Hospital Provision of 24-hour Care and Specialized Services

Final Report

Prepared for:

Coalition to Strengthen America's Healthcare

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October 25, 2024

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Executive Summary

Hospitals serve a unique role in the healthcare delivery system, by providing access to specialized and around-the-clock care not otherwise available. The lack of availability of these services outside of the hospital setting is a result of various factors, including cost, staffing, and regulatory barriers. Consequently, hospitals are essential for meeting the healthcare needs of the rural and urban populations they serve. In this report, we document the availability of specialized hospital services and use of emergency departments (EDs) during periods when other providers are not typically available (e.g., after normal business hours).

Provision of Specialized Hospital Services: Although not a complete list of the specialized services provided by hospitals, this study examined care provided in EDs, trauma centers, and psychiatric hospital units as examples of services that are frequently only offered through hospitals in a community.

- Emergency Departments. Through their emergency departments (EDs), hospitals provide emergency services to patients who arrive with a medical condition where the absence of immediate medical treatment could reasonably be expected to put patients' health in jeopardy. EDs provide critical—and sometimes life-saving—services and are accessible to patients 24 hours a day, 7 days a week. Based on 2022 AHA Annual Survey data, eighty percent (80%) of all US hospitals had an on-campus ED, with a quarter of these hospitals located in rural areas. Many hospitals maintain specialized EDs with a focus on pediatrics (24% of hospitals) or psychiatric care (21%).

- Trauma Centers. Trauma centers are equipped to provide critical care to patients with traumatic and life-threatening injuries due to, for example, falls, motor vehicle collisions, and gunshots. At these centers, patients receive care from a multi-disciplinary team of medical professionals, including trauma surgeons and emergency medicine physicians. According to 2022 AHA Annual Survey data, 45% of hospitals had a trauma center, with approximately 600 hospitals (16%) with the highest designation (Level I or II trauma center).

- Psychiatric Units. Psychiatric units within hospitals provide specialized inpatient treatment to individuals who have emotional and behavioral issues that put them at risk of harm to themselves or others. These units provide a highly structured level of care that is designed to address specific needs and conditions for patients with acute psychiatric inpatient hospitalization, including those with severe psychosis and depression. About one quarter, or 941, of hospitals had psychiatric beds, with an average of 35 beds. Some of the nation's hospitals have specialized psychiatric units for children (6% of hospitals) and older adults (11% of hospitals).

Access to ED Treatment and Triaging: EDs are the main destination for patients requiring immediate, unscheduled care. Hospital EDs provide around-the-clock care to all patients, regardless of ability to pay, and triage patients to ensure that they receive the appropriate level of care.

- Hospital EDs are an important care setting for patients without regular access to physician offices. In 2021, 13% of all ED visits occurred in rural areas where access to physician services is hindered by shortages that limit routine and preventative care, resulting in higher unscheduled care. ED services were disproportionately utilized by non-Hispanic Black patients in both urban and rural areas, which could reflect access challenges in the community, such as insufficient access to primary care or increased likelihood to be uninsured or underinsured.
- The majority (61%) of ED visits occur on weekends or after normal business hours. Of the more than 136 million ED visits in 2021, 83.1 million occurred either on weekends or after hours (between 5pm and 8am), when most other providers are closed. A total of 17.6 million ED visits resulted in hospitalization, indicating the acute and serious nature of the patient's condition, of which 55% or 9.8 million occurred on the weekend or after hours.
- There is little overlap between the most common conditions treated in EDs and by urgent care clinics. While the growth of urgent care facilities may offer alternative care settings to hospital EDs, the types of conditions treated at these settings vary, suggesting that urgent care centers are not substitutes for the care provided by EDs. In 2021, overlap between the top conditions treated at urgent care clinics and EDs was limited. Typically, Medicare patients presented to an ED with chest pain, urinary discomfort, dizziness/fainting/weakness, pain in joint and abdomen, as well face and head injuries.[1] In contrast, typical reasons for a visit to urgent care clinics in the same population were related to respiratory tract infections, sore throat, sinusitis, immunizations, and hypertension.

Given the aging population, growth in chronic disease burdens, and advancing technology, patient care in hospitals is likely to become more complex and the patients they serve more severe. As a result, US hospitals will remain an irreplaceable provider of around-the-clock care and specialized services. For many patients, EDs are the main access point to hospitals, and after being admitted through the ED, many patients will go on to receive other specialized services. Providing access to specialized hospital services is costly due to operational and infrastructure needs, equipment, and staffing requirements. In the last few years, hospitals have faced numerous challenges related to increasing costs of medical equipment and supplies, decreasing reimbursement, rising pharmaceutical costs, as well as workforce shortages, with many hospitals facing financial losses.[2] This is particularly true for hospitals serving small and rural communities, where hospitals are closing or eliminating services.[3]

[1] Note, Medicare patients include Americans over the age of 65 and certain disabled Americans under the age of 65.
[2] American Hospital Association. America's Hospitals and Health Systems Continue to face Escalating Operational Costs and Economic Pressures as They Care for Patients and Communities. May 2024. Available at: https://www.aha.org/costsofcaring
[3] Center for Healthcare Quality & Payment Reform. Rural Hospitals at Risk of Closing. July 2024. Available at: https://chqpr.org/downloads/Rural_Hospitals_at_Risk_of_Closing.pdf

To meet the demand for care while maintaining quality and access to care, payments to hospitals from government and private payers must be adequate to ensure continued access to around-the-clock care and specialized services.

Introduction

In 2021, nearly one in ten Americans was hospitalized. The overwhelming majority of hospitalizations (83%) were for medically urgent or life-threatening medical conditions (i.e., non-elective procedures), and nearly 10% of all admissions were injury-related. The demand for hospital services, both inpatient and outpatient, will increase with the aging of the population and growing rates of chronic conditions. By 2050, the size of the Medicare-age population in the US will reach 82 million people or 23% of the total population, while the majority of US adults 50 years and older are projected to have at least one chronic condition.[4,5]

There are currently over 6,000 active hospitals providing care in the US. Hospitals provide a wide range of services to the populations they serve, including specialized services and around-the-clock emergency care. Developing and maintaining these services is costly due to operational and infrastructure needs, equipment, and staffing requirements. In the last few years, hospitals have faced numerous operational challenges related to workforce shortages[6] and increasing operational costs.[7] Many rural hospitals have closed or are at risk of closure.[8]

The healthcare environment continues to evolve as technological advances in the diagnosis and treatment of diseases have shifted care to the ambulatory care setting and new care options have emerged, such as urgent care centers. While non-hospital settings may offer some overlapping services, hospitals still serve a vital role in the healthcare system, providing services that are not available in other care settings in many communities.

In this report, we document the availability of specialized hospital services and use of EDs during periods when other providers are not typically available (e.g., after normal business hours).

- Provision of Specialized Hospital Services: We identify a set of services that are delivered only at a hospital or most likely to be delivered at a hospital.
- 24-Hour ED Use: We examine ED use by type of service, time, and date of admission to identify the set of services that are available/received during hours that other providers are closed or have limited availability (i.e., business week vs. weekends).

[4] Vespa J, Medina L, Armstrong DM. Current Population Reports. Demographic Turning Points for the United States: Population Projections for 2020 to 2060. March 2018, revised February 2020. Available at: https://www.census.gov/content/dam/Census/library/publications/2020/demo/p25-1144.pdf

[5] Ansah JP, Chiu CT. Projecting the chronic disease burden among the adult population in the United States using a multi-state population model. Front Public Health. 2023 Jan 13;10:1082183. doi: 10.3389/fpubh.2022.1082183.

[6] Syntellis Performance Solutions. Hospital Vitals: Financial and Operational Trends: Workforce Pressures Take Their Toll in 2022. February 2023. Available at: https://www.syntellis.com/sites/default/files/2023-03/AHA%20Q2_Feb%202023.pdf

[7] American Hospital Association. America's Hospitals and Health Systems Continue to Face Escalating Operational Costs and Economic Pressures as They Care for Patients and Communities. May 2024. Available at: https://www.aha.org/costsofcaring

[8] American Hospital Association. Rural Hospital Closures threaten Access. September 2022. Available at: https://www.aha.org/system/files/media/file/2022/09/rural-hospital-closures-threaten-access-report.pdf

Where possible, we also report differences between urban and rural areas related to the aspects described above. Generally, access to care is lower in rural areas, particularly for some vulnerable populations (e.g., pregnant people, indigenous people), with longer travel distances to the closest facility and physician shortages, relative to urban areas.[9,10] There is also variation in types of care offered across rural hospitals with small rural hospitals providing services that most urban hospitals and large rural hospitals do not provide (e.g., rehabilitation, long-term care, and primary care).[11] Reduced access to care in rural communities is amplified by the fact that the rural population is, on average, older and in worse health relative to the urban population.

Data Used for Analysis

We use data from national surveys and other sources to examine these dimensions of care. (See Data and Methods, at the end of the report, for more details).

The **National Hospital Ambulatory Medicare Care Survey** (NHAMCS) and the **National (Nationwide) Inpatient Sample** (NIS) provide a comprehensive picture of utilization of inpatient care and emergency services.

Medicare claims data allow us to do targeted analyses related to the utilization of specific services and the utilization of various settings among the Medicare population.

Finally, the **American Hospital Association** (AHA) **Annual Survey** is used to provide a landscape of specialized services available in the hospitals across the US.

Hospital-Offered Specialized Services

In this section, we examine some of the specialized services provided by hospitals. Note, hospitals are often the primary or sole supplier of these services in most communities.

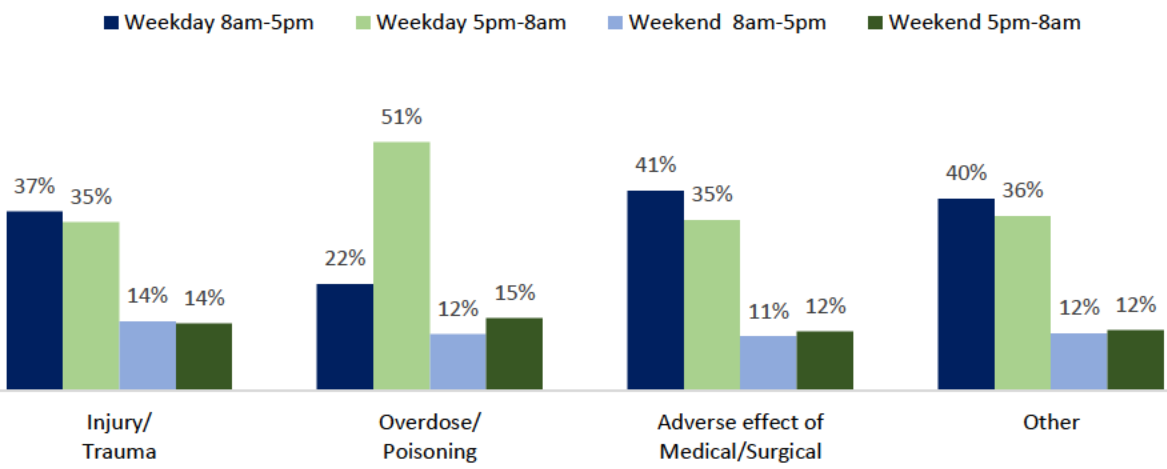
Emergency Departments. EDs specialize in providing treatment to patients who arrive without a prior appointment either by ambulance or by their own means. Particularly for individuals who do not have access to primary or preventative care, EDs provide critical—and sometimes life-saving—services to patients 24 hours a day, 7 days a week. Based on the 3,697 hospitals that completed the 2022 AHA Annual Survey, 80% had an on-campus ED, with a quarter of these hospitals (i.e., 688) located in rural areas. Specialized ED services, such as pediatric and psychiatric ED care, were offered by 24% and 21% of hospitals respectively, with few pediatric EDs and psychiatric EDs located in rural areas.

In 2019, approximately 145 million Americans received care in an ED, which dropped to roughly 136 million in 2021. The reduction in ED total volume was likely a result of the COVID-19 public health emergency (PHE), as the number and patterns of accidents and healthcare use changed during the PHE, with a vast majority of patients relying on provider services outside of hospitals and outpatient centers. In 2024, emergency visits increased by 10% from 2021 levels and approaching pre-PHE levels.[12]

[9] Dobis, E. A., and J. E. Todd. May 2022. Health Care Access Among Self-Employed Workers in Nonmetropolitan Counties, AP-099, U.S. Department of Agriculture, Economic Research Service.
[10] Government Accountability Office. WatchBlog: Following the Federal Dollars. Why Health Care is Harder to Access in Rural America. May 16, 2023. Available at: https://www.gao.gov/blog/why-health-care-harder-access-rural-america
[11] Center for Healthcare Quality and Payment Reform. The Two Different Types of Hospitals in the U.S. Available at: https://ruralhospitals.chqpr.org/downloads/Two_Types_of_Hospitals_in_US.pdf
[12] Kaufmann Hall. National Hospital Flash Report: July 2024 Data. September 4, 2024. Available at: https://www.kaufmanhall.com/insights/research-report/national-hospital-flash-report-july-2024-data

A recent literature review concluded that physical injuries are associated with frequent and repeat use of ED services.[13] EDs often are the first line of care for broken bones, burns, minor lacerations requiring stiches, sprains, as well as patients who arrive by ambulance from the site of injury (e.g., vehicle collisions). Of all ED visits in 2021, 25% (34.3 million) were related to trauma/injury, while 10% were related to overdose or poisoning, or adverse effects of medical treatments. Many ED visits occurred after hours regardless of the day of the week (i.e., after 5pm but before 8am) (Figure 1). Overdose- and poisoning-related ED visits represented 1.5 million ED visits in 2021, two-thirds of which occurred after business hours. We provide additional information on ED visits by day of week and time later in this paper.

Figure 1. ED Visits by Type and Time and Day



Source: KNG Health Analysis of 2021 NHAMCS data.
Note: "Business Hours" is defined as 8am to 5pm, "After Hours" is defined as 5pm to 8am. Other includes reasons for visit not related to injury, trauma, overdose, or poisoning.

Trauma Centers. While all hospital EDs care for a variety of injuries and health emergencies, some hospitals are designated as trauma centers. Patients with serious traumatic and life-threatening injuries from, for example, falls, motor vehicle collisions, and gunshot wounds often receive care at trauma centers. These centers are designed to provide care to critically injured individuals and are equipped with a multi-disciplinary team of medical professionals, including a trauma surgeon, an emergency medicine physician, anesthesiologists, nurses, and others. Relative to EDs, trauma units have the resources and expertise to handle more extreme cases where immediate survival is a concern. Trauma is a leading cause of death among people younger than 46.[14] In addition, trauma-related deaths among elderly have increased in the past decade due to the growing population of elderly individuals, who are more susceptible to injuries, including falls.

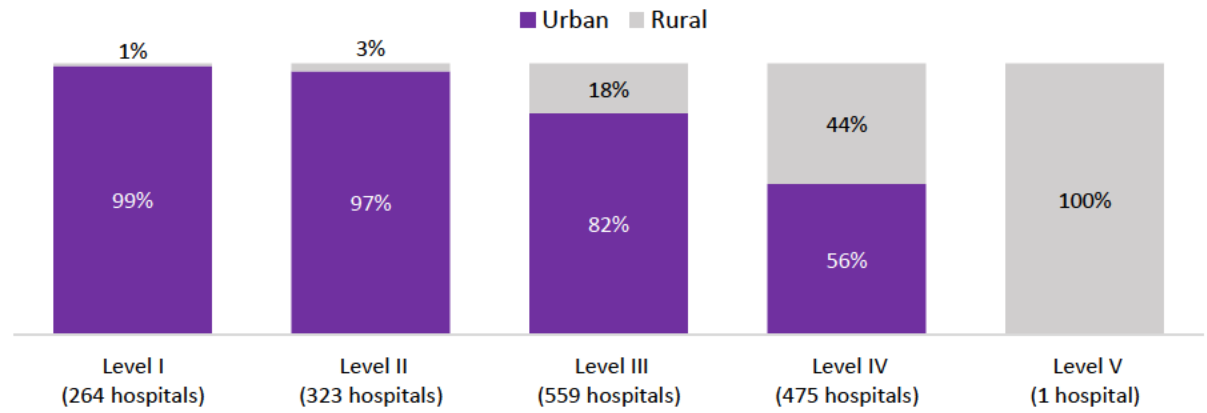
Trauma centers are differentiated by Level (i.e., Level I, II, III, IV, and V) based on the resources available and the number of patients admitted annually. This designation depends on local and state legislation and regulations. Typically, Level I and II trauma centers have cutting-edge equipment and state-of-the-art

[13] Laferté C, Dépelteau A, Hudon C. Injuries and frequent use of emergency department services: a systematic review. *BMJ Open*. 2020 Dec 29;10(12):e040272. doi: 10.1136/bmjopen-2020-040272.
[14] Rhee P, Joseph B, Pandit V. Increasing trauma deaths in the United States. *Ann Surg*. 2014;260:13–21.

technology and are similar in terms of personnel, services, and resource requirements. The main difference is that Level I centers are research and teaching facilities.[15] Level III and IV centers are similar in their ability to provide prompt assessment, resuscitation, intensive care, and stabilization of injured patients,[16] with the only difference being a lack of surgical capabilities in Level IV facilities. Level V trauma centers provide initial evaluation and stabilization and prepare patients for transfer to higher levels of care. A hospital can have multiple trauma center designations (e.g., Level I for adult patients and Level II for pediatric patients).

Almost half of responding hospitals (1,662 or 45%) had a trauma center designation. Figure 2 shows that a vast majority of hospitals with Level I-III trauma centers were in urban areas. Hospitals with the highest level trauma centers (I and II) – those that care for the most complex patients – represented 16% of all hospitals. Cumulatively, hospitals with trauma center levels I-III represented 31% of all hospitals.

Figure 2. Share of Trauma Centers by Urban/Rural Status



Source: KNG Health Analysis of 2022 American Hospital Association Annual Survey.

Trauma centers tend to be located in larger hospitals that serve more densely populated areas. These hospitals also admit patients transferred from hospitals with lower trauma levels and those without trauma centers. Among Medicare-covered patients who received care in a hospital with a trauma center, 64% received care from a hospital's trauma team (as indicated by a trauma response team activation charge on the Medicare claim), indicating the critical nature of the injury. Specifically, nearly 50% of all trauma team activations in 2022 were Level I trauma centers. Trauma team Levels I and II activations accounted for almost 85% of all trauma team activations.

Psychiatric Units. Psychiatric units within hospitals provide specialized inpatient treatment to individuals who have emotional and behavioral issues that put them at risk of harm to themselves or others. These units provide a highly structured level of care that is designed to address specific needs and conditions for patients with acute psychiatric conditions, including those with severe psychosis and depression. About one quarter, or 941, of all hospitals that responded to the AHA annual survey had a psychiatric unit, with

[15] California Emergency Medical Services Authority. EMS Systems Division — Trauma Level Overview. Available at: https://emsa.ca.gov/ems-systems-division-trauma-level-overview/

an average of 35 beds.[17] Rural hospitals with a psychiatric unit had an average of 17 psychiatric beds. Rural hospitals tend to be smaller than urban hospitals, as they serve smaller communities.[18]

Some of the nation's psychiatric units provide specialized care for children and older adults. While the demand for these services is high[19], the supply is constrained by the availability of trained personnel and shortages in physicians who are board-certified in child and adolescent psychiatry, as well as geriatric psychiatrists.[20] As a result, only about 6% of all hospitals provided psychiatric pediatric care with an average capacity of 21 beds (all but 4 of these hospitals were in urban areas). A higher number of hospitals provided psychiatric geriatric care (11% of all hospitals, of which 41 hospitals operated in a rural area).

The access to psychiatric services is limited in rural areas, with disparities in the treatment of mental health conditions between urban and rural areas also evident among older patients. While rural and urban areas have a similar prevalence of serious mental illness among US adults, residents of rural areas receive treatment less frequently than their counterparts residing in urban areas.[21] Studies note that differences in access to outpatient services, along with shortages of mental health professionals in rural areas, could be responsible for higher hospitalization rates for suicide and self-injury in children in rural areas relative to those in metropolitan areas.[22]

Burn Units. About 30,000 burn admissions occur annually, of which extensive burns and deep burns requiring surgical treatment account for slightly more than one-third of admissions. Burn units are specialized hospital units that provide treatment and recovery for patients with burns; these patients often have secondary inflammation, infection, and organ failures. Given the highly specialized nature of burn care, not all hospitals have a burn unit. In the US, 3% of all hospitals have a burn care unit with an average capacity of 12 burn care beds; none of these hospitals are in rural areas. The inability to access facilities equipped to address the needs of patients with burns adds to unique challenges faced by rural communities and contributes to disparities in care (e.g., research showed that while rural patients sustain more extensive burns, they are not hospitalized at a greater rate).[23]

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[17] Most hospitals provide inpatient and emergency services to psychiatric patients, such as patients suffering from depression or psychosis, but approximately one quarter have specialized units to treat inpatient psychiatric patients.

[18] Center for Healthcare Quality and Payment Reform. The Two Different Types of Hospitals in the U.S. Available at: https://ruralhospitals.chqpr.org/downloads/Two_Types_of_Hospitals_in_US.pdf

[19] American Psychological Association. Psychologists Reaching Their Limits as Patients Present with Worsening Symptoms Year After Year. 2023 Practitioner Pulse Survey. Available at: https://www.apa.org/pubs/reports/practitioner/2023-psychologist-reach-limits

[20] American Academy of Child & Adolescent Psychiatry. Severe Shortages of Child and Adolescent Psychiatrists Illustrated in AACAP Workforce Map. May 2022. Available at: https://www.aacap.org/AACAP/zLatest_News/Severe_Shortage_Child_Adolescent_Psychiatrists_Illustrated_AACAP_Workforce_Maps.aspx

[21] Morales DA, Barksdale CL, Beckel-Mitchener AC. A call to action to address rural mental health disparities. J Clin Transl Sci. 2020 May 4;4(5):463-467. doi: 10.1017/cts.2020.42.

[22] Corrie E. McDaniel, Matt Hall, Jessica L. Markham, Jessica L. Bettenhausen, Jay G. Berry; Urban-Rural Hospitalization Rates for Pediatric Mental Health. *Pediatrics* June 2023; 151 (6): e2023061256.

[23] Duggan RP, Brondeel KC, Mahony WL, Torres G, Palackic A, Branski LK. 546 Health Disparities Among Rural Burn Patients. *J Burn Care Res*. 2022 Mar 23;43(Suppl 1):S108. doi: 10.1093/jbcr/irac012.174.

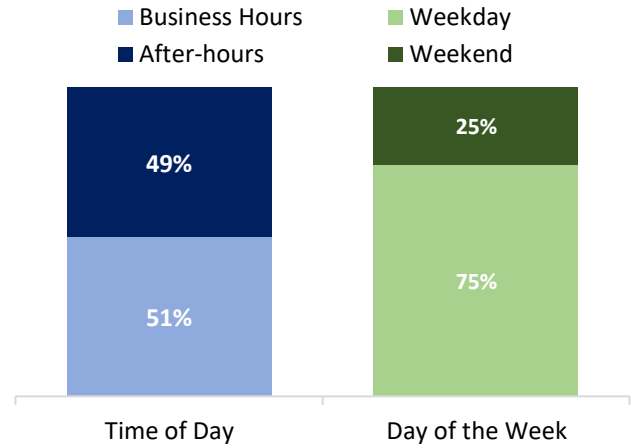
Hospital-based ED Services

EDs are optimized for quick response and short-term care and typically staffed with personnel who have specialized training in emergency medicine (e.g., emergency physicians have a medical degree plus 3 to 4 years of specialty training in emergency medicine).[24] EDs use a priority system in providing care, which is based on patient condition severity. In cases when patients are deemed to be severely ill, they are admitted to the hospital. In this section, we take a deeper look into the types of patients treated in EDs after business hours, the critical nature of conditions presented to the ED, including rates of transfer to inpatient hospital care, and location of ED use (rural vs. urban).

EDs are Highly Used After Typical Business Hours

ED Use by Time and Date of Admission. Nearly half of all ED visits occurred after standard business hours (between 5pm and 8am), and that share remained stable between 2019 and 2021. The majority (65%) of these after-hours visits occurred after 8pm, when even urgent care clinics are likely to be closed. A quarter of all ED visits were on weekends, with a substantial share of all ED visits – 13% or 17.5 million ED visits in 2021 – occurring both after hours and on the weekend (Figure 3). More specifically, 39% of ED visits occur on weekdays during business hours; 12% of ED visits occur on weekends during business hours; 36% of ED visits occur on weekdays after business hours; and 13% of ED visits occur on weekends after business hours. So, 61% of all ED visits occur on weekends and/or after business hours.

Figure 3. Total Utilization by Time and Day of ED Visit

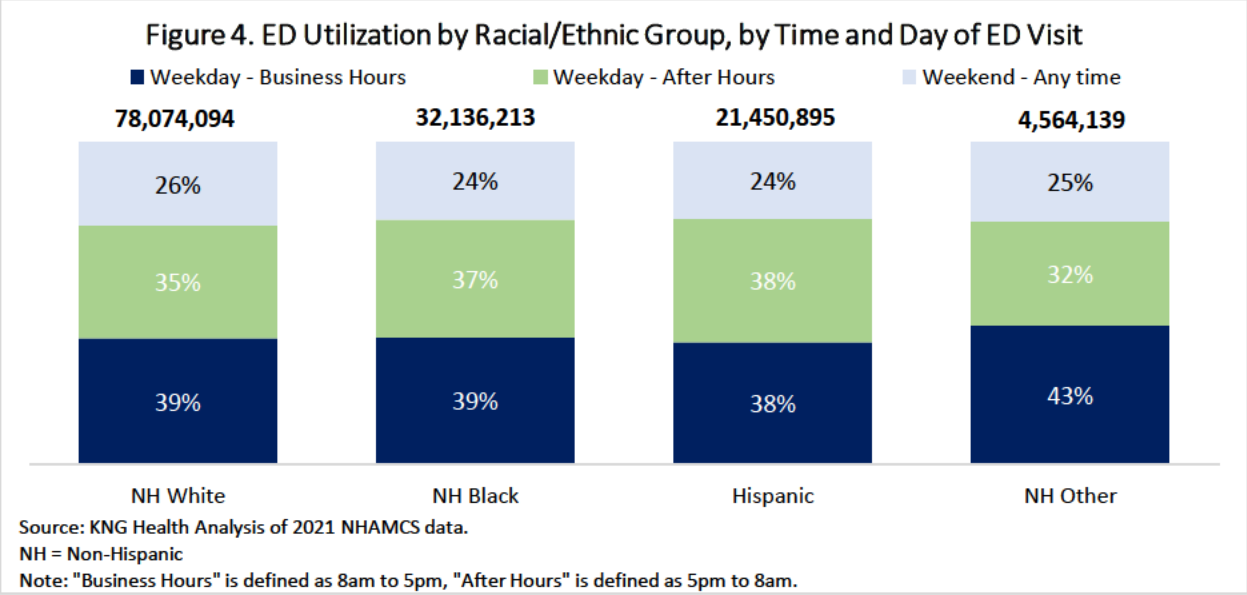


Source: KNG Health Analysis of 2021 NHAMCS data.
Note: "Business Hours" is defined as 8am to 5pm, "After Hours" is defined as 5pm to 8am.

ED Use by Race and Ethnicity, Time/Day of Admission. Issues related to access and medical mistrust have impacted the health utilization trends of different racial and ethnic groups.[25] Specifically, Black Americans utilize ED services at a disproportionate rate. Despite making up 12% of the U.S. population, non-Hispanic Black patients accounted for 24% of ED visits in 2021. That same year, 57% of all ED visits were by non-Hispanic White individuals, 16% were by Hispanic individuals, and 3% were by non-Hispanic Other Race individuals. This could be due, at least in part, to historical challenges many Black Americans face in accessing care, such as limited access to primary care services or increased likelihood to be uninsured or underinsured.[26]

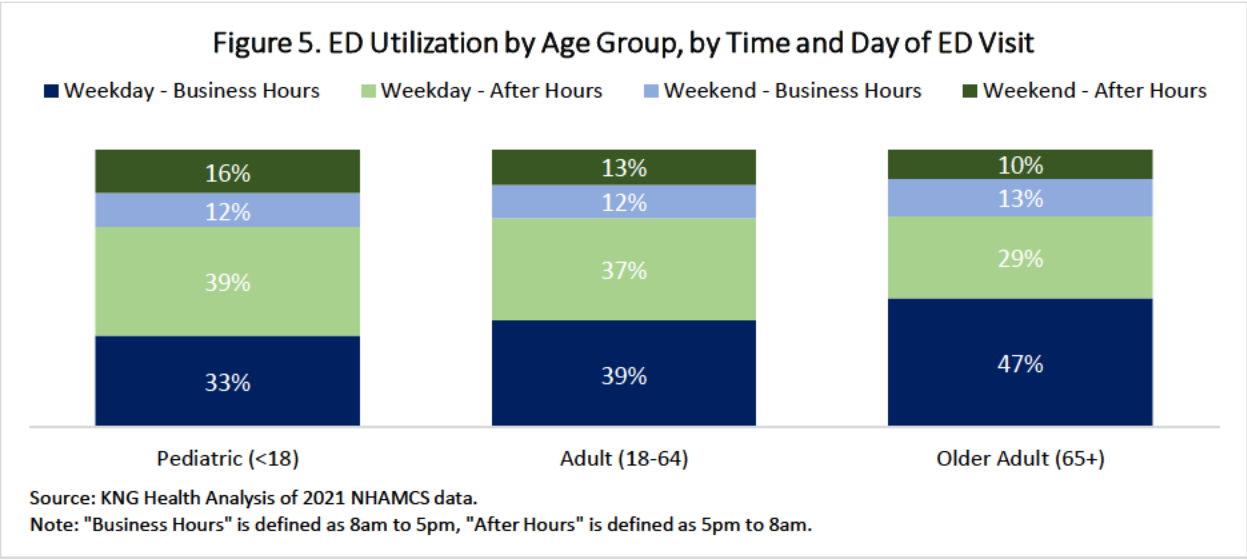
[24] Chekijian SA, Elia TR, Horton JL, Baccari BM, Temin ES. A Review of Interprofessional Variation in Education: Challenges and Considerations in the Growth of Advanced Practice Providers in Emergency Medicine. AEM Educ Train. 2020 Jul 10;5(2):e10469.
[25] Arnett MJ, Thorpe RJ, Gaskin DJ, Bowie JV, LaVeist TA. Race, Medical Mistrust, and Segregation in Primary Care as Usual Source of Care: Findings from the Exploring Health Disparities in Integrated Communities Study. *Journal of Urban Health: Bulletin of the New York Academy of Medicine*, 93(3). doi:10.1007/s11524-016-0054-9.
[26] KFF. How Present-Day Health Disparities for Black People Are Linked to Past Policies and Events. February 22, 2024. Available at: https://www.kff.org/racial-equity-and-health-policy/issue-brief/how-present-day-health-disparities-for-black-people-are-linked-to-past-policies-and-events/

Figure 4 shows total ED visits by racial/ethnic group across both time of day and the day of the week. Results show that utilization trends are relatively similar across non-Hispanic White, non-Hispanic Black, and Hispanic individuals.



Source: KNG Health Analysis of 2021 NHAMCS data.
NH = Non-Hispanic
Note: "Business Hours" is defined as 8am to 5pm, "After Hours" is defined as 5pm to 8am.

ED Use by Age. The use of hospital services varies by age, with older adults requiring more healthcare than their younger counterparts. Additionally, the proportion of those under age 18 has decreased, accounting for 22% in 2021. These trends are driven by the aging of the US population and limited growth in the number of children. The ED visit breakdown by age mimics the US population. Children (under the age of 18) constituted 21% of all ED visits in 2021; 55% or 15.3 million of children's ED visits occurred after standard business hours. The pediatric group had the highest share of ED visits after hours on weekends (16% or 4.4 million all pediatric ED visits). Those 65 years and older accounted for the smallest proportion of ED visits in general, as well as after hours (14% of all ED visits after hours in 2019 and 16% in 2021). Older adults also had the lowest share of after-hours ED visits on weekends – 10% or 2.8 million visits (Figure 5).



Source: KNG Health Analysis of 2021 NHAMCS data.
Note: "Business Hours" is defined as 8am to 5pm, "After Hours" is defined as 5pm to 8am.

EDs: Front-line Care for Life-threatening Conditions and Those Requiring a Hospital Stay

Urgency of Visit. EDs operate based on case priority with the highest priority given to critically ill and those with life-threatening injuries (priority level "immediate" and "emergent"), relative to patients with other injuries and conditions. ED visits designated as life-threatening represented 17% of all ED visits in 2021, with 49% occurring after-hours. Many patients who visit the ED do not have life-threatening injuries but may be unable to readily access care elsewhere. For these patients, EDs serve as a critical safety net.

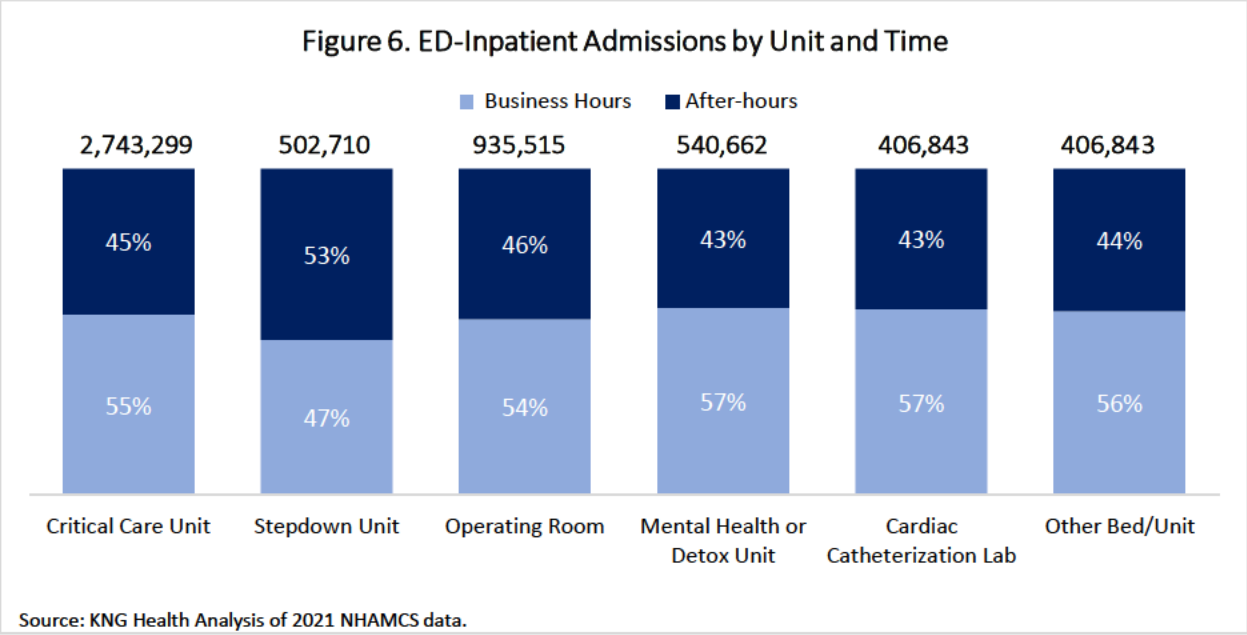
ED Visits and ED-inpatient admissions by Time of Day. In 2019, 11% of all ED visits, or 16.1 million ED visits, resulted in an inpatient stay at the co-located hospital. The number of admissions grew by 1.5 million between 2019 and 2021, yielding 17.6 million ED-inpatient admissions (representing 13% of all ED visits). Among these visits, a larger share was for non-Hispanic Black individuals than in the general population, with 67% for Non-Hispanic White individuals, 20% for non-Hispanic Black individuals, and 9% for Hispanic individuals. Historical disparities in access to care, including but not limited to decreased access to primary care and higher uninsured rates, could be contributing factors. With respect to age, 8% of all ED-inpatient admissions were among pediatric patients, while 48% were among working age adults, with 2.1 million admissions being on the weekends (of which 1.2 million were after-hours). The age breakdown of ED-inpatient admissions toward the older population likely reflects a higher prevalence of chronic and other conditions in that population. With respect to after-hours weekend admissions, the shares were: 11% of all pediatric admissions, 14% of all adult admissions, and 9% of older adult admissions happen on weekends after-hours.

ED Visits Resulting in a Hospitalization by Unit. ED-inpatient admissions reflect the severity of patients' conditions. Specifically, of those admitted to the same hospital as the ED, 16% (or 2.7 million) were admitted to a critical care unit, 5% to the operating room, 3% to a stepdown unit, 3% to a mental health or detox unit, and 2% to a cardiac catheterization lab. The proportion of these admissions that occurred after hours was between 43% and 53%, depending on the unit (Figure 6). Notably, the number of ED visits admitted to critical care units, operating rooms, and mental health units has increased over time, with larger increases for critical care units (not shown). Perhaps this is not surprising, as EDs often serve as the first line of care for critically ill and severely injured patients who arrive by ambulance. The ED's role is to stabilize, provide initial diagnostics and interventions, evaluate, and prepare patients for transfer to a specialized care destination, such as a critical care unit, cardiac catheterization lab, and other units. The increase in the number of critically injured and severely ill may reflect recent trends in motor vehicle crashes[27], gun violence,[28] and the number of people with chronic conditions and multimorbidity.[29]

[27] US Department of Transportation. Summary of Motor Vehicle Crashes: 2021 Data. Available at: https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813515

[28] Panchal N. The Impact of Gun Violence on Children and Adolescents. February 22, 2024. Available at: https://www.kff.org/mental-health/issue-brief/the-impact-of-gun-violence-on-children-and-adolescents/

[29] Ansah JP, Chiu CT. Projecting the chronic disease burden among the adult population in the United States using a multi-state population model. *Front Public Health*. 2023 Jan 13;10:1082183. doi: 10.3389/fpubh.2022.1082183.



Source: KNG Health Analysis of 2021 NHAMCS data.

ED-Inpatient Admission to a Mental Health/Detox Unit or Facility. Individuals may present to the ED with mental health or substance abuse issues requiring immediate attention. Some of these patients may be admitted to mental health and detox units within the hospital. For these ED visits, a disproportionate share occurs at times when other providers are not available.

Patients with mental and behavioral health issues have unique care needs that can be accommodated by a limited number of trained healthcare providers and settings. While some hospitals provide specialized psychiatric emergency services, those might not be sufficient to meet patient needs. Psychiatric hospitals, on the other hand, specialize in providing inpatient treatment of mental health disorders, including severe psychosis and depression. Of all ED visits in 2021 that resulted in either an admission to a co-located hospital or transfer to other hospitals or nursing homes, 5% (or 1.1 million) were transferred to psychiatric hospitals. This finding aligns with recent literature that highlights the increased reliance on ED services to manage patients with mental health conditions, and use of ED services in place of more appropriate medical interventions.[30]

Urban and Rural ED Use Reflects Demographic Differences, Although After Hours Use is Similar

Healthcare accessibility is a major issue in rural communities. In 2021, 18 million or 13% of all ED visits occurred in rural communities. This utilization pattern is driven by population size, with roughly 60 million individuals living in rural areas and more than 274 million living in urban areas.

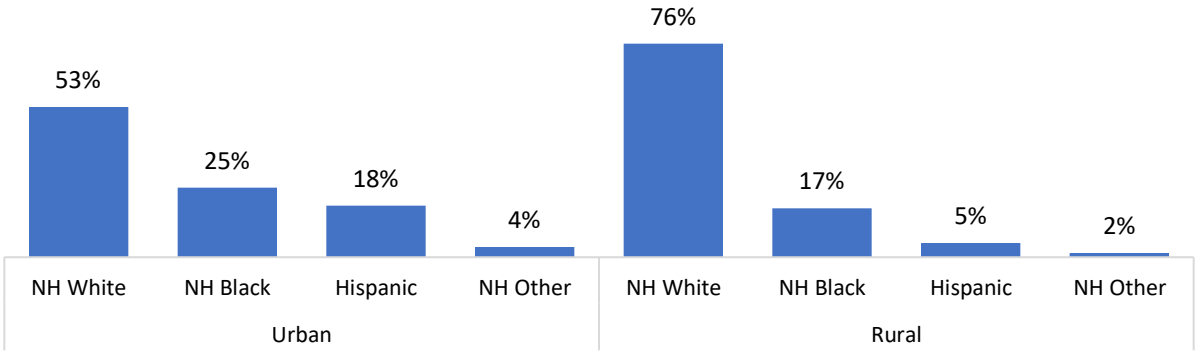
Urban and rural areas have a similar proportion of ED visits occurring on weekends after 5pm (e.g., in 2021, 13% in urban (MSA) areas and 12% in rural areas). As noted earlier, physician shortages combined

[30] Santillanes G, Axeen S, Lam CN, Menchine M. National trends in mental health-related emergency department visits by children and adults, 2009–2015. *The American Journal of Emergency Medicine.* 2020. doi: 10.1016/j.ajem.2019.12.035. Available at: https://www.sciencedirect.com/science/article/abs/pii/S0735675719308423

with the, on average, older population in rural areas result in unscheduled care needs that are on par with the needs in urban areas. There was no meaningful geographic variation in weekend after-hours ED utilization (i.e., ranges from 12% in Northeast and South to 14% in Midwest in 2021).

There are substantial differences in the demographic composition of urban and rural areas with rural areas being predominately non-Hispanic White (i.e., 76% of the rural population according to the 2020 Census).[31] Non-Hispanic Black and minority groups make up a much smaller share of rural population compared with urban areas (i.e., 8% of rural population are Black vs 13% of urban population).[32] In contrast, urban and suburban areas are more racially diverse (e.g., while 9% of the rural population are Hispanic, they represent 20% of urban population).[33] In rural areas, non-Hispanic White individuals accounted for most after-hours ED visits (76%), and non-Hispanic Black and Hispanic individuals accounted for a smaller share of admissions (17% and 5%, respectively). By contrast, in urban areas, non-Hispanic Black patients accounted for roughly a quarter of all after-hours ED visits (Figure 7).

Figure 7. After-Hours ED Utilization by Racial/Ethnic Group, by Urban/Rural Status



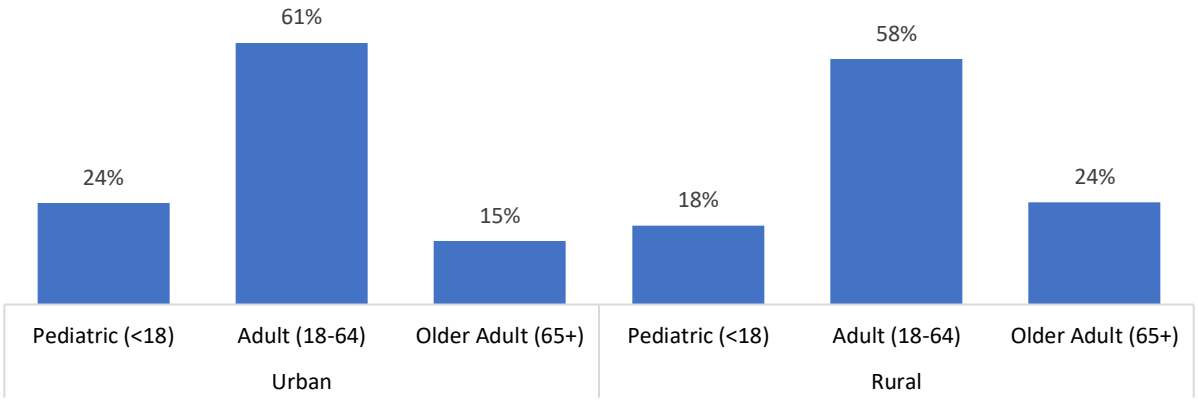
Source: KNG Health Analysis of 2021 NHAMCS data.
Note: "Business Hours" is defined as 8am to 5pm, "After Hours" is defined as 5pm to 8am.

Similar to differences in racial and ethnic composition of population, age distribution also varies across urban and rural areas, with rural areas on average being older than urban areas (i.e., 20% of rural population are over age of 65 relative to 16% in urban areas).[34] In contrast, the pediatric population is disproportionately located in urban areas: roughly one in five children live in rural areas.[35] Across age groups, the pediatric population is more likely to use EDs after business hours in urban areas: 24% of all

[31] University of New Hampshire. Growing Racial Diversity in Rural America: Results from the 2020 Census. May 25, 2022. Available at: https://carsey.unh.edu/publication/growing-racial-diversity-rural-america-results-2020-census
[32] USDA. Rural America at a Glance: 2018 Edition. November 2018. Available at: https://www.ers.usda.gov/webdocs/publications/90556/eib-200.pdf?v=2803.5
[33] Pew Research. Demographic and economic trends in urban, suburban and rural communities. May 22, 2018. Available at: https://www.pewresearch.org/social-trends/2018/05/22/demographic-and-economic-trends-in-urban-suburban-and-rural-communities/
[34] Davis JC, Rupasingha A, Cromartie J, Sanders A. Rural America at a glance. 2022 Edition. November 2022. https://www.ers.usda.gov/webdocs/publications/105155/eib-246.pdf?v=4569.3
[35] U.S. Department of Health and Human Services Health Resources and Services Administration. The Health and Well-Being of Children in Rural Areas: A Portrait of the Nation 2011-2012. April 2015. Available at: https://mchb.hrsa.gov/sites/default/files/mchb/data-research/nsch-health-well-child-rural-04-2015.pdf

after-hours pediatric ED visits took place in MSAs relative to 18% of all after-hours pediatric ED visits in rural areas (Figure 8).

Figure 8. After-Hours ED Utilization by Age Group, by Urban/Rural Status



Source: KNG Health Analysis of 2021 NHAMCS data.
Note: "Business Hours" is defined as 8am to 5pm, "After Hours" is defined as 5pm to 8am.

Common Conditions Treated in EDs Differed from Urgent Care Centers among Medicare Patients

In addition to EDs, a limited number of healthcare providers deliver care outside of normal business hours. For example, urgent care clinics stay open longer on weekdays than any other healthcare provider and are open during the day on weekends, when other providers are closed. While both settings provide care outside of typical business hours, urgent care clinics may not be a reasonable substitute for ED care. **Apart from urinary discomfort and symptoms of and cases of COVID-19, there are major differences between the primary diagnoses recorded during ED visits and those recorded during urgent care visits.** Specifically, an analysis of 2021 Medicare claims and NHAMCS data shows that the top ten primary ICD-10 diagnoses for ED visits are related to chest pain, urinary discomfort, dizziness/fainting/weakness, pain in joint and abdomen, as well face and head injuries. These diagnoses represent 41% of all ED visits (excluding COVID-19 diagnosis). In contrast, the Medicare population sought care at urgent care clinics for respiratory tract infections, sore throat, sinusitis, immunizations, and hypertension. These diagnoses accounted for 22% of all urgent clinic primary diagnoses. Additionally, urgent care clinics had a much larger proportion of visits with diagnoses related to COVID-19 (32% of all recorded primary diagnoses compared to 7% of ED visit primary diagnoses). (Tables 1-2)

Table 1: Top Ten Primary Diagnoses of ED Visits in Medicare Population, 2021

Code	Description	Count	Percent
R079	Chest pain	800,133	6.4%
R060	Shortness of breath [36]	686,665	5.5%
N390	Urinary tract infection	549,362	4.4%
R55	Fainting or passing out [37]	498,827	4.0%
R42	Dizziness	495,962	4.0%
R109	Unspecified abdominal pain	457,458	3.7%
M255	Pain in joint	422,836	3.4%
N179	Acute kidney failure, unspecified	413,357	3.3%
R531	Weakness	401,941	3.2%
S099	Unspecified injury of face and head	385,071	3.1%
Total		**12,442,818**	**41.1%**

Source: KNG Health analysis. Data: 2021 National Hospital Ambulatory Medical Care Survey limited to Medicare population. Total reflects total visits across all diagnoses and not the top ten.

Table 2: Top Ten Primary Diagnoses of Urgent Care Clinic Claims in Medicare Population, 2021

Code	Description	Count	Percent
Z23	Immunization	16,950	6.4%
N390	Urinary tract infection	6,904	5.5%
Z03818	Possible exposure to COVID-19	4,996	4.4%
J069	Acute upper respiratory infection	4,655	4.0%
R300	Pain or discomfort when urinating [38]	3,639	4.0%
R05	Cough	3,527	3.7%
Z01818	Preprocedural examination	3,168	3.4%
J0190	Acute sinusitis	3,002	3.3%
J029	Acute sore throat [39]	2,607	3.2%
I10	Hypertension	2,192	3.1%
Total		**280,136**	**21.9%**

Source: KNG Health analysis. Data: 2021 5% Medicare Carrier fee-for-service claims. Total reflects total visits across all diagnoses and not the top ten.

Finally, of 313,611 urgent care visits in 2022 among Medicare beneficiaries, 6% were followed by an ED visit within the two days of the urgent care visit, potentially indicating a suboptimal choice of the provider. There was a slight difference in the share of follow-up visits to EDs based on the day of the week of the urgent care visits. Specifically, 6.5% of visits to urgent care clinics on weekends were followed by at least one ED visit within 2 days, while about 5.8% of visits on the weekday were followed by an ED visit within 2 days of urgent care clinic visit. In 2019, the differential was larger: 8.4% vs 7.6% but grew to a 1.3-percentage-point difference in 2020. These differentials in follow-up ED visits observed between weekday and weekend utilization of urgent care clinics might indicate that patients underestimate the severity of their illness and seek care in settings alternative to EDs. While reasons could be related to the costs of care (with urgent care clinic being a cheaper option), or anticipated wait time (with ED potentially being

[36] Also known as Dyspnea.
[37] Also known as Syncope.
[38] Also known as Dysuria.
[39] Also known as Pharyngitis.

longer due to severity priority system), we have not evaluated these or other underlying reasons in this report.

Discussion and Conclusions

As the incidence of chronic conditions and average age of the population increase, inpatient volume is projected to increase over the next decade.[40] In these coming years, US hospitals will remain an irreplaceable provider of around-the-clock care and specialized services. Forecasters expect patient care to become more complex, and the need for specialized service capacity to grow in future.[42] Our findings provide a comprehensive picture of the utilization of inpatient care and emergency services and reveal that a bulk of specialized capacities, such as the availability of psychiatric units, geriatric and pediatric EDs, and trauma centers, are in urban areas. Additionally, constrained resources and shortages of healthcare professionals, including mental health professionals, contribute to disparities in access and treatment in both young and elderly.

In addition to traditional hospital care, ED volume is also expected to increase between 2024 and 2034, with the most recent reports citing a 4-percent increase in ED visits per day between 2023 and 2024.[41] With ED volume's return to pre-COVID levels, we expect that much of this volume is driven by after-hours and weekend care. In our analyses, nearly double the number of ED visits occur on weekends or after-hours.

Additionally, new care settings like urgent care facilities are not equipped to replace the care offered at EDs. Overlap between urgent care clinics and EDs is limited to urinary discomfort and symptoms and cases of COVID-19. Further, in situations where there is overlap, patients with more serious conditions are more likely to seek treatment at hospital EDs rather than urgent care settings, resulting in increased acuity in that setting. Typically, Medicare-age people presented to ED with chest pain, urinary discomfort, dizziness/fainting/weakness, pain in joint and abdomen, as well face and head injuries. In contrast, typical reasons for a visit to urgent care clinics in the same population were related to respiratory tract infections, sore throat, sinusitis, immunizations, and hypertension. Notably, 6% of urgent care visits resulted in a visit to an ED within the two days following the urgent care visit, indicating potentially a suboptimal choice of provider.

Specialized services and constant availability of acute-level care make hospitals, and emergency departments, an integral part of the healthcare system. EDs are often an access point to the hospital for patients, and after being admitted through the ED, many patients will go on to receive other specialized services. However, providing access to hospital-level care is costly due to operational and infrastructure needs, equipment, and staffing requirements. In the last few years, hospitals have faced numerous challenges related to increasing cost of medical equipment and supplies, decreasing reimbursement, rising pharmaceutical costs, as well as workforce shortages, with many hospitals facing financial losses.[42]

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[40] Vizient. 2024 Impact of Change® Forecast Highlights. 2024. Available at: https://vizientinc-delivery.sitecorecontenthub.cloud/api/public/content/47212a11b76244d2b3bc7f0e0db086e5

[41] Kaufmann Hall. National Hospital Flash Report. April 2024. Available at: https://www.kaufmanhall.com/sites/default/files/2024-05/KH-NHFR-2024-06.pdf

[42] American Hospital Association. America's Hospitals and Health Systems Continue to face Escalating Operational Costs and Economic Pressures as They Care for Patients and Communities. May 2024. Available at: https://www.aha.org/costsofcaring

This is particularly true for hospitals serving small and rural communities, where hospitals are closing or eliminating services.[43] To meet the demand for care, while maintaining quality, payments to hospitals from government and private payers must be adequate to ensure continued access to around-the-clock care and specialized services.

[43] Center for Healthcare Quality & Payment Reform. Rural Hospitals at Risk of Closing. July 2024. Available at: https://chqpr.org/downloads/Rural_Hospitals_at_Risk_of_Closing.pdf

Appendix: Data and Methods

We conduct descriptive analyses relying on multiple data sources, including:

- 2019 & 2021 National Hospital Ambulatory Medical Care Survey (NHAMCS);
- 2019 & 2021 National (Nationwide) Inpatient Sample (NIS);
- 2019, 2021, & 2022 Medicare Fee-For-Service (FFS) Claims; and
- 2022 American Hospital Association Annual Survey.

National Hospital Ambulatory Medical Care Survey. The NHAMCS is a nationally representative survey designed to collect data on the utilization and provision of ambulatory care services. The NHAMCS ED public-use micro data file includes a sample of visits to EDs from 500 nationally representative hospitals. Hospitals eligible to participate in NHAMCS include those that are non-Federal general and short-stay hospitals, located in the 50 states or the District of Columbia, and have a 24-hour ED. We identify the date and time of ED visits by timestamp, and categorize ED visits by business hours (i.e., 8am to 5pm), after hours (i.e., 5pm to 8am), and weekday (Monday through Friday) versus weekend. For sensitivity, we also considered a broader definition of business hours being 8am to 6pm. We use patient visit weights provided in the data to obtain the national level of ED estimates. We note that ED arrival time is missing for 4.1% of the ED visits in 2019 and 2.5% in 2021. Since we cannot identify whether those visits happened during normal business hours or after business hours, we exclude them from our analysis.

National (Nationwide) Inpatient Sample. The NIS is the largest publicly available all-payer database of inpatient stays. The 2021 NIS sampling frame includes data from 48 statewide data organizations (47 States plus the District of Columbia), covering 97 percent of the U.S. population and including 96 percent of discharges from U.S. community hospitals.[44] Like the analysis of ED utilization after business hours, we used patient visit weights to obtain the national level estimates of admissions.

Medicare Fee-For-Service Claims. We supplement our analyses with Medicare fee-for-service claims. Specifically, we used the 5% Carrier and Inpatient standard analytic files (SAFs) to identify specific services or groups of services that may only or primarily be provided by hospitals; and the 5% Outpatient SAF to examine the substitutability between ED visits and visits to urgent care clinics. Using these data files, we identify several populations of interest:

Population	Description
Significant Mental and Behavioral Health Issues	Beneficiaries who had a hospitalization for mental or behavioral health issues. We measure mental or behavioral health by presence of diagnosis codes for depression, bipolar, or other depressive mood disorders, ADHD, conduct disorders, and hyperkinetic syndrome, alcohol use and drug use disorders, anxiety disorders, autism spectrum disorders, post-traumatic stress disorders, personality disorders, schizophrenia, and other psychotic disorders.
COVID-19 Diagnosis	Beneficiaries with an admission date between April 1, 2020, and December 31, 2022, and had a primary or secondary COVID-19 diagnosis (ICD-10 code U07.1).

[44] HCUP Central Distributor. NIS Data and Documentation. Available at: https://hcup-us.ahrq.gov/db/nation/nis/NIS_Introduction_2021.jsp#understanding-the-nis

Care at Urgent Care Clinics	Beneficiaries with urgent care clinic visits occurring between January 1 and December 29 to allow for a two-day window to identify use of ED subsequent to urgent care clinic visit.
Patients Treated by a Trauma Team	For 2022, trauma team activations were determined by trauma activation charges on a claim. Specifically, if a claim had a revenue code corresponding to trauma certification level (068X) and HCPCS for trauma activation (G0390) on outpatient claims or claim admission type corresponding to visits in a trauma center/hospital as licensed or designated by the state or local government authority authorized to do so, or as verified by the American College of Surgeons for inpatient claims.

American Hospital Association Annual Survey. To evaluate a unique feature of hospitals like standby capacity, we used the 2022 American Hospital Association Annual Survey to provide information on the presence of unique services such as pediatric ED and trauma centers at the hospital, hospital bed capacity for specific conditions (e.g., burn beds) in all hospitals.