Figures 2-4.

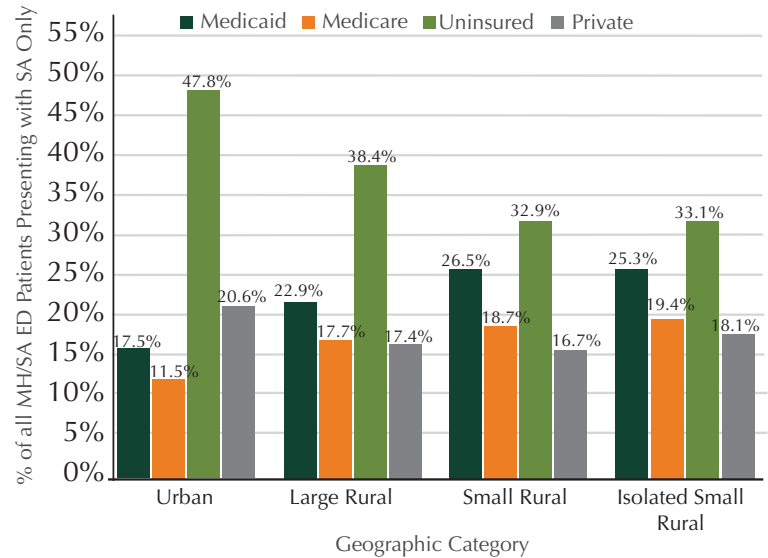
**Figure 2. Percent of all MH/SA ED Patients by Payer & Geographic Category, 2013**



**Figure 3. Percent of ED Patients with MH Only by Payer & Geographic Category, 2013**



**Figure 4. Percent of ED Patients with SA Only by Payer & Geographic Category, 2013**



## Discussion

The percent of MH/SA ED visits has been increasing in rural and urban communities alike. Rural residents were not disproportionately more likely than urban to present to the ED with a primary MH/SA diagnosis. However, EDs treating rural residents were more likely to see MH/SA cases age 65 and older, and more likely to provide MH/SA ED services for individuals who were publically insured (to include Medicaid and Medicare). Research has found that Medicaid patients experience more barriers to timely primary care, greater ED utilization, and higher readmission rates than their privately insured peers.<sup>9,12</sup> The current study indicates that EDs serving rural MH/SA patients could be well served to identify barriers to primary mental health care services for Medicaid enrollees (among others) in an effort to reduce ED utilization, and provide more appropriate and timely services. As hospitals, public health units, and communities work together to identify the social, and health needs of their residents, discussion can begin to focus on how to improve access and utilization of mental health and substance abuse services, especially in rural communities.

While urban residents, especially those presenting with SA, were more likely than any rural geography to be uninsured, they were also more likely to carry private insurance. However, uninsured adults have been reported as twice as likely as those privately insured to cite lack of access to other providers as their reason for their most recent ED visit.<sup>13</sup> The overall increase in utilization of the ED for MH/SA, as well as rural residents presenting more readily with MH than urban, may reflect inadequate access to outpatient MH services. Larson et al. reported a shortage in mental health provider supply for rural communities to include psychiatrists, clinical psychologists, psychiatric nurse practitioners, social workers, and counselors (addiction, pastoral, school, professional, marriage and family, among others).<sup>10</sup> In fact, only 3% of metropolitan counties (urban) were without any mental health provider compared to 13% of non-metro (rural) counties.<sup>10</sup> Addressing rural mental health provider shortages through workforce initiatives and innovative application of tele-mental health may reduce the utilization of the ED for MH among both rural and uninsured (rural and urban) individuals.

EDs treating Large Rural, Small Rural, and Isolated Small Rural residents were also more likely than EDs who

predominantly serve urban communities to treat MH/SA patients age 65 and older. These EDs could be well served to explore and develop community health services directed at preventing MH ED visits among this age cohort. It is also important that patients 65 and older have age-appropriate resources and referrals for addressing and treating MH diagnoses. Home health services, assisted living facilities, public health services, visiting nurses, meals on wheels, and other rural and elderly community health programs could be trained to recognize common mental health concerns among rural residents, addressing issues of depression and isolation in an effort to reduce the utilization of the ED for MH among rural elders.

This study explored the characteristics of rural patients presenting to the ED for MH/SA diagnoses. Future research should employ the same method to determine what impact, if any, the current opioid crisis has had on the proportion of rural residents utilizing the ED for SA. There is also interest in average readmissions for rural MH/SA ED patients, and the cost of providing mental health services in an ED compared to a primary mental health care setting.

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## Citations

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# Rural and Urban Utilization of the Emergency Department for Mental Health and Substance Abuse

## POLICY BRIEF

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## Additional Information

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