



ASPE
ASSISTANT SECRETARY FOR
PLANNING AND EVALUATION

OFFICE OF
HEALTH POLICY

REPORT TO CONGRESS

Trends in the Utilization of Emergency Department Services, 2009-2018

March 2, 2021

U.S. Department of Health and Human Services
Office of the Assistant Secretary for Planning and Evaluation

The Office of the Assistant Secretary for Planning and Evaluation

The Assistant Secretary for Planning and Evaluation (ASPE) advises the Secretary of the U.S. Department of Health and Human Services (HHS) on policy development in health, disability, human services, data, and science; and provides advice and analysis on economic policy. ASPE leads special initiatives; coordinates the Department's evaluation, research, and demonstration activities; and manages cross-Department planning activities such as strategic planning, legislative planning, and review of regulations. Integral to this role, ASPE conducts research and evaluation studies; develops policy analyses; and estimates the cost and benefits of policy alternatives under consideration by the Department or Congress.

The Office of Health Policy

The Office of Health Policy (HP) provides a cross-cutting policy perspective that bridges Departmental programs, public and private sector activities, and the research community, in order to develop, analyze, coordinate and provide leadership on health policy issues for the Secretary. HP carries out this mission by conducting policy, economic and budget analyses, assisting in the development and review of regulations, assisting in the development and formulation of budgets and legislation, and assisting in survey design efforts, as well as conducting and coordinating research, evaluation, and information dissemination on issues relating to health policy.

Suggested Citation

Office of the Assistant Secretary for Planning and Evaluation, U.S. Department of Health & Human Services. Trends in the Utilization of Emergency Department Services, 2009-2018. 2021.
<https://aspe.hhs.gov/pdf-report/utilization-emergency-department-services>

Acknowledgements

ASPE gratefully acknowledges staff in the Agency for Healthcare Research and Quality that provided data and assistance with interpretation of results for this report.

Table of Contents

The Office of the Assistant Secretary for Planning and Evaluation	1
The Office of Health Policy	1
Suggested Citation.....	1
Acknowledgements	1
Acronyms.....	3
Section 1: Introduction	4
Key Data Trends: 2009-2018.....	8
Section 2: Categorizing Utilization of Emergency Departments	11
Section 3: Data on Utilization of Emergency Departments	14
Section 4: Results of Analysis on Emergency Department Utilization	17
National Trends.....	18
Patient Characteristics.....	19
Hospital and Community Characteristics	22
Payer Trends.....	24
Geographic Trends.....	29
Hospital Type.....	31
Diagnoses.....	32
Section 5: Efforts to Discourage Overuse of Emergency Departments	34
Centers for Medicare & Medicaid Services.....	35
Substance Abuse and Mental Health Services Administration.....	39
Urgent Care Centers, Retail Clinics, and Health Centers	39
Section 6: Conclusions	41
Appendix	44
Data Sources	44
HCUP NEDS, SID, and SEDD	44
CDC Social Vulnerability Index	47
Supplementary Tables and Figures.....	49
Sample of Recent Reports on ED Utilization from HHS	57
Agency for Healthcare Research and Quality - HCUP.....	57
Agency for Healthcare Research and Quality – Medical Expenditures Panel Survey	57
Centers for Disease Control and Prevention	57
References	59

Acronyms

AHC	Accountable Health Communities
AHRQ	Agency for Healthcare Research and Quality
ASPE	Office of the Assistant Secretary for Planning and Evaluation
CCS	Clinical Classification Software
CCSR	Clinical Classification Software Refined
CDC	Centers for Disease Control and Prevention
CMS	Centers for Medicare & Medicaid Services
ED	Emergency department
EMS	Emergency medical services
EMTALA	Emergency Medical Treatment & Labor Act
ET3	Emergency Triage, Treat, and Transport model
FFS	Fee-for-service
HCUP	Healthcare Cost and Utilization Project
HHS	U.S. Department of Health and Human Services
MACPAC	Medicaid and CHIP Payment and Access Commission
NCHS	National Center for Health Statistics
NHCS	National Health Care Survey
NEDS	Nationwide Emergency Department Sample
SEDD	State Emergency Department Databases
SID	State Inpatient Databases
SVI	Social Vulnerability Index



ASPE
ASSISTANT SECRETARY FOR
PLANNING AND EVALUATION

OFFICE OF
HEALTH POLICY

Section 1: Introduction

Introduction

This Report to Congress responds to the Joint Explanatory Statement Regarding H.R. 1865, the Further Consolidated Appropriations Act, 2020:

Emergency Room Utilization—HHS is encouraged to submit a report that analyzes emergency room utilization at the State and national levels to be provided to the Committees no later than one year after enactment of this Act. The report should focus on non-emergency services while in the emergency room setting.¹

Potential overuse or inappropriate use of emergency departments (EDs) for non-emergent care has been a concern for many years. EDs are a large and important component of the health care system in the United States, both in terms of number of patients served and spending. Overall, there were over 143 million ED visits in 2018, and of these, more than 20 million ended in admission to the same hospital while over 123 million ended in a release (HCUP NEDS 2018). In 2017, over 18% of adults reported having visited an ED at least once in the past year (NCHS 2018). One analysis suggests ED visits accounted for approximately 12.5% (\$328.1 billion) of overall national health expenditures in 2010. Although treat-and-release visits make up the majority of ED visits, they are less expensive on average, accounting for an estimated 4.2% of the 12.5% of national health expenditures, compared with 8.3% for ED visits ending in admission (Galarraga and Pines 2016). The estimated average cost² of a visit (not adjusted for complexity of care) to the ED in the United States was \$530 in 2017, although this was higher for patients with Medicare as an expected payer (\$660 per visit), and those with private insurance as an expected payer (\$560 per visit) and lower for patients with Medicaid as expected payer (\$420 per visit) and those with self-pay or no charge (\$460 per visit) (Karaca and Moore 2020). The average cost of care for approximately comparable conditions appears to be much higher in an ED (some estimates are as high as 10-12 times higher) compared to care provided in an urgent clinic or physician office (UnitedHealth Group 2019; Ho et al. 2017). Estimates indicate that almost all spending growth for emergency room services reimbursed by commercial insurers in recent years has been driven by price increases, particularly for high-severity conditions, as opposed to utilization growth (Health Care Cost Institute 2018). A particular area of concern with regards to ED capacity has been reliance on the ED by many patients for mental health/SUD treatment and related challenges. Providing treatment for such patients can be complex and resource intensive and when hospitalization is required there are not always sufficient beds in hospitals for these patients.

Individuals seek care in the ED for a wide variety of reasons, including problems with access to services in other settings as well as the challenge of determining the urgency of symptoms such as chest or abdomen pain without further diagnostics. This may be part of the reason that despite a number of efforts meant to discourage use of the ED when care might be better provided elsewhere, often by a primary care provider, there is little evidence to suggest these efforts are having a sizable impact.

This report analyzes 10 years of ED utilization data from the U.S. Department of Health and Human Services' (HHS) Agency for Healthcare Research and Quality (AHRQ), from 2009-2018 at the national

¹ Joint Explanatory Statement Regarding H.R. 1865, the Further Consolidated Appropriations Act, 2020, signed into law December 20, 2019, p. 119. See <https://www.appropriations.senate.gov/imo/media/doc/HR%201865%20-%20SOM%20FY20.pdf>.

² Costs are estimated from charges by applying an average cost-to-charge ratio constructed for each hospital.

level and the state level (where possible). The current COVID-19 pandemic impacted most aspects of the health care delivery system in 2020 in different ways in different settings. Analyses of ED utilization in the early months of the pandemic have shown that ED visits declined dramatically. Estimates from the Centers for Disease Control, for instance, suggested ED visits declined by 42% between late March 2020 to late April 2020 and there were smaller though still substantial declines even for life-threatening conditions such as myocardial infarction, stroke, and hyperglycemic crisis, suggesting individuals may have been avoiding or unable to access care even in cases where the need was urgent (Lange et al. 2020; Hartnett et al. 2020). Given the need to treat relatively large populations of COVID-19 patients during peak infection periods, and some limitations placed on hospital access for elective procedures, the pandemic may have had significant impacts on utilization of emergency care services over the course of 2020.

Given the lack of consensus in the literature on whether certain types of ED visits should be considered emergency or non-emergency visits, as discussed in greater length in Section II, this report does not attempt to demarcate a clear distinction between “emergency” and “non-emergency” use of the ED. Instead, we report on overall trends for three, mutually exclusive categories of ED utilization:³

- ED visits resulting in admission to the hospital, excluding those related to mental health or substance use disorder diagnoses,
- ED visits ending in release (treat-and-release), excluding those related to mental health or substance use disorder diagnoses, and
- ED visits associated with mental health or substance use disorder (SUD) diagnoses

This report presents information on the patient, hospital, and payer characteristics for each of these three categories, as well as the most common diagnoses in each.

The report reviews some of the major issues related to potential overuse of the ED, as well as the efforts to address overuse in HHS and more broadly. These efforts to decrease unnecessary ED utilization have tended to only focus on one source of “overuse” or one particular population at a time.

- Some strategies, for instance, have focused on “superusers” (individuals with frequent, recurrent visits to the ED) or people who may have complex and ongoing health needs, such as chronic conditions or mental health/SUD conditions, to try to identify and provide the types of preventive and ongoing care they need and therefore prevent them from needing to utilize the ED. These efforts focusing on superusers also sometimes include a focus on the social determinants of health that may play a role in where people seek care, particularly for mental health/SUD treatment. Homelessness, for instance, is one example of a significant issue for this population. Previous research has suggested that frequent users of EDs for mental health conditions also are more likely to be homeless and have substance use disorders, so there seems to be important interactions between these factors that has to be considered (Moulin et al. 2018). These types of efforts focused on superusers or high-needs users are quite intensive.

³ We describe how patients receiving observation services are treated in the “Data on Utilization of Emergency Departments” section.

- Another route to decrease ED utilization is to focus on expanding access to other sources of primary and preventive care more broadly, sometimes focusing in particular on individuals who may have unmet health care needs or who do not have a regular health care provider.
- Various small-scale efforts such as in individual hospitals or health systems or individual states appear to have been effective in decreasing ED utilization, but the success of such efforts seems to depend significantly on context and patient characteristic.
- There have been a number of CMS Center for Medicare & Medicaid Innovation (the Innovation Center) models implemented in recent years that are intended to decrease ED utilization as at least one goal or component of the model, but most of these models have had a much broader overall focus such as on transforming primary care delivery. In addition, not every Innovation Center model has been designed from the beginning to clearly measure changes in ED utilization (for instance, thinking about the time, data, and comparison populations required). As discussed in greater detail below, recent preliminary results from several of these models, particularly the Accountable Health Communities model, show some initial promise for being able to reduce ED utilization, but the extent of their ultimate success and whether such initiatives will affect ED utilization at a national level has yet to be determined. Determining which strategies are effective, in what context and for which patients, will require further research and evaluations.

With regards to trends in the broader urgent care market, some evidence suggests that the proliferation of urgent care and retail clinics in recent years may substitute for EDs in certain populations under certain conditions, but thus far, these care settings do not appear to have resulted in a reduction in the national rate of ED visits over the study period of this report (Allen et al. 2019; Poon et al. 2018).

Key Data Trends: 2009-2018

- **National Results**
 - Overall rates of ED visits per 100,000 persons nationally remained relatively stable between 2009 and 2018 with rates increasing slightly between 2009 and 2016, before declining slightly in 2017 and 2018.
 - The fraction of visits associated with mental health/SUD diagnoses is relatively small compared to the other categories of utilization but grew during the earlier part of the observation period.
- **Patient Characteristics**
 - Rates of non-mental health (MH)/SUD treat-and-release ED visits were similar across age groups (those age 45-66 have a somewhat lower rate) while rates of non-MH/SUD ED visits that end in hospital admission increased with age.
 - Children (persons < age 18) had much lower rates of visits associated with a mental health/SUD diagnosis compared to other age groups.
 - Women had higher rates of all categories of ED visits but the differences were largest for rates of non-MH/SUD treat-and-release ED visits and rates of visits associated with mental health/SUD diagnoses.
 - Micropolitan and rural areas had higher rates of non-MH/SUD treat-and-release visits compared to metropolitan areas.⁴
- **Hospital and Community Characteristics**
 - While rural residents had relatively similar rates of ED non-MH/SUD visits ending in admissions and visits associated with mental health/SUD diagnoses compared to residents from other areas, rural hospitals had much lower rates of ED non-MH/SUD visits ending in admissions compared to other areas and lower rates of visits associated with mental health/SUD diagnoses. They also had relatively high rates of non-MH/SUD treat-and-release visits.
 - This may indicate that when rural patients need care that may result in a hospital admission, they are more likely to obtain that care at a distant hospital, perhaps due to real or perceived capacity constraints or perceptions of quality of care at their local rural hospital.
 - Hospitals located in micropolitan areas had the highest rates of treat-and-release visits.
 - For all three categories of ED visits, rates were higher for persons living in areas with lower median income levels and higher community social vulnerability; however, the proportion of ED visits accounted for by each category of visit did not vary substantially by these measures.
- **Payer Trends**
 - The proportion of ED visits within each type analyzed that were covered by various payers over time generally reflected changes in rates of health insurance coverage and aging of the population that occurred during the observation period.

⁴ Micropolitan statistical areas are based on urban clusters of at least 10,000 population but less than 50,000. More information can be found here <https://www.govinfo.gov/content/pkg/FR-2010-06-28/pdf/2010-15605.pdf>.

- The proportion of total ED visits nationally with either no expected payer/self-pay and the proportion with private insurance as the expected payer declined overall between 2009 and 2018, while the proportion with Medicare as the expected payer and the proportion with Medicaid as the expected payer both increased.
 - **Medicare:** The proportion of non-MH/SUD ED visits ending in an admission and the proportion of non-MH/SUD that were treat-and-release and reimbursed by Medicare increased somewhat over time.
 - **Medicaid:** The proportion of ED visits that were non-MH/SUD treat-and-release and the proportion of visits associated with mental health/SUD diagnoses and reimbursed by Medicaid increased over time. Within Medicaid, the proportion of visits accounted for by those non-MH/SUD visits ending in admission and non-MH/SUD treat-and-release visits decreased slightly over time while visits associated with mental health/SUD diagnoses increased.
 - **Private Insurance:** The proportion of non-MH/SUD ED visits that ended in admission and the proportion that were non-MH/SUD treat-and-release and reimbursed by private insurance decreased over time, while the proportion for visits associated with mental health/SUD diagnoses remained relatively steady.
 - **Self-Pay, No Charge:** The proportion of ED visits that were non-MH/SUD treat-and-release and the proportion associated with mental health/SUD diagnoses and were self-pay or no charge decreased between 2013 and 2015, coinciding with the large reduction in the uninsured rate nationally under the Affordable Care Act, then remained relatively stable through 2018. The proportion of non-MH/SUD ED visits ending in admission that were self-pay or no charge also decreased slightly over the observation period.
 - For both non-MH/SUD admissions and non-MH/SUD treat-and-release visits, states included in our data that expanded their Medicaid programs in 2014 had larger increases over time in the percent of visits where the expected payer was Medicaid compared to states that did not expand their Medicaid programs between 2014 and 2018. These expansion states also had somewhat larger decreases in the percent of non-MH/SUD visits ending in admission and the percent of non-MH/SUD treat-and-release visits where the expected payer was self-pay/no charge relative to states that did not expand their Medicaid programs. However, non-expansion states also experienced a decline over time in the percent of visits that were self-pay/no charge.
- **Geographic Trends**
 - Variation in rates of ED visits exist between states, and the geographic variation is different for each type of ED visit.
 - This suggests state-level characteristics may be important to consider when analyzing variation in ED visits
- **Top Diagnoses**
 - For non-MH/SUD treat-and-release ED visits, the most common diagnoses include abdomen/digestive issues, upper respiratory infections, injuries, sprains/strains, and

chest pain, many of which are conditions that may be difficult for the patient to determine severity until more diagnostic procedures are done.

- Many of the most common diagnoses for non-MH/SUD ED visits ending in hospital admission require tertiary care, such as septicemia, cerebral infarction, and acute myocardial infarction. Other common diagnoses were ones that can require admission when they progress past a certain point, such as pneumonia and skin and subcutaneous tissue infections.
- For ED visits with mental health/SUD as a primary diagnosis, almost a quarter are alcohol-related, followed by anxiety/fear-related disorders, depressive disorders, suicidal ideation, and schizophrenia. For ED visits with mental health/SUD as a secondary diagnosis, the most common primary diagnoses are a mix of common diagnoses from other categories, such as nonspecific chest pain, septicemia, abdominal/digestive issues, urinary tract infections, and skin and subcutaneous tissue infections.



ASPE
ASSISTANT SECRETARY FOR
PLANNING AND EVALUATION

OFFICE OF
HEALTH POLICY

Section 2: Categorizing Utilization of Emergency Departments

Categorizing Utilization of Emergency Departments

Questions about the appropriate use and role of EDs in the healthcare system, and related issues of potential overuse, have been debated and discussed for many years. While the ED may be thought of as a place for the treatment of emergencies and urgent conditions, in fact there are a very wide range of reasons individuals seek care in the ED, including as a place to receive less urgent and primary care. In fact, prior work, as well as the analyses in this report (described below), show that visits to the ED that do not end in admission to that hospital are the majority of ED visits in the United States (Moore et al. 2017).

There are a number of reasons an individual might seek care at an ED, even in cases that may not appear to be emergencies. One is insurance coverage, or lack of coverage. In the United States, EDs are required to stabilize all patients under the Emergency Medical Treatment & Labor Act (EMTALA), regardless of their ability to pay, though they are able to be billed for those services afterwards.⁵ Another reason may be accessibility issues or convenience. If there is not adequate or accessible primary care or preventive care, for instance, patients may need to rely on the ED. Even when an individual has a regular source of care, if they are not open at night or on weekends or have long waits for an appointment, they may not be accessible when they are needed, and a number of previous analyses have indicated that access and convenience play an important role in the choice to seek care in an ED (Usher-Pines et al. 2013; Coster et al. 2017). Individuals may also not have a regular primary care provider, particularly if they are uninsured or newly insured (Garfield and Young 2015). Other studies have shown that a significant number of patients seeking care in the ED are referred there by their primary care physician, in some cases because the regular provider does not have available appointments (Usher-Pines et al. 2013).

To the extent that care provided in the ED could have otherwise been handled in an accessible ambulatory care setting, there are a number of potential reasons for concern regarding overuse of EDs. A primary one is the potential for care provided in the ED to be significantly higher cost compared to other sources of care (Weinick et al. 2010; Bentley et al. 2008). Another is the potential for crowding, which can have a number of adverse consequences, including longer wait times, and worse health outcomes including higher mortality for patients (Sun et al. 2013; Morley et al. 2018). One issue to consider, however, is that crowding and wait times are not just a function of volume of patients, but also of how quickly they are assessed and moved through. Behavioral health patients, for instance, can be slower and more difficult to process because of a shortage of behavioral health beds (Morley et al. 2018). Another point of concern is that when patients regularly use EDs for ongoing health needs, they do not receive the same continuity of care or preventive care that they would from a primary care provider, which could affect the overall quality of care they receive.

One of the challenges in addressing potentially inappropriate utilization of EDs is that it is quite challenging to define what is inappropriate or an emergency, either for patients or for researchers

⁵ This requirement was established in the Emergency Medical Treatment & Labor Act in 1986. More information can be found here <https://www.cms.gov/Regulations-and-Guidance/Legislation/EMTALA>.

looking at claims or survey data after the fact. Even leaving aside issues of access or availability of other sources of care, it can be difficult for a patient to have the knowledge necessary to determine the urgency of their situation and there can be varying levels of information or beliefs about the appropriate use of EDs in general. In addition, in situations where accessibility is a serious challenge, some might argue that it can be appropriate to utilize the ED for something that is not an emergency. One frequent example is abdominal pain, which is a symptom associated with wide range of conditions, some of which could be easily treated at home and others which may require urgent surgery. Particularly for patients with severe abdominal pain and other concerning symptoms occurring over the weekend, such patients may feel safer visiting an ED with advanced diagnostics than waiting to see their primary care provider on Monday, and may even be told to do so by their primary care provider or another on-call provider. There are many other conditions where the need for hospital care is unclear without further diagnostics available in a hospital or where the availability of other local providers may be limited (e.g., there are substantial shortages of behavioral health providers in many areas of the country).

The lack of a consensus in the literature on “appropriate use” or what is an “emergency” makes researching this topic challenging. For instance, some researchers use a “triage score,” a 5-level triage acuity score based on the triage nurse’s judgement about the urgency of the patient’s needs, as a way to divide visits into emergencies or non-emergencies. However, although there is a correlation between this score and severity of patient condition, several previous analyses have shown that it is not always a strong predictor of outcomes or urgency of patient need (Hsia and Niedzwiecki 2017; Honigman et al 2013) An additional method of classification that is used in many previous analyses is the New York University Emergency Department visit severity algorithm developed by Billings et al (2000). This algorithm separates visits into non-emergent, emergency but primary care treatable, emergent ED care needed but preventable/avoidable, and emergency ED care needed and not preventable/avoidable. A caveat with this algorithm is that injuries and mental health/SUD cases are their own category and not assessed as to their level of urgency or ability to be avoided (Billings et al. 2000). Another related aspect of this challenge with definitions is that because there is little consistency across the literature in how researchers define what is appropriate or urgent ED use, it is difficult to even estimate the percent of ED visits that are “inappropriate,” much less compare results or reach conclusions about strategies for decreasing inappropriate utilization (Uscher-Pines et al. 2013; Hsia and Niedzwiecki 2017).

Given the lack of consensus in the literature, we report on overall trends for three mutually exclusive categories of ED utilization:

- ED visits resulting in admission to the hospital, excluding those related to mental health or substance use diagnoses,
- ED visits ending in release (treat-and-release), excluding those related to mental health or substance use diagnoses, and
- ED visits associated with mental health or substance use disorder (SUD) diagnoses.



ASPE
ASSISTANT SECRETARY FOR
PLANNING AND EVALUATION

OFFICE OF
HEALTH POLICY

Section 3: Data on Utilization of Emergency Departments

Data on Utilization of Emergency Departments

Data for this report were provided by the AHRQ from the Healthcare Cost and Utilization Project (HCUP). HCUP includes the largest collection of longitudinal hospital care data in the United States, including information on ED utilization. Encounter records in the HCUP data include ICD-coded diagnoses and procedures, as well as hospitalization characteristics including patient demographics, admission source, discharge disposition, length of stay, and hospital charges.

The estimates in this report are primarily based on data from three of AHRQ's HCUP databases:

- the Nationwide Emergency Department Sample (NEDS),
- the State Inpatient Databases (SID), and
- the State Emergency Department Databases (SEDD).

For any given year, the NEDS includes all encounter records from a sample of EDs, with data drawn from all available SID and SEDD. Population data are obtained from Claritas, a vendor that produces population estimates and projections based on data from the U.S. Census Bureau. Additionally, the HCUP data were linked by patient county of residence to the Centers for Disease Control and Prevention's (CDC) Social Vulnerability Index (SVI), which uses census variables to identify communities that may be more vulnerable to stresses on health. The unit of analysis for these HCUP data is the encounter (a visit to an ED), rather than a patient.

The NEDS, SID, and SEDD have a number of strengths for this project:

- they can be linked together and used for national estimates as well as for state estimates for participating states (something that is not possible for most data sources on ED visits),
- they have data available over a number of years.

This analysis focuses on the most recent 10 years of data available (2009-2018). Details on the HCUP databases used in developing this report are found in the Appendix as is a reading list of publications on ED utilization produced by HHS.

ED visits are divided into three mutually exclusive categories: 1) ED visits that resulted in a hospital admission to the same hospital as the ED (excluding those involving a primary or secondary diagnosis of mental health/SUD), 2) ED visits that did not result in admission to the same hospital (referred to as a treat-and-release, excluding those involving a primary or secondary diagnosis of mental health/SUD), and 3) ED visits with a primary or secondary diagnosis of a mental health/SUD regardless of hospital admission. Patients who receive "observation services," meaning they are put under observation for usually less than 24 hours while it is determined whether they need to be admitted, can be included in any of these three categories, depending on how their visit resolves. For instance, if they are eventually admitted to the hospital they would be included in the admissions category. Patients who are treated and released from observation units are included in the treat-and-release category. For the purposes of this report we do not break apart each category to see which patients had observation services prior to

being admitted or released.⁶ More details on how these categories were constructed is available in the Appendix. We also provide data on the most common diagnoses for each type of ED visit.

⁶ The role of observation services in ED utilization, and the challenges of identifying those services in the data, are fairly complex. A description of the issues and how they are addressed in HCUP data is available here: <https://hcup-us.ahrq.gov/reports/methods/2016-05.pdf>



ASPE
ASSISTANT SECRETARY FOR
PLANNING AND EVALUATION

OFFICE OF
HEALTH POLICY

Section 4: Results of Analysis on Emergency Department Utilization

Results of Analysis on Emergency Department Utilization

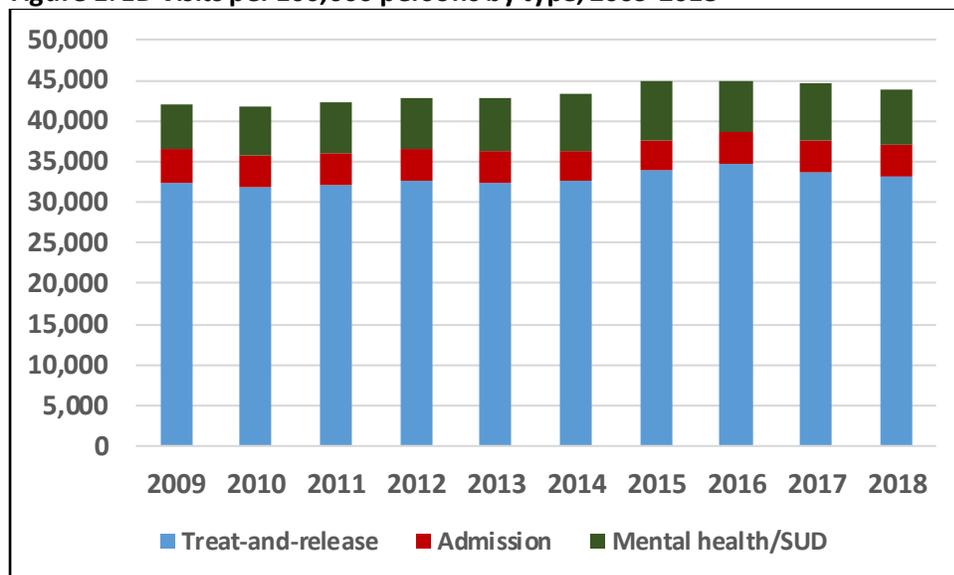
National Trends

Despite efforts to decrease the number of patients that visit the ED each year, overall trends suggest these efforts have not had a large impact on total numbers. The CDC reports that the volume of ED visits in the National Health Care Survey (NHCS) began to gradually increase in the 1990s (Bernstein et al. 2003). HCUP data shows that for the period from 2006 to 2015, the rate of ED visits per capita nationally reached its high in 2015, although the proportion of ED visits that ended in a hospital admission declined for all age groups over that period, particularly for adults 65 and older (Sun et al. 2018). Figure 1 below shows that the total number of ED visits in the United States per 100,000 persons has remained relatively stable with minor fluctuations between 2009 and 2018. Figure 1 also shows how the total rates break down into the three categories analyzed (non-MH/SUD admissions, non-MH/SUD treat-and-release, and mental health/SUD), and that the rate of non-MH/SUD treat-and-release ED visits generally trended upward between 2009 and 2016 and then declined slightly.⁷ AHRQ reports that between 2006 and 2014 the rate of mental health/SUD ED visits increased by over 44%, although starting from a much lower level compared to treat-and-release, and Figure 1 shows that the rate began to decline a little after 2016 (Moore et al. 2017).

Overall, the data presented in Figure 1 indicate that between 2009 and 2018, the proportion of ED visits accounted for by each category remained relatively stable. However, the mental health/SUD categorization relies on ICD-9-CM codes from 2009 until the third quarter of 2015 and ICD-10-CM codes from 2016 to 2018. There are known discontinuities between these two coding systems that include a transition period as the new codes were adopted. For this reason, care should be taken in interpreting changes in rates around the time of the ICD transition.

⁷ Table 2A in the Appendix shows the rates shown in Figure 1 as well as the percent of total ED visits by category for each year from 2009 to 2018.

Figure 1: ED visits per 100,000 persons by type, 2009-2018



Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), Nationwide Emergency Department Sample (NEDS), 2019-2018. Treat-and-release and admissions exclude those visits related to mental health/SUD; the three categories are mutually exclusive.

Patient Characteristics

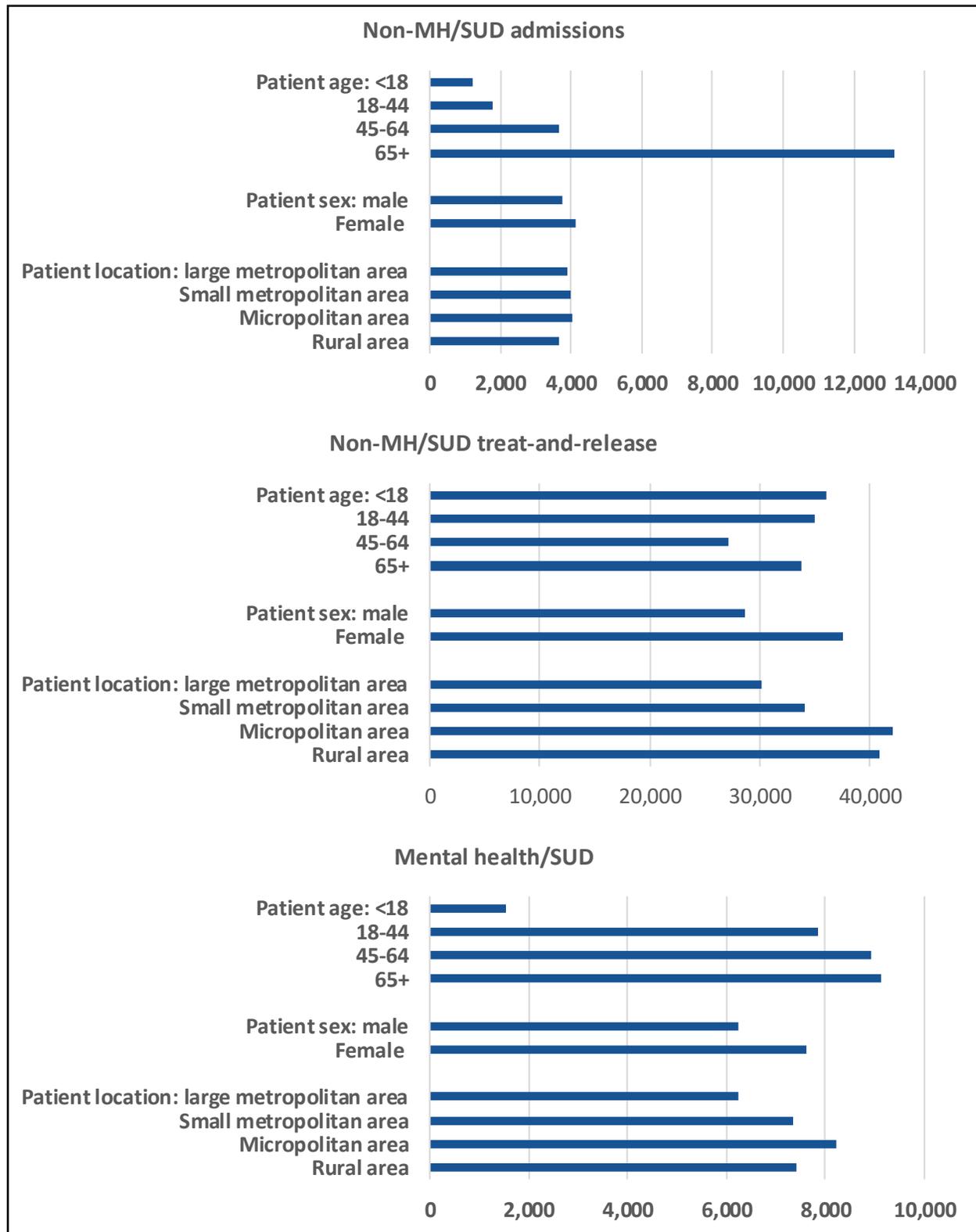
The numbers and rates of ED visits vary by patient and community characteristics, and these differences in utilization may speak to the reasons that patients seek care in the ED rather than from another source. For instance, among adults, those between 18 and 24 and those over 65 (particularly those over 75) are generally the most likely to have reported visiting an ED in the past year (National Center for Health Statistics 2019) and to have the highest rate of ED visits (Sun et al. 2018; Ashman et al. 2020).

Figure 2 shows the rate of each of the three types of ED visits analyzed in this report, in 2018, by select patient characteristics.

- It shows that the rate of non-MH/SUD ED visits ending in admission rises with age, consistent with previous AHRQ work showing that the proportion of ED visits that ended in admission is consistently lowest for children and increases with age (Sun et al. 2018).
- The rate of non-MH/SUD ED visits that are treat-and-release is more even across age groups.
- ED visits for mental health/SUD diagnoses are much lower for children and then increase somewhat with age for adults.
- Women have a higher rate of all three types of ED visits, but this difference is particularly large for non-MH/SUD treat-and-release visits and mental health/SUD visits.
- There are lower rates of non-MH/SUD treat-and-release visits and mental health/SUD visits among patients in the most metropolitan of locations, although for non-MH/SUD admissions the rates are more consistent across patient geography. This is consistent with previous analyses showing rural areas have higher rates of treat-and-release ED visits than urban areas, and that adults who live in a metropolitan statistical area were less likely to report having been to an ED

overall compared to those living outside a metropolitan statistical area (Weiss et al. 2011; National Center for Health Statistics 2019).

Figure 2: ED visits per 100,000 persons by type and patient characteristics, United States, 2018



Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), Nationwide Emergency Department Sample (NEDS), 2019-2018.

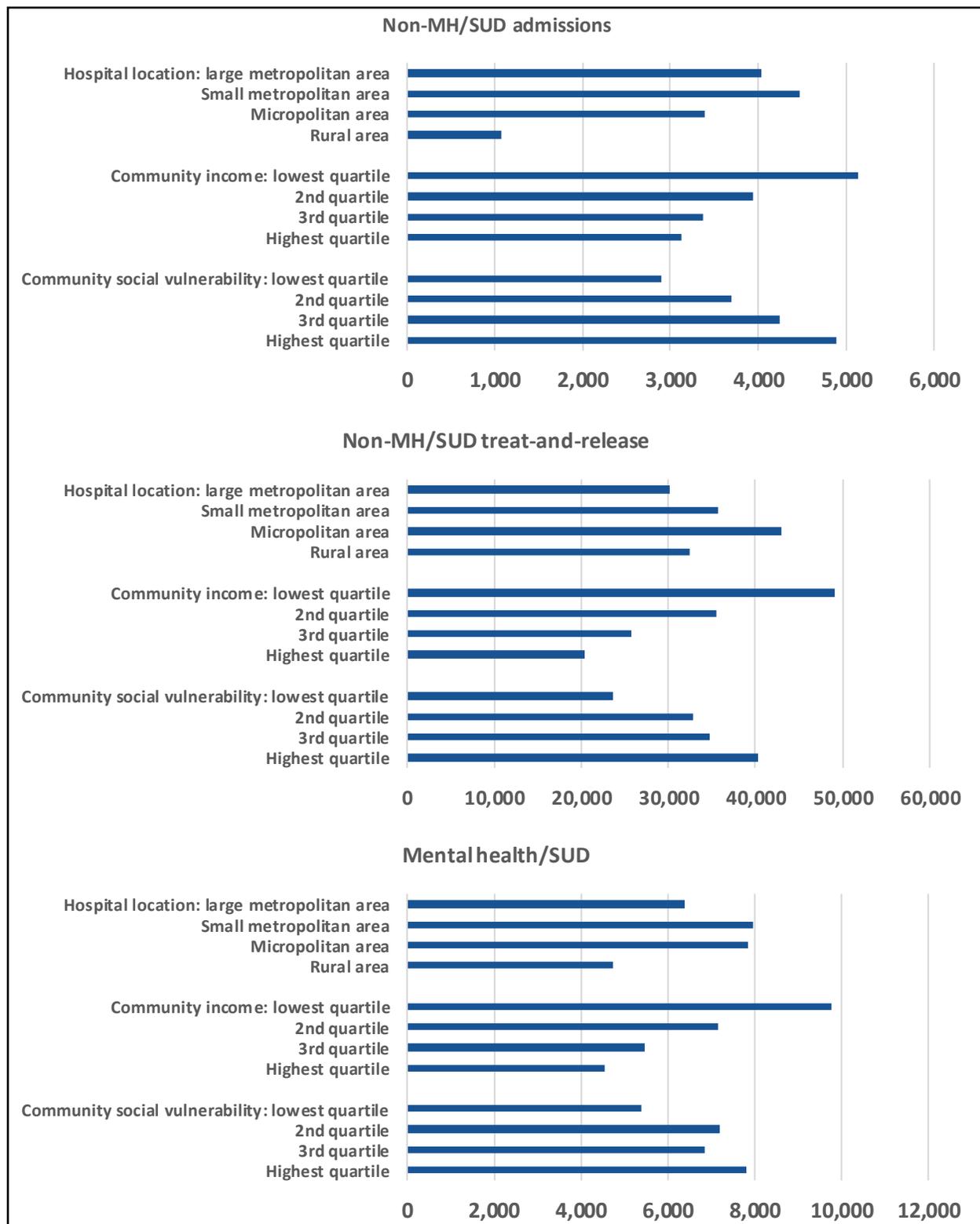
Hospital and Community Characteristics

One of the challenges with HCUP NEDS data, due to the source used to populate the data, is that generally there is not much patient information beyond age and sex. For instance, it does not include information on patient race, ethnicity, or socioeconomic status, although some of the individual state databases include some of this information, as well as patient county of residence. However, analyses from other sources have shown that a higher proportion of adults who report being Black, American Indian/Alaska Native, or two or more races report having visited an ED in the past year, compared to White or Asian respondents (National Center for Health Statistics 2019).

Figure 3 shows the rate of ED visit per 100,000 persons for each of the three types of visits by hospital location, community median income, and community social vulnerability (for more information on community social vulnerability, see the data description above or the Appendix).

- Hospitals located in rural areas have much lower rates of non-MH/SUD admissions than hospitals in less rural areas. Given that patients with rural residential addresses had similar rates of non-MH/SUD ED visits ending in a hospital admission compared to patients from other geographies, and rural hospitals have higher rates of non-MH/SUD treat-and-release visits relative to non-MH/SUD hospital admission visits, this likely indicates that when rural patients may need more advanced care that may result in a hospital admission, they are more likely to obtain such care from more distant hospitals.
- Hospitals in small metropolitan areas or micropolitan areas have the highest rates of non-MH/SUD treat-and-release visits or mental health/SUD visits.
- For all three types of visits, patients located in communities with the lowest median income have the highest rates of visits, and the rate falls as incomes go up.
- A similar pattern is seen with community social vulnerability, with the highest rates of ED visits among patients in communities that are the most vulnerable and decreasing rates for less vulnerable communities. The data also indicate that although the rate of visits per 100,000 persons varies by community income and vulnerability, the proportion of ED visits accounted for by each category of ED visit does not vary substantially by median income level or level of community social vulnerability (shown in Appendix Table A3). This same analysis for the component pieces of the vulnerability index can be found in Figure A3 in the Appendix.

Figure 3: ED visits per 100,000 persons by type and community characteristics, United States, 2018



Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), Nationwide Emergency Department Sample (NEDS), 2019-2018 and CDC Social Vulnerability Index (SVI). Community median income is by patient zip code and the SVI is by the patient's census tract.

Payer Trends

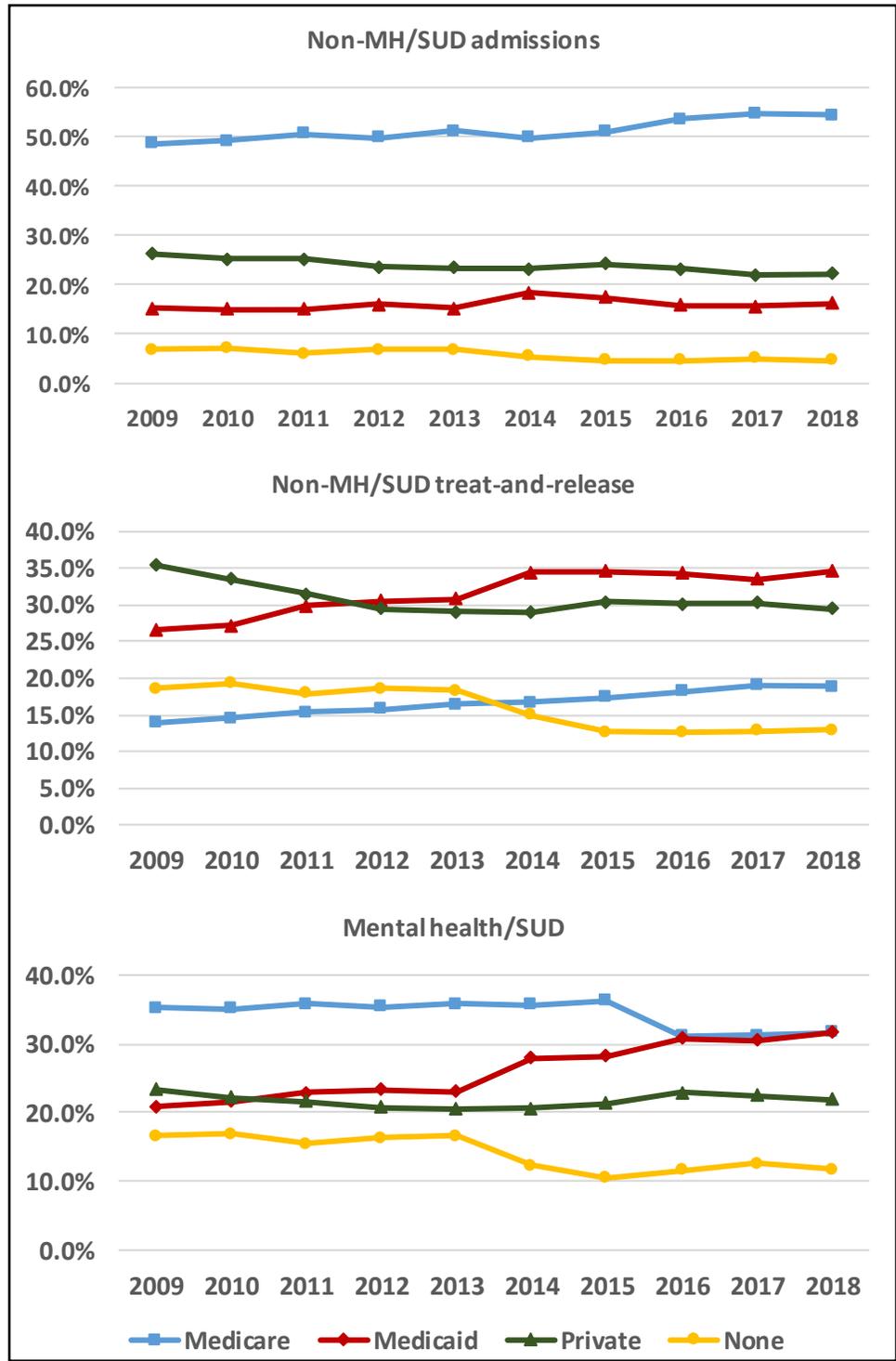
Previous analyses have shown that utilization of the ED is also related to insurance coverage (for instance, Sun et al. 2018 and National Center for Health Statistics 2019 are two examples). Adults under the age of 65 with Medicaid were approximately twice as likely to report having gone to the ED in the past year compared to those who are privately insured (National Center for Health Statistics 2019). There are a number of potential factors contributing to this difference in ED utilization, including the higher disease burden in Medicaid, barriers to accessing other sources of care such as outpatient providers for low-income populations, and the fact that there is generally significantly higher cost-sharing for ED use in private insurance (Allen et al. 2021). While there is a common perception that uninsured individuals may have substantially higher utilization of EDs, they have been found to have only slightly higher ED utilization rates than those who are privately insured and have lower utilization rates than insured adults overall (National Center for Health Statistics 2019).

Previous work has shown that between 2006 and 2015, the share of ED visits for children was highest among those with Medicaid and increased substantially, while the share covered by private insurance declined. Similarly, among adults 18-64, the share of ED visits covered by private insurance decreased and the share covered by Medicaid increased for most years between 2006 and 2015 (Sun et al. 2018; Moore et al. 2017). Increases in the share of ED visits with Medicaid as an expected payer over this time period is unsurprising given that Medicaid expansion took place in many states during this period.⁸ The Medicaid and CHIP Payment and Access Commission (MACPAC) reports that between 2013 and January 2020, enrollment in Medicaid in expansion states increased by 12.4 million (32.6 percent) in the new adult group (2020). Figure 4 below shows, for the three types of ED visits analyzed, the percent for each primary expected payer from 2009 to 2018 (percent of total ED visits combined into one category by expected payer are shown in Figure A1 in the Appendix).

- The top panel shows that approximately 50 percent of non-MH/SUD admissions had Medicare as the expected payer, followed by private insurance, Medicaid, and no insurance.
- For both non-MH/SUD treat-and-release and mental health/SUD visits, there is a general upward trend in the percent with Medicaid as the expected payer during this time, explainable in part by Medicaid expansion and the Affordable Care Act which resulted in a large decline in the percent uninsured.

⁸ State-by-state trends in ED visits by expected primary payer over time, with information on whether that state is a Medicaid expansion state, is available from AHRQ here: <https://hcup-us.ahrq.gov/faststats/statepayer/statesED.jsp>

Figure 4: Percent of ED visits by type and expected payer, United States, 2009-2018



Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), Nationwide Emergency Department Sample (NEDS), 2019-2018. Primary payer is shown here categorized as Medicare, Medicaid, private insurance, and none (self-pay or no charge). Very small numbers of other are not shown. The mental health/SUD categorization relies on ICD-9-CM codes from 2008 until the third quarter of 2015 and ICD-10-CM codes from 2016 to 2018. There are known discontinuities between these two coding systems that include a transition period as the new codes were adopted. For this reason, care should be taken in interpreting changes before and after the ICD transition.

To get at this issue further, the percent of ED visits with Medicaid as the primary expected payer by type of visit for the years 2009 to 2018 is shown in Table 1.

- The data show that the percent of ED visits with Medicaid as the expected payer that were non-MH/SUD and resulted in hospital admission or were treat-and-release declined slightly during this time, while the percent that were mental health/SUD related increased.
- There is also a small decline in the percent of non-MH/SUD treat-and-release visits with private insurance as the expected payer during these years but an increase in the percent with Medicare as the expected payer.

Table 1: Percent of ED visits with Medicaid as the primary expected payer, United States, 2009-2018

	Admissions (Non-MH/SUD)	Treat-and-release (Non-MH/SUD)	Mental health/SUD ^a
2009	6.1%	82.8%	11.1%
2010	5.9%	82.0%	12.0%
2011	5.2%	82.6%	12.1%
2012	5.1%	82.7%	12.2%
2013	4.8%	82.5%	12.7%
2014	4.8%	80.9%	14.4%
2015	4.4%	81.0%	14.6%
2016	4.2%	82.4%	13.3%
2017	4.5%	80.7%	14.9%
2018	4.5%	80.2%	15.3%

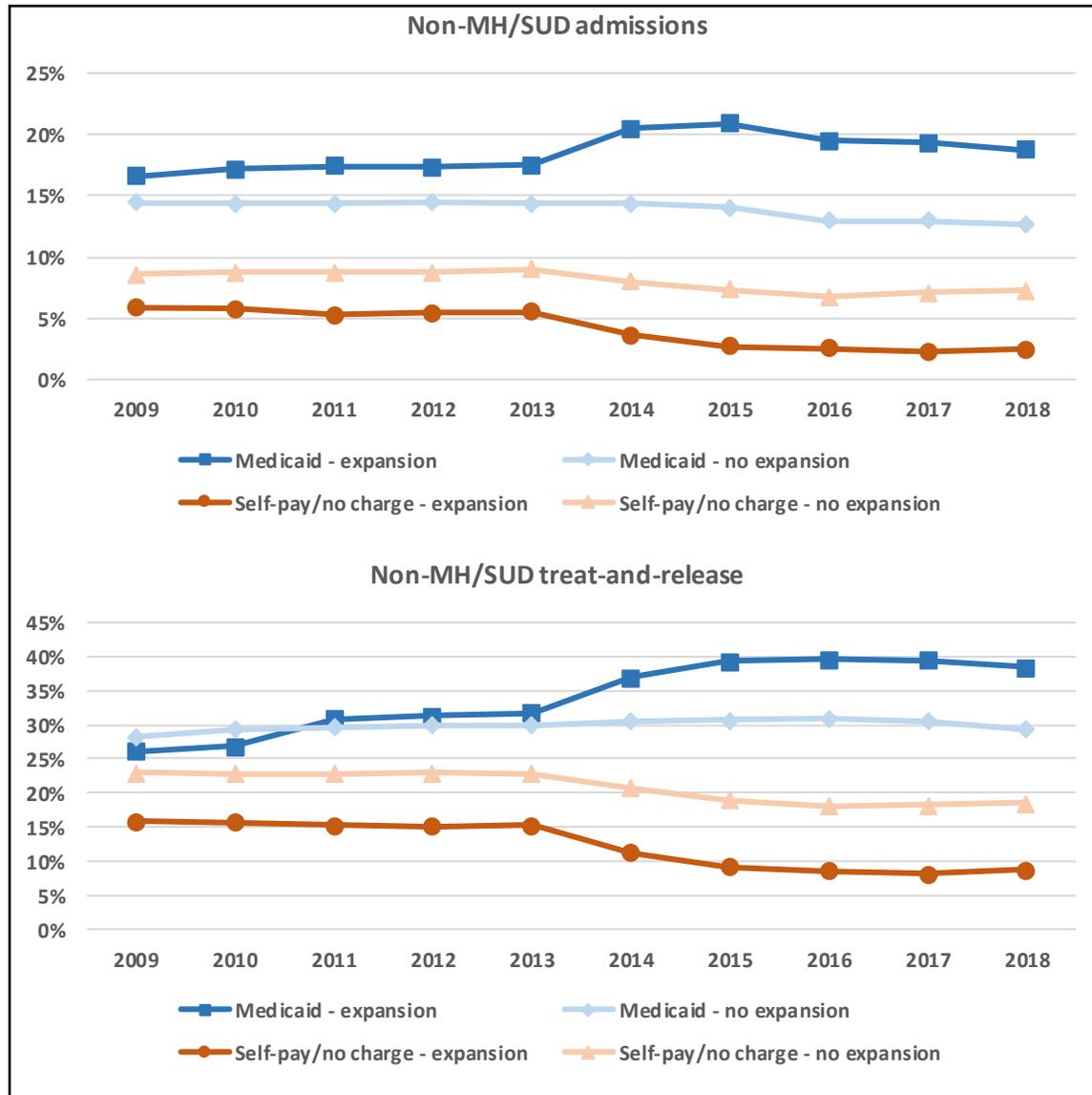
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), Nationwide Emergency Department Sample (NEDS), 2019-2018.

^a The mental health/SUD categorization relies on ICD-9-CM codes from 2008 until the third quarter of 2015 and ICD-10-CM codes from 2016 to 2018. There are known discontinuities between these two coding systems that include a transition period as the new codes were adopted. For this reason, care should be taken in interpreting changes before and after the ICD transition.

For non-MH/SUD admissions and treat-and-release ED visits, Figure 5 compares the percent of visits with expected payer of Medicaid or of self-pay/no charge by Medicaid expansion. For this figure only, we restrict to states that contributed to HCUP for all 10 years and categorize them as expansion or non-expansion based on whether they expanded in 2014. One state that expanded its Medicaid program in 2015 was dropped from the analysis although including it does not change the results appreciably. Although these estimates are not, therefore, nationally representative, they can give some sense of how expected payer was changing over time in expansion versus non-expansion states. In addition, because Medicaid expansion happened at approximately the same time as the ICD transition, discussed previously, we do not show changes over time for visits associated with mental health/SUD services in this figure. It is challenging to disentangle the contribution to trends due to ICD coding vs. Medicaid expansion. This figure suggests:

- States that expanded Medicaid and those that did not were different even before expansion in terms of the percent of ED visits had Medicaid versus self-pay/no charge as the expected payer.
- For both non-MH/SUD admissions and treat-and-release, there was a larger increase in the percent of visits with Medicaid as the expected payer and a larger decrease in the percent of visits that were self-pay/no charge for states that expanded Medicaid.
- Even among states that did not expand Medicaid, there was some decline over time in the percent of visits that were self-pay/no charge.

Figure 5: Percent of ED visits by type and expected payer for states that did or did not expand Medicaid, 2009-2018

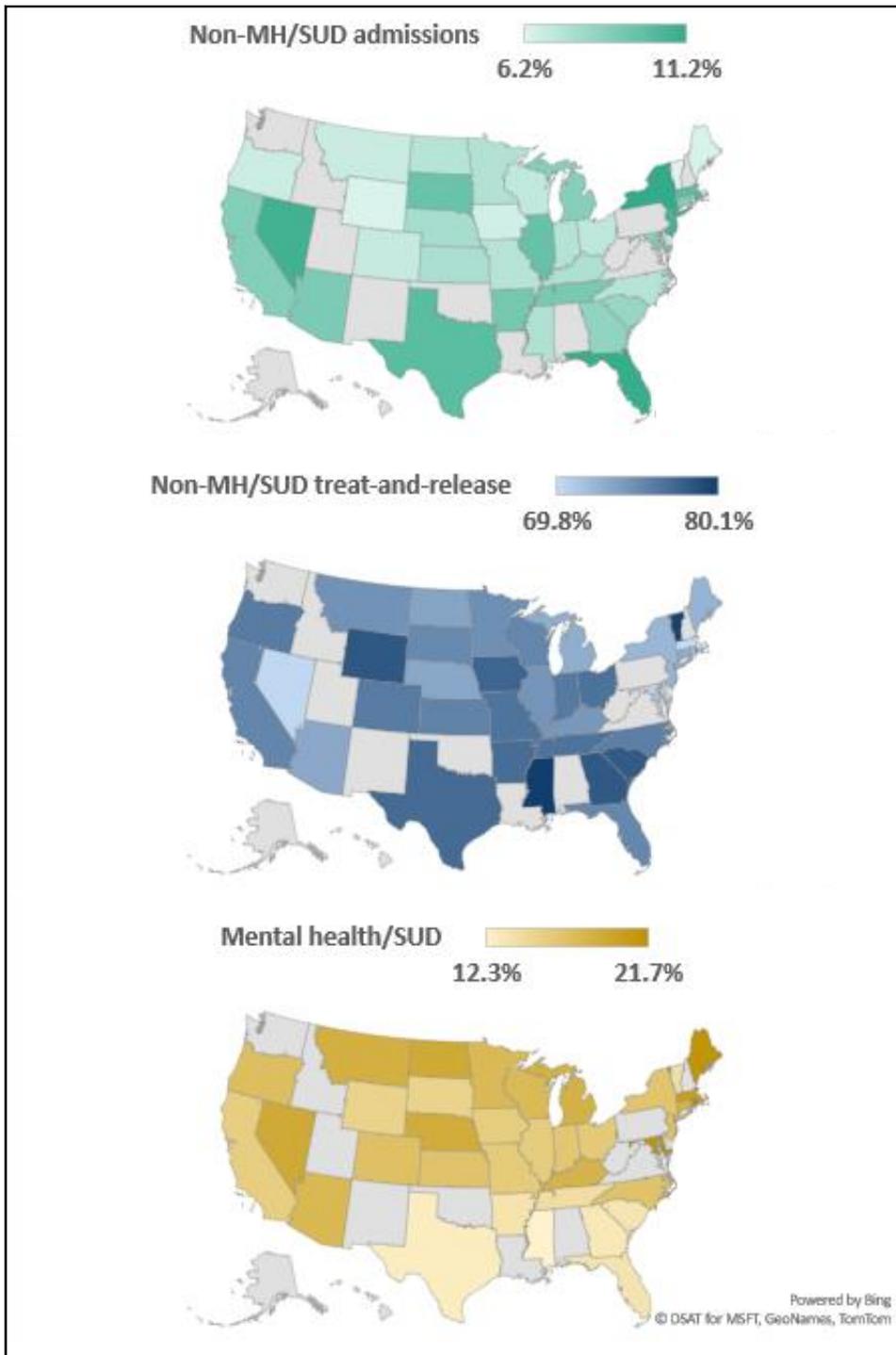


Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Emergency Department Databases (SEDD), and State Inpatient Databases (SID), 2009-2018. States included were those that contributed to HCUP every year from 2009-2018 and included: Arizona, California, Connecticut, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Maryland, Massachusetts, Minnesota, Missouri, Nebraska, New Jersey, New York, North Carolina, Ohio, Rhode Island, South Carolina, South Dakota, Tennessee, Vermont, Wisconsin

Geographic Trends

A challenge when comparing ED utilization at the state level is the fact that people can and often do cross state borders to seek health care services, which in this case is particularly problematic when not all states contribute data to HCUP. For these reasons, state-level rates per 100,000 persons cannot easily be calculated in an unbiased way because the denominator would not include the same population that is included in the numerator. However, to provide some state-by-state comparison, maps of the percent of ED visits that fall into each category by state (rather than rates per 100,000 persons) in 2018 are shown below. Figure 6 below shows the percent of ED visits by type at the state level, suggesting there is geographic variation in ED visits by type (states that are a gray color did not contribute to HCUP in 2018). Rates per 100,000 at the regional level are shown in Figure A2 in the Appendix, but as Figure 6 indicates, state-level characteristics may be important to consider when analyzing variation in ED visits. In addition, Table A4, Table A5, and Table A6 in the Appendix show the counts of each category of ED visit by state for 2009 to 2018.

Figure 6: Percent of ED visits by type and state, 2018



Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Emergency Department Databases (SEDD), and State Inpatient Databases (SID), 2019-2018.

Note: States shaded in gray did not contribute to HCUP in 2018.

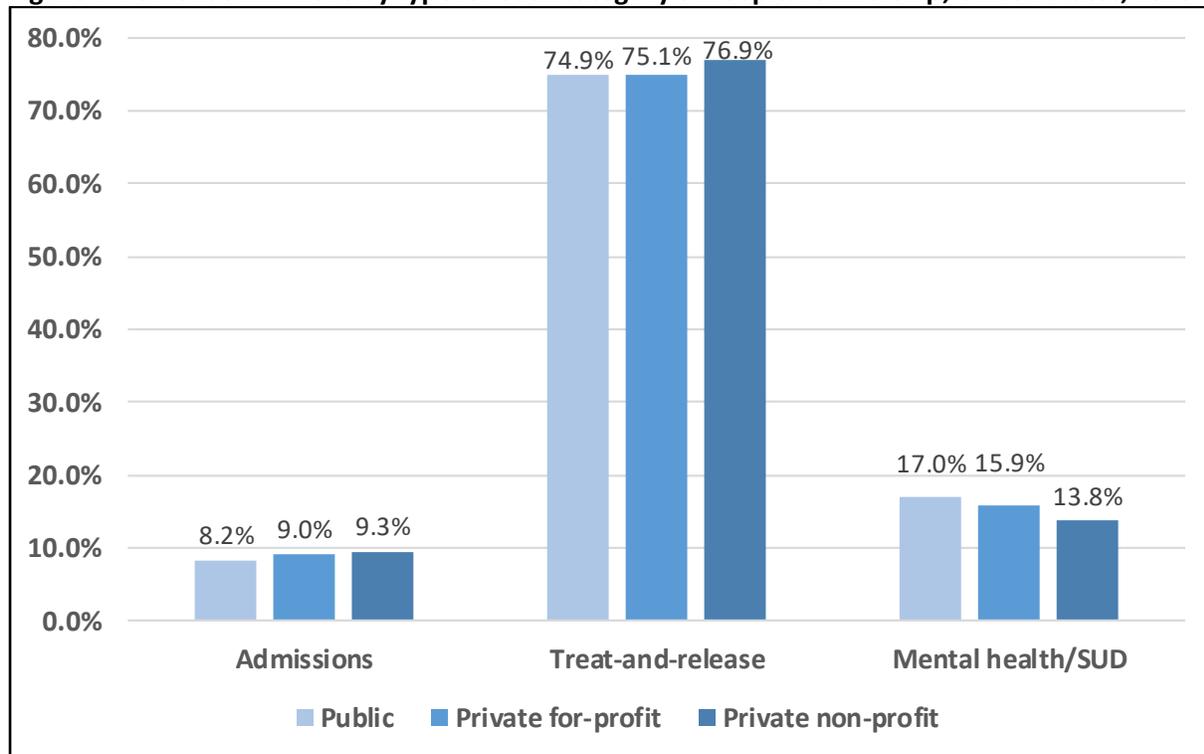
Hospital Type

Hospitals may also have different patterns of ED utilization depending on their ownership type. In the United States, approximately 19 percent of community hospitals (the type of hospital included in the HCUP databases) are public, nearly 57 percent are private non-profit, and 25 percent are private for-profit (American Hospital Association 2019).

Figure 7 below shows, for each category of hospital ownership, what percent of ED visits fall into each of the three categories analyzed.

- The portion of ED visits at public hospitals that are non-MH/SUD admissions or treat-and-release are slightly lower than for the other hospital ownership types.
- A higher portion of visits at public hospitals are related to mental health/SUD compared to the other hospital ownership types.
- The opposite is true for private non-profit, with private for-profit in between.
- Variation across hospital types is relatively small, with the largest difference being the larger proportion of mental health/SUD at public hospitals relative to other hospital ownership types.

Figure 7: Percent of ED visits by type for each category of hospital ownership, United States, 2018



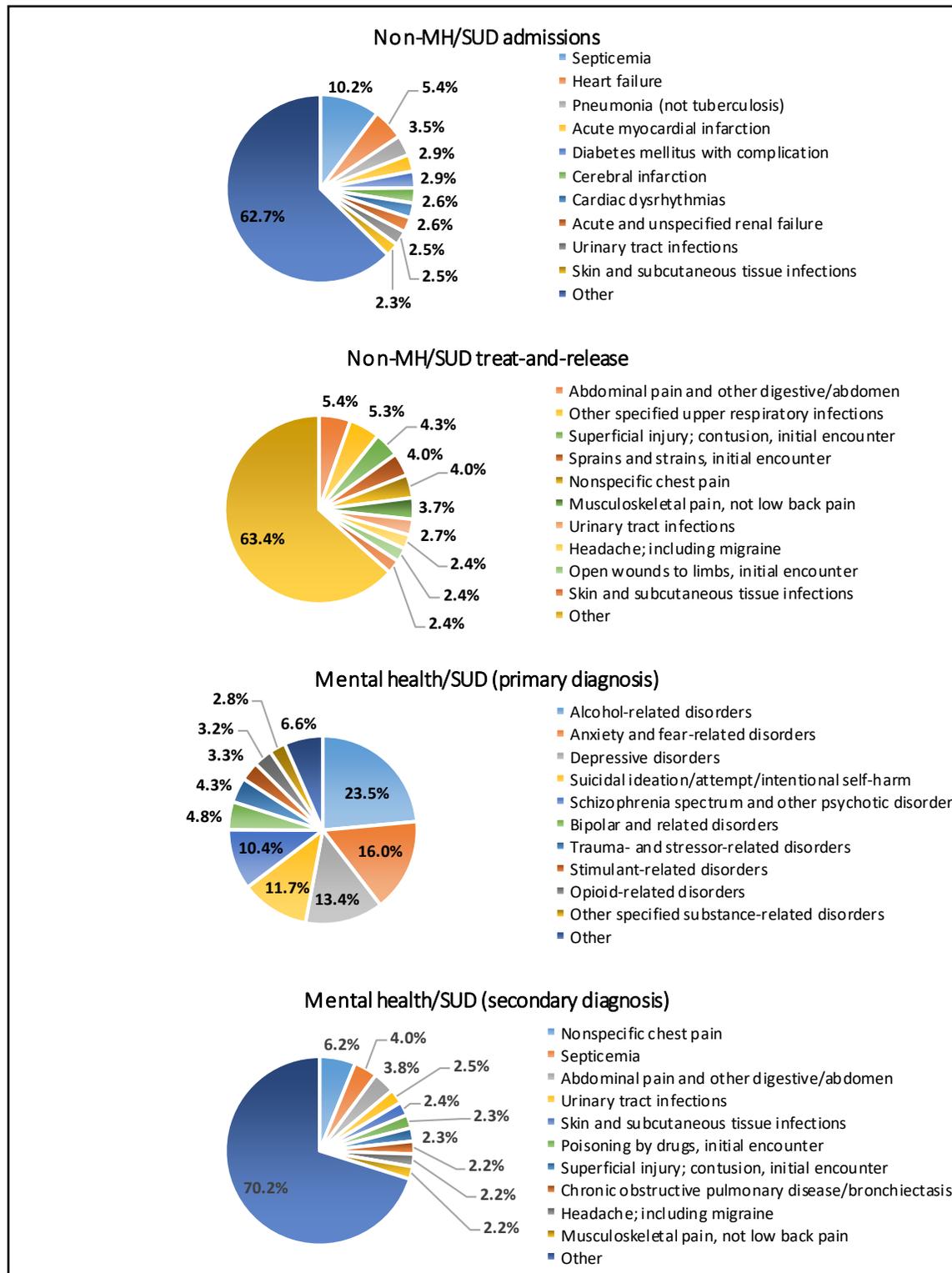
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), Nationwide Emergency Department Sample (NEDS), 2019-2018 and the American Hospital Association Annual Survey. The three categories of ED visits are mutually exclusive; the categories of “admissions” and “treat-and-release” exclude those related to mental health/SUD diagnoses.

Diagnoses

Figure 8 below shows the top 10 diagnoses by ED visit category and the percent of all visits in that category accounted for by each type of diagnosis. For this figure only, mental health/SUD visits are split into those where mental health/SUD is the primary diagnosis versus those in which it is a secondary diagnosis, to give a better sense of what is included in that set of visits.

- As expected, many of the most common diagnoses for non-MH/SUD ED visits that result in a hospital admission are for conditions that require tertiary care (e.g., septicemia and acute myocardial infarction). For other conditions (e.g., pneumonia and skin and subcutaneous tissue infections), it may be appropriate to initially treat them in an ambulatory setting, but once these conditions advance beyond a certain point, a hospital admission may become necessary.
- For non-MH/SUD treat-and-release, the largest category accounting for approximately 5 percent of such visits is abdomen/digestive issues, followed by upper respiratory infections, injuries, sprains/strains, and chest pains. The severity of a patient's underlying condition when they exhibit symptoms such as abdominal and chest pain is often difficult to ascertain until certain diagnostic procedures, generally available in hospitals, are undertaken.
 - For other conditions such as more minor injuries, treatment in ambulatory settings might be appropriate, but other types of ambulatory providers (e.g., primary care providers) may not be open or otherwise available (as discussed above).
 - The role that urgent care centers and retail clinics may play in providing an alternative source of care to EDs given their recent proliferation is discussed in Section VI, below.
- For visits with mental health/SUD as a primary diagnosis, almost a quarter are alcohol related, followed by anxiety/fear-related disorders, depressive disorders, suicidal ideation, and schizophrenia.
 - Figure A4 in the Appendix shows that for visits with mental health/SUD as a primary diagnosis, the most common diagnoses for those that end in admission are quite similar to the most common diagnoses for those that are treat-and-release.
- Finally, the visits with mental health/SUD as a secondary diagnosis are a mix of some of the common diagnoses from the other categories, with unspecified chest pain as the most common diagnosis at over 6%, followed by septicemia, abdominal/digestive issues, urinary tract infections, and skin/subcutaneous tissue infections.

Figure 8: Most common diagnoses by type of ED visit, United States, 2018



Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), Nationwide Emergency Department Sample (NEDS), 2019-2018.



ASPE
ASSISTANT SECRETARY FOR
PLANNING AND EVALUATION

OFFICE OF
HEALTH POLICY

Section 5: Efforts to Discourage Overuse of Emergency Departments

Efforts to Discourage Overuse of Emergency Departments

There have been a variety of efforts to discourage “non-emergency” or “inappropriate” ED use. Reviews of the literature on all interventions to decrease non-emergency ED use show mixed results (Raven et al. 2016; Vanden Heede and Van de Voorde 2016). Some examples include higher insurance copayments for ED use as a financial disincentive, patient education to encourage patients to seek care in other settings, expanding access to primary care services, and encouraging other providers to expand access through evening and weekend hours (Uscher-Pines et al. 2013; Hsia and Niedzwiecki 2017). Another strategy that has been implemented in some contexts is to focus on superusers or hotspots. In this strategy, the focus is on the few individuals or communities who use the ED very frequently and therefore are responsible for a disproportionate share of costs. One subset of high utilizers that is sometimes focused on is those patients with mental health/SUD needs. By focusing intensively on these patients, the hope is that health outcomes can be improved while lowering overall costs.

These mixed results in prior literature are consistent with the results of this report shown above in Figure 1, which illustrate that these efforts do not seem to have had widespread or sizeable impacts on overall ED use in general or on the rate of non-MH/SUD treat-and-release ED visits in particular. In addition, researchers have noted that some of these strategies can have unintended negative consequences if they discourage individuals from seeking care when it is truly needed (Uscher-Pines et al. 2013).

Although some observers hypothesized that expanding insurance coverage such as through the Affordable Care Act would decrease ED use (McConville et al. 2018), the numbers in this report as well as other research show that has not been the case (Pines et al. 2016; Sun et al. 2018; Nikpay et al. 2017). Instead, whether ED utilization increases or decreases after gaining insurance coverage seems to depend significantly on the population, the cost-sharing requirements of the insurance, and a number of other factors (Sommers et al. 2017). However, consistent with some other research, we observed a change in the payer mix for visits to the ED, in particular an increase in the proportion of ED visits that were reimbursed by Medicaid (Pines et al. 2016). As expected, some of this increase occurred around the time when Medicaid expansions went into effect; however, the proportion of non-MH/SUD treat-and-release visits attributed to Medicaid grew steadily between 2009 and 2014, before leveling off. Still, when looking within Medicaid, the proportion of ED visits that were non-MH/SUD treat-and-release decreased slightly over time. There was also an expected associated decline around the same time in the proportion of non-MH/SUD treat-and-release visits and mental health/SUD visits that were self-pay/no charge.

Both Congress and HHS have had a long history of concern over the appropriate use of EDs. Below, we provide illustrative examples of HHS efforts to promote appropriate use of EDs.

Centers for Medicare & Medicaid Services

Section 6043 of the Deficit Reduction Act of 2005 authorized \$50 million to the Medicaid program for federal grants to states for emergency room diversion projects. Funds were made available over a four-year period beginning in FY 2006, but awards were not made until April 2008, with priority given to states that targeted medically-underserved areas whose ED utilization rate for non-urgent issues exceeded the state average and to those states who proposed collaboration with local community hospitals. Twenty states with a total of 29 projects participated in the program.⁹ States used these grants to expand access to primary care by establishing alternative sites for non-emergency services, used health information technology to improve the coordination of care, and conducted education and outreach programs to encourage beneficiaries to use the most appropriate setting for care. Although there was no overall evaluation, states were encouraged to submit one-page summaries of their programs.¹⁰ The state experience with these grants helped inform the informational bulletin directed to states, providers, plans and consumers, *Reducing Nonurgent Use of Emergency Departments and Improving Appropriate Care in Appropriate Settings*, issued by the Center for Medicaid Service in January 2014.¹¹ This bulletin proposed three key strategies for reducing inappropriate ED use and provided some examples of previously successful efforts to implement these strategies.

The proposed strategies are:

- 1) expanding access to primary care services,
- 2) focusing on super-utilizers, and
- 3) targeting the needs of people with behavioral health problem.

It also offered advice on differentiating emergencies from non-emergencies.

The Center for Medicare and Medicaid Services (CMS), through the Center for Medicare & Medicaid Innovation (the Innovation Center), develops and tests service and payment models to improve patient care and control costs.

The Emergency Triage, Treat, and Transport Model

The Innovation Center is currently launching the Emergency Triage, Treat, and Transport (ET3) model that will explicitly address ED use. It is a voluntary, five-year payment model whose purpose is to help ambulance care teams better address the health care needs of Medicare Fee-for-Service (FFS) beneficiaries following a 911 call, by giving participants the flexibility to allow transport to an alternative destination, such as a primary care practice, urgent care center or community mental health center, or to initiate treatment, with a health care partner either on site or through telehealth. Through its application process, the Innovation Center had identified 205 potential applicant ambulance services and providers in February 2020 but further implementation of this model has been complicated by the

⁹ Participating states included: Colorado, Connecticut, Georgia, Illinois, Indiana, Louisiana, Massachusetts, Maryland, Michigan, Missouri, North Carolina, North Dakota, New Jersey, Oklahoma, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee and Washington.

¹⁰ These one-page summaries, including findings and sustainability, which can be downloaded here <https://www.medicare.gov/medicaid/quality-of-care/quality-improvement-initiatives/emergency-room-diversion-grant-program/index.html>.

¹¹ See: <https://www.medicare.gov/Federal-Policy-Guidance/Downloads/CIB-01-16-14.pdf>

COVID Public Health Emergency. The Innovation Center expects to issue a Notice of Funding Opportunity early in 2021 for up to 40 two-year cooperative agreements, from the potential applicants that have been identified.¹²

Meanwhile, to respond to the COVID-19 pandemic, for the duration of the public health emergency, CMS expanded the sites to which ambulances may transport patients to include any destination that is able to provide treatment to the patient in a manner consistent with state and local emergency medical services (EMS) protocols in use where the services are being furnished. These destinations may include, but are not limited to: any location that is an alternative site determined to be part of a hospital, community access hospital or skilled nursing facility, community mental health centers, federally qualified health centers, physician's offices, urgent care facilities, ambulatory surgery centers, any other location furnishing dialysis services outside of the ESRD facility, and the beneficiary's home,¹³ thus, allowing for the period of the public health emergency, some of the flexibility intended to be tested through this model.

While the ET3 model is focused on emergency services, throughout its history the Innovation Center has funded models directed at improving the delivery of primary care, with the expectation that they would lead to more appropriate ED use. A systematic review of six Innovation Center primary care models¹⁴ found inconclusive results on this point: four of the 22 settings examined had statistically significant lower outpatient ED visits, while five settings had statistically higher outpatient ED visits. These models varied quite significantly in their structure, focus, methods, and context, and did not focus exclusively or primarily on ED visits, making comparison between models quite challenging. However, overall this evaluation suggested that models that were multi-payer tended to be more successful, that practices (particularly smaller ones) may need financial support for transformation, technical assistance needs to start early and be ongoing, there must be sufficient time to observe the impacts of the models, and there should be sufficient attention to data and comparison groups needed for evaluation. One outcome analyzed in this evaluation was Medicare expenditures before fees (the model included care-management fees to clinicians), although they did not specifically look at changes in spending for EDs specifically. Overall, there was no effect on total Medicare expenditures before fees from the six initiatives, but there was some evidence that these initiatives together may have decreased the growth in Medicare expenditures before fees for beneficiaries with the highest health risk scores and who originally qualified for Medicare due to disability. Although it was not possible in this case to draw overarching conclusions about the differences in each outcome across the 22 settings, the fact that there was so much heterogeneity in outcomes suggests that context and patient characteristics are important and should be taken into account for future models and evaluations.¹⁵

¹² See: <https://innovation.cms.gov/innovation-models/et3>

¹³ See: <https://www.cms.gov/files/document/covid-ambulances.pdf>

¹⁴ "Systematic Review of CMMI Primary Care Initiatives Final Report," Kennell and Associates, Inc and RTI International, February 2018, <https://innovation.cms.gov/files/reports/primarycare-finalevalrpt.pdf> the six models were: the Comprehensive Primary Care (CPC) initiative, the Federally Qualified Health Center (FQHC) Advanced Primary Care Practice demonstration, the Independence at Home (IAH) demonstration, the Multi-Payer Advanced Primary Care Practice (MAPCP) Demonstration, the State Innovation Models (SIM) initiative, and the Health Care Innovation Awards Primary Care Redesign Programs (HCIA-PCR)

¹⁵ Ibid., p. 7, p.63.

The Comprehensive Primary Care Initiative

However, a recently released study that focused on ED use in the Comprehensive Primary Care Initiative, a four-year initiative launched in 2012, found much more promising results.¹⁶ The Comprehensive Primary Care Initiative involved, among other components, providing participating primary care practices support to provide risk-stratified care management, increase access and continuity, plan care for chronic conditions and preventive care, increase patient and caregiver engagement, and coordinate care across medical neighborhoods.¹⁷ Thirty-nine payers and over 500 primary care practices participate in this model. This study found small but consistent improved results for practices participating in the model: 2 percent lower growth in all-cause ED visits than comparison practices; 3 percent lower growth in weekday visits to the ED for visits that could have been treated by a visit to the primary care provider; and lower growth in ED visits that could potentially have been prevented with quality primary care, with no difference between weekdays and non-weekdays.¹⁸ The Comprehensive Primary Care model serves as the foundation for its successful Comprehensive Primary Care+ model, a five-year model launched in 2017, with similar care management practices, including a focus on episodic care management for patients with hospital admissions, ED visits, or conditions likely to benefit from management, and whose participants also experienced reduced ED use in its first year.¹⁹

The Accountable Health Communities Model

In addition, the Innovation Center recently released a preliminary evaluation of the Accountable Health Communities (AHC) Model, which was launched in 2017. This model tests two interventions linking Medicare and Medicaid beneficiaries to community resources to address their social determinants of health with the goal of improving their health. The AHC Model began in May 2017 and will end in April 2022. The Innovation Center funds “bridge organizations” who screen beneficiaries and link them to community resources if they have one or more health-related social needs and have visited the ED two or more times in the 12 months before screening. Those who are eligible for additional assistance are randomly assigned to either receive the treatment (community referral and navigation) or to the control group to receive their usual care. The Innovation Center has released preliminary, interim results of the model, which primarily focus on the success of the navigation and screening, and while it is too early to

¹⁶ Pathways to reduced emergency department and urgent care center use: Lessons from the comprehensive primary care initiative,” L. Timmins, D. Piekas, N. McCall; *Health Services Research*, November 30, 2020 (online ahead of print), <https://onlinelibrary.wiley.com/doi/10.1111/1475-6773.13579>

¹⁷ More details on this model are available here <https://innovation.cms.gov/innovation-models/comprehensive-primary-care-initiative>.

¹⁸ See: <https://www.mathematica.org/news/pathways-to-reduced-emergency-department-and-urgent-care-center-use-lessons-from-the-comprehensive>

¹⁹ Independent Evaluation of Comprehensive Primary Care Plus (CPC+) First Annual Report Supplemental Volume, Mathematica, April 2019, p. 185. Report available here <https://downloads.cms.gov/files/cmimi/cpcplus-first-ann-rpt-supp-rpt.pdf>.

know the final impact the model will have, initial data showed a 9 percent decrease in ED visits for Medicare beneficiaries in the treatment group compared to the control group.²⁰

Preliminary results from some of these models show promise for the potential role of value-based purchasing initiatives, such as those supported by the Innovation Center, to encourage more appropriate use of ED services. Their impact at the national level, however, has yet to be determined.

Substance Abuse and Mental Health Services Administration

The adverse effects of “psychiatric boarding,” that is the holding of a behavioral health patient in the ED, while an inpatient bed or other appropriate placement is sought, on patient health and hospital finances and staff resources have long been acknowledged,²¹ yet the problem persists, fueled by the past decrease in in-patient psychiatric beds, the increase in opioid use disorder cases and inadequate community-based alternatives. In response, the Substance Abuse and Mental Health Service Administration has issued several documents outlining the appropriate use and best practices for reducing behavioral health treatment in EDs, including the February 2020 “National Guidelines for Behavioral Health Crisis Care,”²² a best practices toolkit for providers, communities and the general public. The toolkit has been combined with related papers contributed by industry addressing key issues relevant to crisis services, homelessness, technology advances, substance use, legal issues impacting crisis services, financing crisis care, diverse populations, children and adolescents, rural and frontier areas, and the role of law enforcement and released as a book, on December 9, 2020.²³

Urgent Care Centers, Retail Clinics, and Health Centers

In recent years, the number of urgent care centers and retail clinics has increased, and these sites serve as potential alternatives to the emergency room. Urgent care centers provide care for many common illnesses and non-emergency conditions and are generally staffed by primary care physicians and advanced practice nurses. Retail clinics are generally located within supermarkets, drug stores, and other commercial establishments, are often staffed by nurse practitioners. They both provide care for acute health problems as well as preventive care such as immunizations. Unlike EDs, these types of locations are not required to care for all patients regardless of insurance status or ability to pay. They generally do not require appointments and are frequently open longer than other primary care providers, typically seven days a week, with extended evening hours. Therefore, they can fill a gap for patients whose condition does not require a visit to the ED but whose regular providers are closed or for those who do not have a regular source of care. Utilization of these sites is already significant and has been growing in recent years. One analysis of Aetna members under age 65 showed from 2008 to 2015 a 119% increase in visits to urgent care centers (47 visits per 1,000 members to 103 per 1,000 members)

²⁰ The full, preliminary evaluation is available here <https://innovation.cms.gov/data-and-reports/2020/ahc-first-eval-rpt>.

²¹ See: B. A. Nicks, D. M. Manthey, "The Impact of Psychiatric Patient Boarding in Emergency Departments", *Emergency Medicine International*, vol. 2012, Article ID 360308, 5 pages, 2012. <https://doi.org/10.1155/2012/360308>

²² <https://www.samhsa.gov/sites/default/files/national-guidelines-for-behavioral-health-crisis-care-02242020.pdf>

²³ https://store.samhsa.gov/sites/default/files/product_thumbnails/crisis-cover_0.jpg

and a 214% increase in visits to retail clinics (7 visits per 1,000 members to 22 visits per 1,000 members), along with a 36% decrease in visits to the ED (89 visits per 1,000 members to 57 visits per 1,000 members) (Poon et al. 2018). The National Center for Health Statistics reports that in 2019 one in four children had a visit to an urgent care center or retail clinic, and their use is highest among non-Hispanic White children, children with private or public health insurance (compared to children who were uninsured), and among children with parents with greater education and income (Black and Zablotsky 2020). These patterns of utilization may be partly driven by the fact that urgent care clinics are not equally distributed but instead tend to be located in urban areas, higher income areas, and areas with higher rates of private insurance coverage (Le and Hsia 2016). There is some evidence that suggests that diverting these types of visits from EDs to these sites has the potential for a significant impact on cost (Weinick et al. 2013), but they may also provide care to individuals who otherwise would not seek care at all. There is some initial evidence that these clinics may be a substitute for EDs in certain populations under certain conditions, but the overall impact on ED use or cost remains to be seen (Allen et al. 2019).

In addition to urgent care centers and retail clinics, which typically offer a limited set of services, the number of federally funded health center grantees and their service sites has also expanded in recent years. Community health centers are community-based, non-profit organizations that by statute provide comprehensive primary care services to medically underserved areas or populations.²⁴ Community health centers always provide primary medical care and often also provide pharmacy, mental health, substance abuse, and oral health services coupled with enabling services, such as case management, outreach and enrollment support, transportation, interpretation and health education, to help ensure that clients are able to access the health care they need. Between 2010 and 2018 the number of community health center sites increased from 6,949 to approximately 11,744, and the number of patients they served increased by approximately 46% from 19.5 million to 28.4 million (National Association of Community Health Centers 2020). There is some evidence that rural counties with a community health center have lower ED use among the uninsured compared to rural counties without a community health center (Rust et al. 2008) and that greater access to or funding for community health centers and federally qualified health centers may result in lower ED use (Myong et al. 2020; Denham et al. 2013).

²⁴ Federally funded health centers include entities such as community health centers, migrant health centers, and health centers for residents of public housing that receive federal funds. There is significant overlap between this category of entities and federally qualified health centers (FQHCs), which is a broader term that was primarily created for the purposes of Medicare and Medicaid reimbursement. FQHCs also include some entities that are not health centers, such as outpatient health programs operated by a tribe, tribal organization, or urban Indian organization.



OFFICE OF
HEALTH POLICY

Section 6: Conclusions

Conclusions

There has been concern about “overuse” or “inappropriate” use of EDs for many years, but it is challenging to determine what is “appropriate” utilization, particularly when there are also issues of accessibility. This is a challenge both for researchers as well as for policymakers attempting to affect patterns of ED use. Using 10 years of data from HCUP we find that despite concern over ED utilization, there has not been any sizeable change in overall rates of utilization nationally during the years studied (2009 to 2018). However, over that time period, particularly between 2009 and 2015, there was an increase in the rate of visits associated with mental health/SUD diagnoses, likely reflecting, in part, the opioid epidemic. One theme that recurs frequently when discussing ED capacity is the reliance on the ED by many patients for mental health/SUD treatment, and related challenges. Providing treatment for such patients can be complex and resource intensive and when hospitalization is required there are not always sufficient beds in hospitals for these patients. Additional behavioral health and SUD treatment resources, or enhanced supports and access to existing resources, as well as additional consideration of how to address social determinants of health such as homelessness that may be playing a role, may be needed in communities exhibiting high reliance on hospitals to provide such services.

We found variation in ED utilization by patient characteristics as well as by patient residence and community characteristics. This report showed, for instance, that patients with rural residences had similar rates of non-MH/SUD ED visits ending in a hospital admission compared to patients from other geographies, but rural hospitals had higher rates of non-MH/SUD treat-and-release visits relative to hospital admission visits. This may indicate that when rural patients need care that may result in a hospital admission, they are more likely to obtain that care at a distant hospital. We did not attempt to assess the extent to which this may reflect patients bypassing their local hospital even though services may be available there.

We found that ED visit rates, overall, were highest for patients in communities with lower median income and greater social vulnerability, but the proportion of visits by category did not differ significantly by median community income or community social vulnerability. However, we were not able to analyze the effect of these measures at the individual level. It is possible that within communities, the proportion of visits by category might vary for individuals with different levels of income or social vulnerability.

We found that the proportion of ED visits covered by various payers seems to have generally reflected changes in the rates of health insurance coverage (particularly related to Medicaid expansion and associated declines in the proportion of visits that were self-pay) and the aging of the population during the study window. We also observed variation between states in ED utilization that is different depending on the type of utilization, suggesting that state-based policies may be important for ED utilization.

Additional research is needed on many of the issues raised in this report, particularly on the drivers underlying the use of EDs for mental health/SUD visits and primary care and how these issues might be addressed. Such research could inform consideration of the “appropriate” role of EDs in the future and why patients may be seeking care in this setting. Whether value-based purchasing initiatives, such as those supported by the CMS Innovation Center that have some promising findings, will affect ED utilization at a national level has yet to be determined. The assessment of their effects at the national

level will be complicated by the COVID-19 pandemic, which has dramatically affected the health care landscape, including utilization of EDs, and which may have effects that extend beyond the pandemic (Hartnett et al. 2020).

Appendix

Data Sources

HCUP NEDS, SID, and SEDD

The NEDS is a database that provides national estimates of ED visits. It relies on data from community hospitals, which includes short-term, non-Federal, general, and other hospitals and excludes hospital units contained within other institutions as well as long-term care facilities. The unit of analysis in this data is the encounter, so an individual can be counted more than once if they visit an ED more than one time during a year. The NEDS is constructed by using data from the State Emergency Department Databases and State Inpatient Databases and has been produced annually since 2006. However, the number of states contributing has varied over time.²⁵ States and their participation in NEDS for the years included in this report are shown in the following Table A1. To calculate the rate of ED visits per 100,000 people, population data from Claritas, a vendor who uses data from the U.S. Census Bureau to derive population estimates.²⁶

²⁵ More information on HCUP and on all available data products can be found at www.hcup-us.ahrq.gov. More detailed information about the NEDS can be found at www.hcup-us.ahrq.gov/nedsoverview.jsp and a description of data elements can be found at <https://www.hcup-us.ahrq.gov/db/nation/neds/nedsdde.jsp>.

²⁶ More information on Claritas is available here <https://claritas360.claritas.com/mybestsegments/>.

Table A1: State participation in NEDS by year, 2009-2018

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Alabama										
Alaska										
Arizona	X	X	X	X	X	X	X	X	X	X
Arkansas					X	X	X	X	X	X
California	X	X	X	X	X	X	X	X	X	X
Colorado									X	X
Connecticut	X	X	X	X	X	X	X	X	X	X
Delaware										
District of Columbia							X	X	X	X
Florida	X	X	X	X	X	X	X	X	X	X
Georgia	X	X	X	X	X	X	X	X	X	X
Hawaii	X	X	X	X	X	X	X	X		
Idaho										
Illinois	X	X	X	X	X	X	X	X	X	X
Indiana	X	X	X	X	X	X	X	X	X	X
Iowa	X	X	X	X	X	X	X	X	X	X
Kansas	X	X	X	X	X	X	X	X	X	X
Kentucky	X	X	X	X	X	X	X	X	X	X
Louisiana										
Maine	X		X	X		X	X	X	X	X
Maryland	X	X	X	X	X	X	X	X	X	X
Massachusetts	X	X	X	X	X	X	X	X	X	X
Michigan										X
Minnesota	X	X	X	X	X	X	X	X	X	X
Mississippi								X	X	X
Missouri	X	X	X	X	X	X	X	X	X	X
Montana						X	X	X	X	X
Nebraska	X	X	X	X	X	X	X	X	X	X
Nevada		X	X	X	X	X	X	X	X	X
New Hampshire	X									
New Jersey	X	X	X	X	X	X	X	X	X	X
New Mexico										
New York	X	X	X	X	X	X	X	X	X	X
North Carolina	X	X	X	X	X	X	X	X	X	X
North Dakota			X	X	X	X	X	X	X	X
Ohio	X	X	X	X	X	X	X	X	X	X
Oklahoma										
Oregon								X	X	X
Pennsylvania										
Rhode Island	X	X	X	X	X	X	X	X	X	X
South Carolina	X	X	X	X	X	X	X	X	X	X
South Dakota	X	X	X	X	X	X	X	X	X	X
Tennessee	X	X	X	X	X	X	X	X	X	X
Texas							X	X	X	X
Utah	X	X	X	X	X	X	X	X	X	
Vermont	X	X	X	X	X	X	X	X	X	X
Virginia										
Washington										
West Virginia										
Wisconsin	X	X	X	X	X	X	X	X	X	X
Wyoming						X	X	X	X	X

Source for state participation information: HCUP website, available here https://www.hcup-us.ahrq.gov/db/PartnerParticipation_CD.pdf

Expected primary payer for the hospital stay:

- Medicare: includes fee-for-service and managed care
- Medicaid: includes fee-for-service and managed care
- Private insurance: includes commercial insurance
- Uninsured: includes self-pay and no charge
- Other: includes TRICARE/CHAMPUS, CHAMPVA, Title V, Workers' Compensation, and other governmental programs

Age: Age in years at admission

Female: Indicator of sex

Hospital region: Census region of the hospital, obtained from the American Hospital Association Annual Survey of Hospitals.

Hospital urban-rural designation: Urban-rural classification based on hospital zip-code; this classification is a simplified four-level version of the Urban Influence Codes from U.S. Department of Agriculture.

Patient urban-rural designation: Urban-rural classification based on patient county using a classification scheme developed by the National Center for Health Statistics which draws on information from the Office of Management and Budget and is refined using Rural-Urban Continuum Codes and Urban Influence Codes from the U.S. Department of Agriculture as well as county characteristics from the Census Bureau.

Median household income for patient's zip code: Quartile classification of the median household income of residents in the patient's zip code (values of 1 to 4).

Hospital ownership: Obtained from the AHA Annual Survey of Hospitals, includes public, private not-for-profit, and private for-profit.

Admissions: ED visits that ended with the patient being admitted to that hospital. For these analyses, ED visits that have mental health/SUD as a principal/first-listed diagnosis or a secondary diagnosis are excluded from this category.

Treat-and-release: ED visits that ended in the patient being released, rather than admitted. For these analyses, ED visits that have mental health/SUD as a principal/first-listed diagnosis or a secondary diagnosis are excluded from this category.

Mental health/SUD visits: ED visits (regardless of whether they end in an admission or a release) that have mental health/SUD as a principal/first-listed diagnosis or a secondary diagnosis. For treat-and-release visits, the first-listed diagnosis is the condition, symptom, or problem identified in the medical record to be chiefly responsible for the ED services provided. For those ED visits that end in admission to the same hospital, the principal diagnosis is similarly the condition primarily responsible for the patient's admission. For treat-and-release visits, secondary diagnoses are coexisting conditions at the time of the visit that require or affect patient care or treatment. For admissions, secondary diagnoses are those that coexist at the time of admission or subsequently develop or that affect treatment and exclude those related to earlier episodes which do not affect the current visit.²⁷ AHRQ uses clinical classification software (CCS) and clinical classification software refined (CCSR) to sort diagnosis codes from the International Classification of Diseases (9th and 10th Revision, depending on the year, see below) into clinically meaningful categories.²⁸ The CCS categories used to identify mental health/SUD

²⁷ Detailed definitions for these diagnosis categories can be found in the Uniform Hospital Discharge Data Set.

²⁸ Information about CCS and CCS refined used by HCUP can be found here https://hcup-us.ahrq.gov/toolssoftware/ccsr/ccs_refined.jsp.

diagnoses for 2009-2015 were adjustment disorders; anxiety disorders; attention-deficit, conduct, and disruptive behavior disorders; delirium, dementia, and amnesic and other cognitive disorders; disorders usually diagnosed in infancy, childhood, or adolescence; impulse control disorders not elsewhere classified; mood disorders; personality disorders; schizophrenia and other psychotic disorders; alcohol-related disorders; substance-related disorders; suicide and intentional self-inflicted injury; and miscellaneous mental health disorders. The CCSR categories used to identify mental health/SUD diagnoses for 2016-2018 were: schizophrenia spectrum and other psychotic disorders; depressive disorders; bipolar and related disorders; other specified and unspecified mood disorders; anxiety and fear-related disorders; trauma- and stressor-related disorders; disruptive, impulse-control, and conduct disorders; personality disorders; feeding and eating disorders; somatic disorders; suicidal ideation/attempt/intentional self-harm; miscellaneous mental and behavioral disorders/conditions; alcohol-related disorders; opioid-related disorders; cannabis-related disorders; sedative-related disorders; stimulant-related disorders; hallucinogen-related disorders; inhalant-related disorders; and other specified substance-related disorders.

On October 1, 2015, all providers covered by HIPAA were required to transition from ICD-9-CM to ICD-10-CM. The categories of diagnoses included in ICD-10-CM are not always the same or easily mapped to those included in ICD-9-CM. As a result, some care must be taken when comparing categories of diagnoses or counts across time. For this reason, for these categories, the analysis uses the first three quarters of 2015 (prior to the ICD transition).²⁹

This report would not be possible without the contributions to HCUP of the following data collection Partners from across the United States: Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, District of Columbia, Florida, Georgia, Hawaii, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin, Wyoming. More information on contributing data collection partners can be found here <https://hcup-us.ahrq.gov/partners.jsp?SID>.

CDC Social Vulnerability Index

The SVI is developed by the CDC using 15 variables from the U.S. Census to identify potentially vulnerable communities (in this case, patient census tract). The SVI is made up of four components: socioeconomic status, household composition, race/ethnicity/language, and housing/transportation. The variables that go into the socioeconomic status component are being below poverty, being unemployed, income, and not having a high school diploma. The variables that go into the household composition component are having someone in the household who is aged 65 or older, children in the household, having someone in the household aged 5 and above with a disability, and being a single-parent household. The variables that go into the minority status/language component are being a

²⁹ More information on the transition and its impact can be found here https://hcup-us.ahrq.gov/datainnovations/icd10_resources.jsp.

minority and speaking English “less than well.” The variables that go into the housing type/transportation component are living in a multi-unit structure, living in a mobile home, crowding, having no vehicle, and living in group quarters.³⁰ For the purposes of this report, patients’ communities were grouped into quartiles in terms of their SVI score, from lowest (least vulnerable) to highest (most vulnerable).

³⁰ More information on the SVI can be found here: <https://www.atsdr.cdc.gov/placeandhealth/svi/index.html>.

Supplementary Tables and Figures

Table A2: ED visits (rate and percent) by visit type, United States, 2009-2018

	Per 100,000 persons									
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Total ED visits	42,043	41,733	42,185	42,926	42,834	43,445	45,010	44,922	44,539	43,933
Non-MH/SUD admissions	4,166	4,106	4,041	3,848	3,804	3,612	3,608	3,847	4,008	3,941
Non-MH/SUD treat-and-release	32,349	31,774	32,024	32,745	32,362	32,689	33,923	34,782	33,703	33,087
Mental health/SUD	5,529	5,853	6,121	6,332	6,668	7,145	7,479	6,293	6,828	6,905
	Percent of all ED visits									
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Non-MH/SUD admissions	9.9%	9.8%	9.6%	9.0%	8.9%	8.3%	8.0%	8.6%	9.0%	9.0%
Non-MH/SUD treat-and-release	76.9%	76.1%	75.9%	76.3%	75.6%	75.2%	75.4%	77.4%	75.7%	75.3%
Mental health/SUD	13.1%	14.0%	14.5%	14.8%	15.6%	16.4%	16.6%	14.0%	15.3%	15.7%

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), Nationwide Emergency Department Sample (NEDS), 2019-2018. The mental health/SUD categorization relies on ICD-9-CM codes from 2008 until the third quarter of 2015 and ICD-10-CM codes from 2016 to 2018. There are known discontinuities between these two coding systems that include a transition period as the new codes were adopted. For this reason, care should be taken in interpreting changes before and after the ICD transition.

Table A3: Rate and Percent of ED admission by type and community characteristics, United States 2018

	Median community income							
	1 st quartile		2 nd quartile		3 rd quartile		4 th quartile	
	Rate per 100,000 persons	Percent	Rate per 100,000 persons	Percent	Rate per 100,000 persons	Percent	Rate per 100,000 persons	Percent
Non-MH/SUD admissions	5,136	8.0%	3,941	8.5%	3,363	9.7%	3,132	11.1%
Non-MH/SUD treat-and-release	49,157	76.7%	35,445	76.1%	25,809	74.5%	20,439	72.7%
Mental health/SUD	9,758	15.2%	7,167	15.4%	5,456	15.8%	4,546	16.2%
	Community social vulnerability							
	1 st quartile		2 nd quartile		3 rd quartile		4 th quartile	
	Rate per 100,000 persons	Percent	Rate per 100,000 persons	Percent	Rate per 100,000 persons	Percent	Rate per 100,000 persons	Percent
Non-MH/SUD admissions	2,889	9.1%	3,692	8.4%	4,248	9.3%	4,888	9.2%
Non-MH/SUD treat-and-release	23,621	74.0%	32,866	75.1%	34,754	75.8%	34,754	76.1%
Mental health/SUD	5,401	16.9%	7,214	16.5%	6,839	14.9%	7,809	14.7%

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), Nationwide Emergency Department Sample (NEDS), 2019-2018 and the CDC Social Vulnerability Index.

Figure A1: % of ED visits by expected payer, United States, 2018

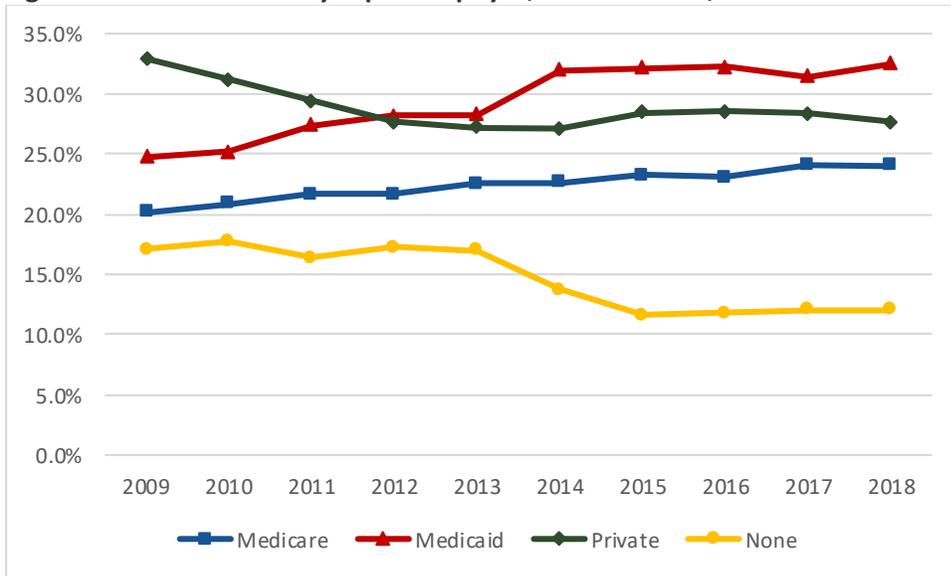
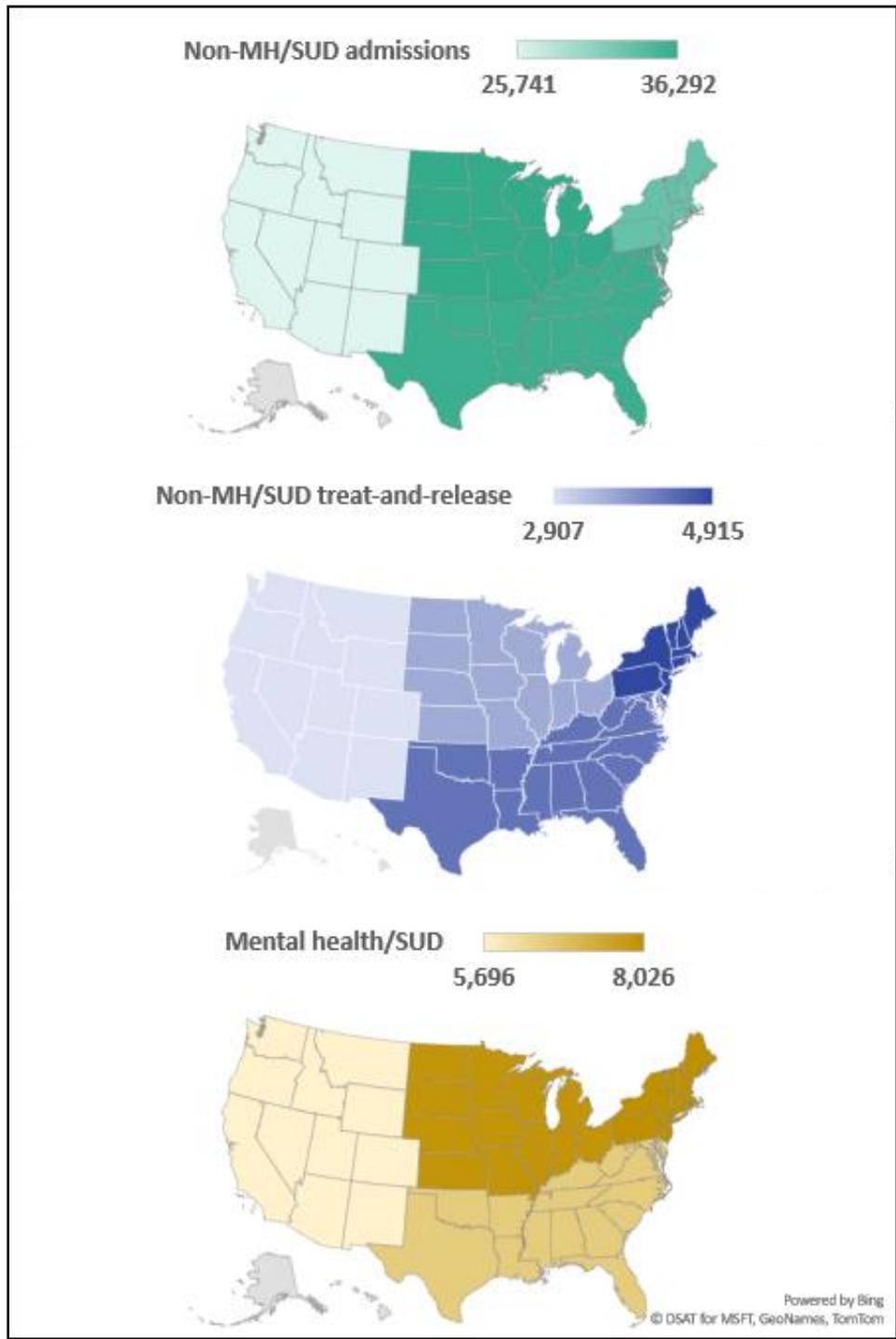


Figure A2: ED visits per 100,000 persons by type and region, United States, 2018



Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Emergency Department Databases (SEDD), and State Inpatient Databases (SID), 2019-2018. Regions are based on U.S. Census Bureau definitions.

Table A4: Non-MH/SUD ED visits ending in admission by state, United States, 2009-2018

	2009	2010	2011	2012	2013	2014	2015 ^a	2016	2017	2018
Arizona	262,102	263,944	257,702	245,114	233,922	227,753	166,764	230,596	229,264	246,977
Arkansas					105,541	107,758	82,629	126,498	126,687	128,282
California	1,171,922	1,178,396	1,162,853	1,152,539	1,130,730	1,100,994	846,756	1,265,796	1,295,694	1,295,823
Colorado									144,814	149,252
Connecticut	142,900	141,991	142,392	136,191	130,052	127,287	96,889	139,581	139,052	136,733
District of Columbia							33,440	45,625	44,942	42,686
Florida	989,916	1,003,904	1,020,988	1,028,685	1,020,369	1,045,785	802,949	1,204,569	1,198,615	1,208,463
Georgia	321,800	319,583	313,423	313,584	317,425	317,628	244,753	377,510	397,406	414,016
Hawaii	38,757	41,369	39,566	41,845	41,004	40,889	32,059	47,613		
Illinois	526,787	498,601	472,061	465,263	446,195	432,456	322,906	512,447	506,164	511,314
Indiana	228,234	225,571	222,028	222,256	209,643	204,794	154,913	225,871	223,809	232,597
Iowa	93,677	89,032	85,561	82,549	79,574	79,962	61,699	85,744	87,141	84,907
Kansas	80,109	70,664	62,771	65,074	67,059	69,288	54,679	85,996	87,110	85,757
Kentucky	187,551	181,586	176,383	170,438	161,209	157,209	119,935	182,399	181,606	177,507
Maine	50,662		40,551	42,780		39,726	32,300	39,457	41,374	40,449
Maryland	258,537	244,776	234,259	229,133	216,886	208,033	150,134	217,807	210,268	203,927
Massachusetts	292,678	288,824	292,074	275,028	259,177	246,457	185,989	291,883	295,842	296,811
Michigan										386,100
Minnesota	142,191	137,070	130,811	125,833	119,701	121,647	91,080	135,518	142,213	148,194
Mississippi								133,317	134,573	134,416
Missouri	257,386	247,294	237,878	227,569	220,173	214,758	161,147	235,584	237,649	240,412
Montana						19,598	15,417	22,325	23,965	24,265
Nebraska	50,067	49,201	48,034	47,096	46,851	46,309	30,361	43,523	45,497	46,036
Nevada		108,758	98,726	99,473	105,319	103,135	80,286	120,497	130,291	136,249
New Hampshire	36,181									
New Jersey	447,816	423,961	416,375	400,985	384,960	371,320	272,506	405,561	390,678	390,250
New York	1,056,281	1,018,026	974,557	928,097	875,175	835,314	608,280	910,787	949,188	922,607
North Carolina	377,798	362,301	346,814	324,264	302,915	289,729	217,576	331,947	342,253	354,832
North Dakota			19,447	17,970	16,627	17,952	14,037	20,066	20,746	20,603
Ohio	478,468	382,330	368,992	456,419	418,191	425,405	327,153	483,736	491,141	487,809
Oregon								100,525	102,962	104,638
Rhode Island	49,578	38,280	37,660	40,592	31,261	23,883	36,287	36,839	37,281	
South Carolina	165,825	164,571	164,317	164,484	162,937	162,305	129,158	197,263	202,565	206,934
South Dakota	21,324	20,536	20,187	20,338	20,074	18,919	14,470	22,747	23,632	23,656
Tennessee	280,098	259,864	260,114	223,762	225,416	212,647	167,906	251,239	292,078	295,601
Texas							712,988	1,061,070	1,075,983	1,117,114
Utah	62,180	60,824	64,108	65,117	64,698	60,082	46,758	66,664	67,316	
Vermont	16,042	14,451	14,147	14,351	14,100	12,920	10,232	16,131	16,188	16,416
Wisconsin	160,999	149,073	147,882	148,366	144,158	139,165	104,647	151,881	152,600	153,300
Wyoming						11,621	8,634	13,256	13,311	12,507

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Emergency Department Databases (SEDD), and State Inpatient Databases (SID), 2019-2018 and the Census Bureau.

^a Due to the ICD transition, for 2015 data is reported only for quarters 1 through 3. For a more detailed explanation, see *Data sources* section in Appendix (above).

Table A5: Non-MH/SUD treat-and-release ED visits by state, United States, 2009-2018

	2009	2010	2011	2012	2013	2014	2015 ^a	2016	2017	2018
Arizona	1,692,183	1,672,689	1,760,332	1,811,715	1,767,015	1,870,294	1,465,675	2,067,515	1,924,316	1,987,535
Arkansas					1,035,156	1,069,333	805,864	1,084,702	1,108,258	1,062,601
California	8,829,397	8,557,542	8,724,693	9,121,384	9,382,576	9,814,204	7,921,484	11,028,960	11,258,048	10,991,830
Colorado									1,655,975	1,637,644
Connecticut	1,276,624	1,246,041	1,288,813	1,290,097	1,212,036	1,201,954	888,061	1,185,340	1,152,121	1,126,357
District of Columbia							253,060	326,382	326,211	298,673
Florida	5,994,209	6,032,947	6,285,510	6,748,942	6,895,038	7,306,752	5,697,302	8,157,399	8,112,312	8,181,947
Georgia	3,409,331	3,372,793	3,448,676	3,651,808	3,546,682	3,574,076	2,729,216	3,790,693	3,813,076	3,833,520
Hawaii	323,767	318,236	313,230	342,502	364,387	381,180	293,823	409,234		
Illinois	3,793,276	3,757,605	3,928,964	4,050,327	3,847,702	3,966,363	3,030,535	4,049,109	3,984,913	3,924,124
Indiana	2,418,561	2,376,959	2,403,410	2,467,168	2,453,547	2,429,983	1,855,271	2,556,273	2,489,872	2,384,663
Iowa	956,162	951,924	983,406	994,330	973,749	1,003,261	775,716	1,030,245	1,027,392	994,924
Kansas	773,391	729,812	728,738	751,095	773,876	789,966	617,085	920,347	870,820	842,914
Kentucky	1,919,628	1,909,487	1,920,843	1,897,625	1,789,195	1,868,226	1,465,806	1,975,195	1,824,296	1,735,869
Maine	608,563		576,885	567,599	510,532	375,531	507,282	483,544	460,263	
Maryland	1,847,912	1,753,057	1,822,209	1,917,951	1,852,483	1,847,052	1,368,357	1,800,996	1,716,297	1,655,172
Massachusetts	2,293,201	2,198,218	2,216,458	2,235,569	2,140,176	2,113,911	1,584,401	2,140,713	2,101,139	2,063,339
Michigan										3,195,908
Minnesota	1,421,287	1,408,356	1,476,816	1,371,513	1,320,641	1,412,092	1,089,797	1,488,798	1,493,076	1,478,145
Mississippi										3,195,908
Missouri	2,181,109	2,120,512	2,155,569	2,185,613	2,073,562	2,134,690	1,663,229	2,297,156	2,635,617	2,506,207
Montana						228,402	185,660	251,776	262,221	264,436
Nebraska	434,047	426,134	425,903	433,335	432,770	438,571	325,607	434,350	431,805	428,053
Nevada		639,733	673,225	705,090	734,834	779,786	628,254	859,484	903,972	882,610
New Hampshire	503,879									
New Jersey	2,606,960	2,536,408	2,615,942	2,705,422	2,683,999	2,705,506	2,078,182	2,785,615	2,684,348	2,631,051
New York	5,804,527	5,719,577	5,905,737	6,015,573	5,944,362	5,990,454	4,547,693	6,222,491	6,084,886	5,924,979
North Carolina	3,302,547	3,165,636	3,241,035	3,465,685	3,520,459	3,585,881	2,726,272	3,716,177	3,710,927	3,673,023
North Dakota	0	0	0	171,440	186,708	175,179	207,564	159,945	206,212	210,128
Ohio	4,939,869	4,770,454	4,904,429	5,392,939	5,043,071	5,283,535	4,056,664	5,720,371	5,412,917	5,243,644
Oregon								1,171,890	1,168,650	1,181,474
Rhode Island	363,911	347,976	351,479	354,814	258,010	367,927	339,087	339,907		
South Carolina	1,697,594	1,646,702	1,682,307	1,796,134	1,837,905	1,879,063	1,449,169	2,022,542	2,019,425	1,955,663
South Dakota	132,871	129,506	132,056	143,561	171,105	170,997	136,493	183,898	170,516	184,477
Tennessee	2,492,495	2,391,209	2,451,120	2,350,292	2,282,727	2,139,147	1,645,635	2,287,896	2,522,272	2,462,841
Texas							5,986,550	8,262,436	8,337,400	8,550,686
Utah	619,196	576,814	601,874	604,553	609,231	628,799	490,769	681,064	657,669	
Vermont	208,191	210,493	215,191	224,810	218,643	214,107	164,214	216,436	212,155	211,961
Wisconsin	1,504,672	1,519,445	1,480,529	1,493,371	1,464,730	1,528,362	1,194,248	1,692,363	1,666,209	1,642,878
Wyoming						161,459	116,693	156,144	158,613	155,289

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), Nationwide Emergency Department Sample (NEDS), State Emergency Department Databases (SEDD), and State Inpatient Databases (SID), 2019-2018 and the Census Bureau.

^a Due to the ICD transition, for 2015 data is reported only for quarters 1 through 3. For a more detailed explanation, see *Data sources* section in Appendix (above).

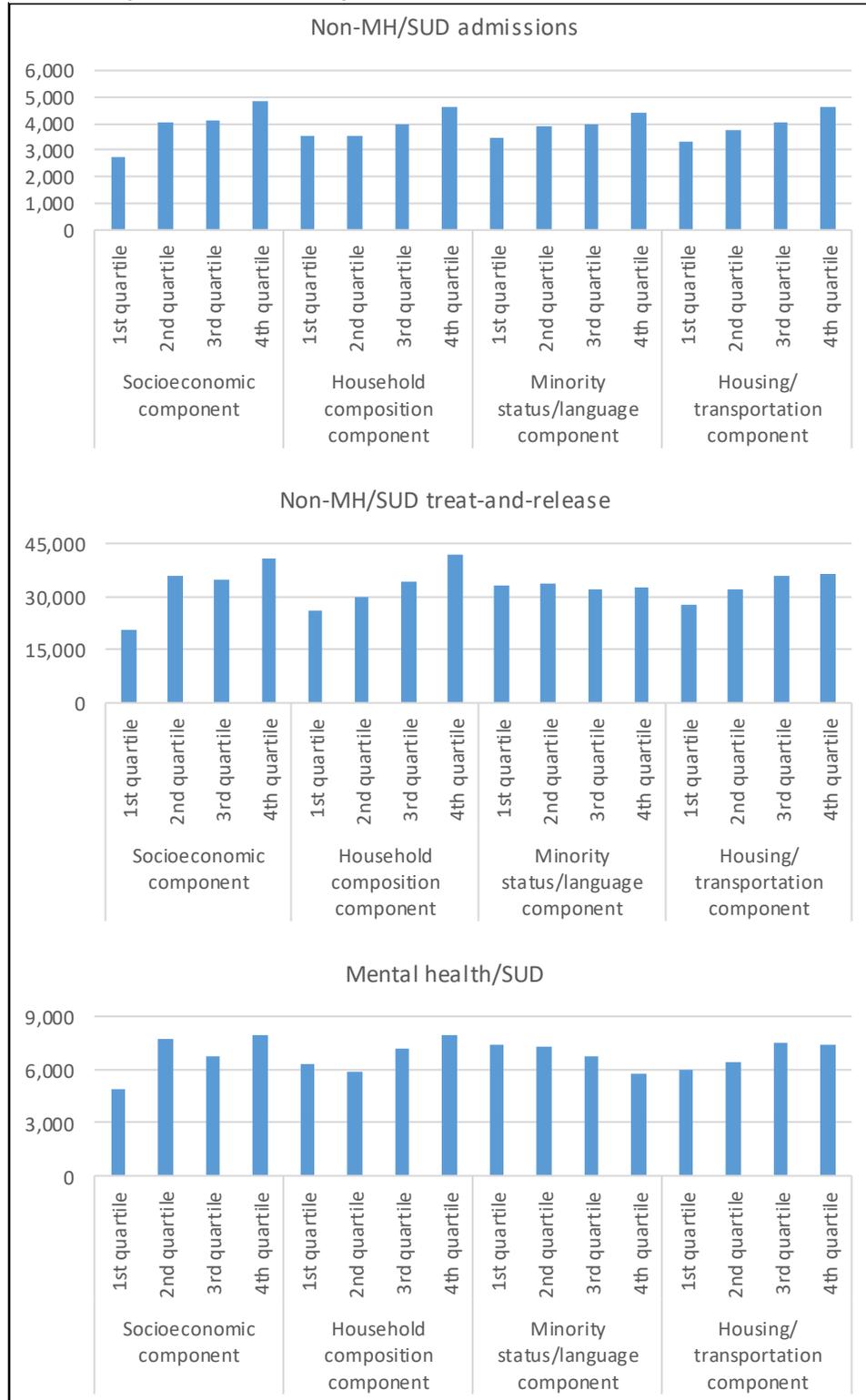
Table A6: Mental health/SUD ED visits by state, United States, 2009-2018

	2009	2010	2011	2012	2013	2014	2015 ^a	2016	2017	2018
Arizona	327,405	368,780	398,519	419,379	431,368	471,035	381,091	484,919	467,807	482,632
Arkansas					186,137	195,019	158,627	179,598	183,100	188,560
California	1,546,275	1,697,504	1,864,431	2,084,015	2,170,971	2,339,219	1,910,208	2,215,552	2,254,334	2,293,320
Colorado									349,696	366,730
Connecticut	229,907	244,571	261,253	277,336	273,134	273,849	219,904	267,753	266,750	282,094
District of Columbia							55,277	67,398	64,929	58,481
Florida	1,055,080	1,136,649	1,201,086	1,263,706	1,279,337	1,412,089	1,159,236	1,357,265	1,416,171	1,474,931
Georgia	466,522	502,226	538,887	560,498	558,918	603,417	477,816	568,773	617,291	645,812
Hawaii	45,468	54,760	53,731	58,173	58,377	68,761	52,983	59,165		
Illinois	657,741	698,992	739,461	789,436	799,028	846,358	688,557	816,134	820,586	839,748
Indiana	332,587	357,513	387,147	401,423	402,644	426,113	343,474	419,556	484,804	512,554
Iowa	126,106	99,942	102,044	111,891	106,675	111,489	102,183	120,881	197,414	203,638
Kansas	106,013	115,777	123,949	139,128	144,862	154,256	118,519	142,512	165,124	186,640
Kentucky	289,579	313,871	335,917	361,938	371,109	411,445	331,367	409,650	409,917	425,615
Maine	119,572	0	115,522	111,860	0	110,656	92,496	109,633	123,389	
Maryland	401,574	410,926	441,710	472,143	460,762	472,851	379,960	449,979	482,835	499,918
Massachusetts	454,517	480,686	500,171	522,027	532,933	548,243	450,251	553,179	566,854	597,532
Michigan										807,153
Minnesota	257,159	276,583	287,328	292,064	309,607	332,255	261,140	316,172	340,052	350,258
Mississippi										807,153
Missouri	368,915	402,622	431,250	493,381	508,054	551,023	426,315	504,248	518,617	524,962
Montana						58,105	47,292	63,200	63,936	65,779
Nebraska	57,192	61,523	64,308	66,024	71,928	78,375	72,269	94,396	99,966	110,387
Nevada		142,786	152,527	160,435	176,416	198,250	167,356	220,482	226,828	241,056
New Hampshire	87,286									
New Jersey	511,217	536,704	561,253	596,888	593,662	604,500	490,390	600,328	615,965	615,250
New York	1,054,237	1,106,983	1,212,475	1,250,882	1,281,733	1,356,212	1,049,749	1,254,484	1,327,832	1,361,116
North Carolina	599,267	597,764	639,184	709,619	762,616	797,367	643,595	783,408	820,037	811,320
North Dakota	0	0	30,685	31,883	33,225	41,174	35,262	48,831	52,455	53,403
Ohio	803,992	776,728	812,518	1,010,585	1,016,743	1,112,276	912,880	1,129,302	1,104,700	1,101,398
Oregon								259,344	263,560	267,243
Rhode Island	91,991	89,891	90,447	105,099	32,642	86,073	101,686	101,370		
South Carolina	262,504	292,003	317,364	322,876	322,118	350,067	270,461	315,568	324,791	337,483
South Dakota	25,821	25,726	26,345	30,603	35,927	37,655	29,805	38,449	34,972	37,357
Tennessee	370,857	398,439	414,655	406,957	413,034	403,732	340,731	403,133	445,110	454,982
Texas							1,093,459	1,280,829	1,328,294	1,416,447
Utah	91,438	97,483	90,897	90,882	93,213	107,490	93,560	115,532	124,092	
Vermont	38,734	38,278	37,658	33,620	34,747	35,053	28,992	33,423	33,185	37,112
Wisconsin	300,174	313,044	327,778	337,878	346,145	384,054	316,760	361,650	397,377	384,013
Wyoming						33,981	26,634	29,594	29,805	30,148

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Emergency Department Databases (SEDD), and State Inpatient Databases (SID), 2019-2018 and the Census Bureau.

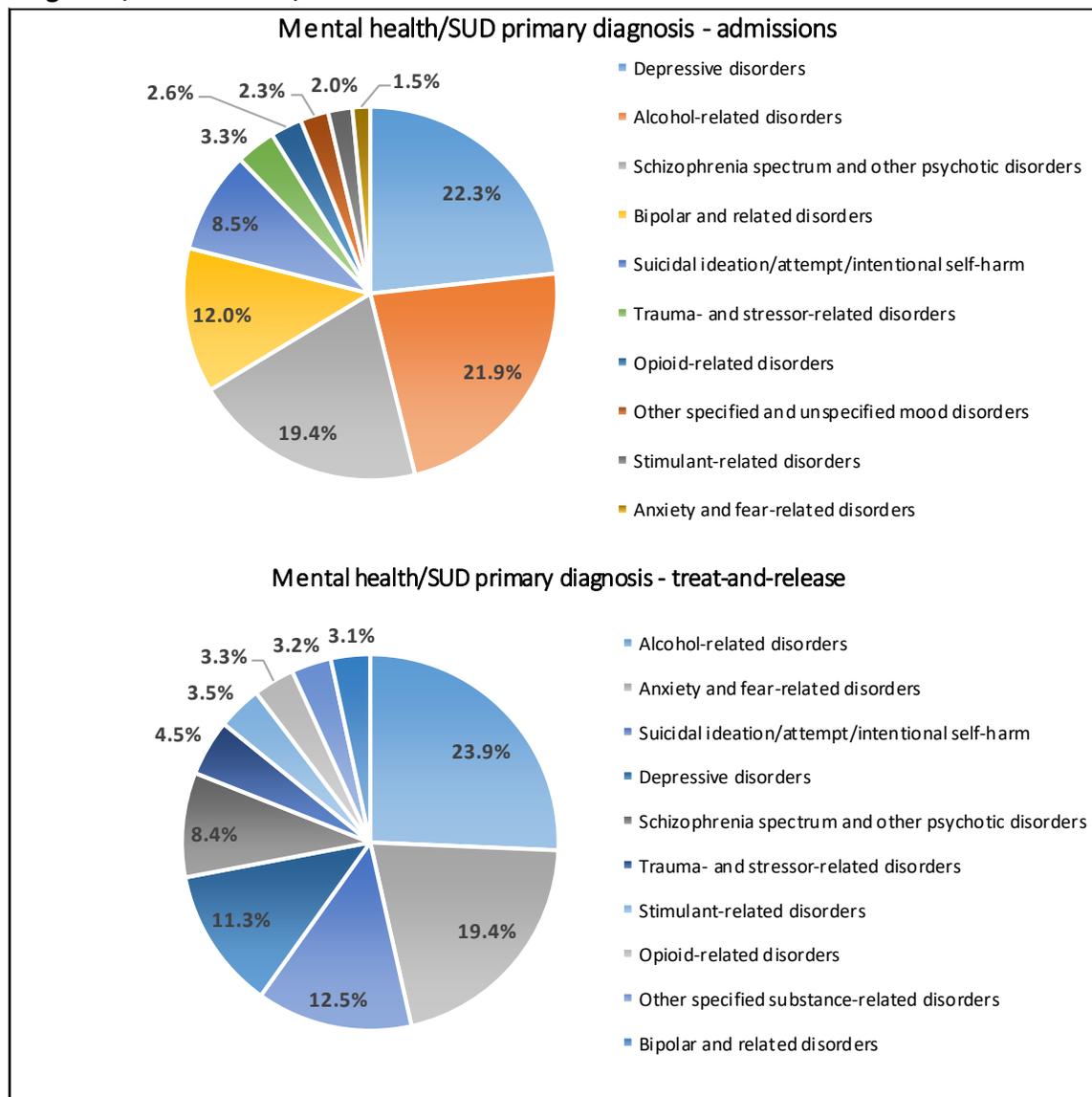
^a Due to the ICD transition, for 2015 data is reported only for quarters 1 through 3. For a more detailed explanation, see *Data sources* section in Appendix (above).

Figure A3: ED visits per 100,000 persons by type for each component of the community social vulnerability index, United States, 2018



Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), Nationwide Emergency Department Sample (NEDS), State Emergency Department Databases (SEDD), and State Inpatient Databases (SID), 2019-2018 and CDC Social Vulnerability Index.

Figure A4: Most common diagnoses for ED visits with mental health/SUD as a primary diagnosis, United States, 2018



Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), Nationwide Emergency Department Sample (NEDS), State Emergency Department Databases (SEDD), and State Inpatient Databases (SID), 2019-2018.

Sample of Recent Reports on ED Utilization from HHS

Agency for Healthcare Research and Quality - HCUP

Costs of Emergency Department Visits in the United States, 2017 ([PDF](#))

Costs of Emergency Department Visits for Mental and Substance Use Disorders in the United States, 2017 ([PDF](#))

Social Determinants of Health and County Population Rates of Opioid-Related Inpatient Stays and Emergency Department Visits, 2016 ([PDF](#))

Trends in Hospital Emergency Department Visits by Age and Payer, 2006-2015 ([PDF](#))

Trends in Emergency Department Visits, 2006-2014 ([PDF](#))

Patient Residence Characteristics of Opioid-Related Inpatient Stays and Emergency Department Visits Nationally and by State, 2014 ([PDF](#))

Patient Characteristics of Opioid-Related Inpatient Stays and Emergency Department Visits Nationally and by State, 2014 ([PDF](#))

Characteristics of Emergency Department Visits for Super-Utilizers by Payer, 2014 ([PDF](#))

Trends in Emergency Department Visits Involving Mental and Substance Use Disorders, 2006-2013 ([PDF](#))

Emergency Department Visits in Rural and Non-Rural Community Hospitals, 2008 ([PDF](#))

Agency for Healthcare Research and Quality – Medical Expenditures Panel Survey

Expenses for a Hospital Emergency Room Visit, 2003 ([PDF](#))

Centers for Disease Control and Prevention

Health Care in America: Trends in Utilization ([PDF](#))

Emergency Department Visits among Adults Aged 60 and Over: United States, 2014-2017 ([PDF](#))

Impact of the COVID-19 Pandemic on Emergency Department Visits – United States, January 1, 2019-May 30, 2019 ([PDF](#))

Vital Signs: Trends in Emergency Department Visits for Suspected Opioid Overdoses – United States, July 2016-September 2017 ([PDF](#))

Mental Health-Related Emergency Department Visits Among Children Aged <18 Years During the COVID-19 Pandemic – United States, January 1-October 17, 2020 ([PDF](#))

Potential Indirect Effects of the COVID-19 Pandemic on Use of Emergency Departments for Acute Life-Threatening Conditions – United States, January-May 2020 ([PDF](#))

Nonfatal Drug and Polydrug Overdoses Treated in Emergency Departments – 29 States, 2018-2019 ([PDF](#))

QuickStats: Emergency Department Visit Rates Related to Mental Health Disorders, by Age Group and Sex – National Hospital Ambulatory Medical Care Survey, United States, 2016-2018 ([PDF](#))

QuickStats: Number of Emergency Department Visits, for Substance Abuse or Dependence per 10,000 Persons Aged ≥ 18 Years, by Age Group – United States, 2008-2009 and 2016-2017 ([PDF](#))

QuickStats: Percentage of all Emergency Department (ED) Visits Made by Patients with Diagnosed Depression, by Sex and Age Group – National Hospital Ambulatory Medical Care Survey, United States, 2016 ([PDF](#))

QuickStats: Percentage of Adults Aged 18-64 Years with Two or More Visits to the Emergency Department in the Past 12 Months, by Health Insurance Coverage Status, and Race/Ethnicity – National Health Interview Survey, 2014 ([PDF](#))

Emergency Department Use in the Country's Five Most Populous States and the Total United States, 2012 ([PDF](#))

Expected Source of Payment at Emergency Department Visits for Adults Aged 18-64 for the United States and in the Five Most Populous States, 2012 ([PDF](#))

Health, United States, 2018 ([PDF](#))

References

Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), Nationwide Emergency Department Sample (NEDS), State Emergency Department Databases (SEDD), and State Inpatient Databases (SID), 2019-2018.

Allen L, Cummings JR, Hockenberry J (2019). Urgent care centers and the demand for non-emergent emergency department visits. National Bureau of Economic Research Working Paper 25428.

Allen H, Gordon SH, Lee D, Bhanja A, Sommers BD (2021). Comparison of utilization, costs, and quality of Medicaid vs subsidized private health insurance for low-income adults. *JAMA Network Open*. 4(1): e2032669.

1999-2018 American Hospital Association Annual Survey (2019) by Health Forum, LLC. Available at <http://www.ahaonlinestore.com>.

Ashman JJ, Schappert SM, Santo L. Emergency department visits among adults aged 60 and over: United States, 2014-2017. Hyattsville, MD: National Center for Health Statistics. 2003.

Bentley TGK, Effros RM, Palar K, Keeler EB (2008). Waste in the U.S. health care system: A conceptual framework. *The Milbank Quarterly*. Dec; 86(4):629-659.

Bernstein AB, Hing E, Moss AJ, Allen KF, Siller AB, Tiggle RB (2003). Health care in America: Trends in utilization. National Center for Health Statistics. Hyattsville, MD.

Billings J, Parikh N, Mijanovich T (2000). Emergency department use in New York City: a substitute for primary care? *Issue Brief*. The Commonwealth Fund. November 2000.

Black LI, Zablotsky B (2020). Urgent care center and retail health clinic utilization among children: United States, 2019. NCHS Data Brief No. 393. National Center for Health Statistics. Hyattsville, MD.

Coster JE, Turner JK, Bradbury D, Cantrell A (2017). Why do people choose emergency and urgent care services? A rapid review utilizing a systematic literature search and narrative synthesis. *Academic Emergency Medicine*. 24:1137-1149.

Denham AC, Hay SS, Steiner BD, Newton WP (2013). Academic health centers and community health centers partnering to build a system of care for vulnerable patients: lessons from Carolina Health Net. *Academic Medicine*. May 2013;88(5):638-643.

Galarraga JE, Pines JM (2016). Cost of ED episodes of care in the United States. *American Journal of Emergency Medicine*. Mar;34(3):357-365.

Garfield R, Young K (2015). How does gaining coverage affect people's lives? Access, utilization, and financial security among newly insured adults. (Washington, DC: Kaiser Family Foundation), June 19,

2015. <https://www.kff.org/health-reform/issue-brief/how-does-gaining-coverage-affect-peoples-lives-access-utilization-and-financial-security-among-newly-insured-adults/view/print/>.

Hartnett KP, Kite-Powell A, DeVies J, Coletta MA, Boehmer TK, Adjemian J, et al. (2020). Impact of the COVID-19 pandemic on emergency department visits – United States, January 1, 2019–May 30, 2020. *Morbidity and Mortality Weekly Report*. June 12, 2020 69(23):699-704.

Health Care Cost Institute (2018). ER spending among the commercially insured continued to rise in 2016, driven by the price and use of high severity cases (2009-2016). Accessed Dec. 30, 2020. <https://healthcostinstitute.org/emergency-room/er-spending-among-the-commercially-insured-continued-to-rise-in-2016-driven-by-the-price-and-use-of-high-severity-cases-2009-2016?highlight=WyJlbWVvY2ZVuY3kiLCJyb29tIiwizW1lcmdlbmN5IHJvb20iXQ==>.

Honigman LS, Wiler JL, Rooks S, Ginde AA (2013). National study of non-urgent emergency department visits and associated resource utilization. *Western Journal of Emergency Medicine*. November 2013, XIV(6):609-616.

Hsia RY, Niedzwiecki M (2017). Avoidable emergency department visits: a starting point. *International Journal for Quality in Health Care* 29(5): 642-645.

Karaca Z, Moore BJ (2020). Costs of emergency department visits for mental and substance use disorders in the United States, 2017. *HCUP Statistical Brief #257*. March 2018. Agency for Healthcare Research and Quality. Rockville, MD.

Lange SJ, Ritchey MD, Goodman AB, Dias T, Twentyman E, Fuld J, et al. (2020). Potential indirect effects of the COVID-19 pandemic on use of emergency departments for acute life-threatening conditions – United States, January–May 2020. *Morbidity and Mortality Weekly Report*. June 26, 2020 69(25):795-800.

Le ST, Hsia RY (2016). Community characteristics associated with where urgent care centers are located: a cross-sectional analysis. *BMJ Open*. 6:e010663.

McConville S, Raven MC, Sabbagh SH, Hsia RY (2018). Frequent emergency department users: A statewide comparison before and after Affordable Care Act Implementation. *Health Affairs* 37(6):881-889.

Medicaid and CHIP Payment and Access Commission. Medicaid enrollment changes following the ACA. Accessed Dec. 28, 2020. <https://www.macpac.gov/subtopic/medicaid-enrollment-changes-following-the-aca/>.

Moore BJ, Stocks C, and Owens PL (2017). Trends in emergency department visits, 2006-2014. *HCUP Statistical Brief #227*. September 2017. Agency for Healthcare Research and Quality. Rockville, MD.

Morley C, Unwin M, Peterson GM, Stankovich J, Kinsman L (2018). Emergency department crowding: A systematic review of causes, consequences and solutions. *PLoS ONE* 13(8): e0203316.

Moulin A, Evans EJ, Zing G, Melnikow J (2018). Substance use, homelessness, mental illness and Medicaid coverage: A set-up for high emergency department utilization. *The Western Journal of Emergency Medicine*. November 2018;19(6):902-906.

Myong C, Hull P, Price M, Hsu J, Newhouse JP, Fung F (2020). The impact of funding for federally qualified health centers on utilization and emergency department visits in Massachusetts. *PLoS One*. Dec 3;15(12):e0243279.

National Association of Community Health Centers (2020). Community Health Center Chartbook. Accessed January 4, 2021. <http://www.nachc.org/wp-content/uploads/2020/01/Chartbook-2020-Final.pdf>.

National Center for Health Statistics (2019). Health, United States, 2018. Hyattsville, MD.

Nikpay S, Freedman S, Levy H, Buchmueller T (2017). Effect of the Affordable Care Act Medicaid expansion on emergency department visits: Evidence from state-level emergency department databases. *Annals of Emergency Medicine* 2017 Aug;70(2):215-225.

Pines JM, Zocchi M, Moghtader A, Black B, Farmer SA, Hufstetler G, et al. (2016). Medicaid expansion in 2014 did not increase emergency department use but did change payer mix. *Health Affairs* 2016 Aug 1;35(8):1480-1486.

Poon SJ, Schuur JD, Mehrotra A (2018). Trends in visits to acute care venues for treatment of low-acuity conditions in the United States from 2008-2015. *JAMA Internal Medicine*. Oct 1;178(10):1342-1349.

Raven MC, Kushel M, Ko MJ, Penko J, Bindman AB (2016). The effectiveness of emergency department visit reduction programs: A systematic review. *Annals of Emergency Medicine*. October 2016; 68(4):467-483.

Rust G, Baltrus P, Ye J, Daniels E, Quarshie A, Boumbulian P, et al. (2008). Presence of a community health center and uninsured emergency department visit rates in rural counties. *The Journal of Rural Health*. December 23 2008;25(1).

Sommers BD, Simon K (2017). Health insurance and emergency department use – a complex relationship. *New England Journal of Medicine*. May 4;376(18):1708-1711.

Sun BC, Hsai RY, Weiss RE, Zingmond D, Liang L, Han W, et al. (2013). Effect of emergency department crowding on outcomes of admitted patients. *Annals of Emergency Medicine* June; 61(6):605-611.

Sun R, Karaca Z, and Wong HS (2018). Trends in hospital emergency department visits by age and payer, 2006-2015. *HCUP Statistical Brief#238*. March 2018. Agency for Healthcare Research and Quality. Rockville, MD.

Usher-Pines L, Pines J, Kellermann A, Gillen E, Mehrotra A (2013). Deciding to visit the emergency department for non-urgent conditions: A systematic review of the literature. *American Journal of Managed Care*. January; 19(1):47-59.

Van den Heede K, Van de Voorde Carine (2016). Interventions to reduce emergency department utilization: A review of reviews. *Health Policy*. December 2016; 120(12): 1337-1349.

Weinick RM, Burns RM, Mehrotra A (2010). How many emergency department visits could be managed at urgent care centers and retail clinics? *Health Affairs (Millwood)* 29(9):1630-1636.

Weiss AJ, Wier LM, Stocks C, Blanchard J (2014). Overview of Emergency Department Visits in the United States. *HCUP Statistical Brief#174*. June 2014. Agency for Healthcare Research and Quality. Rockville, MD.

Zhou RA, Baicker K, Taubman S, Finkelstein AN (2017). The uninsured do not use the emergency department more – they use other care less. *Health Affairs (Millwood)*. December; 36(2):2115-2122.