

Potentially Preventable Emergency Department Utilization, Rhode Island, 2022

GAYATRI KUNCHAY, MPH; JUNHIE OH, MPH

INTRODUCTION

Emergency department (ED) visits for certain conditions are potentially avoidable and better managed in outpatient physicians' offices, clinics, or urgent care facilities.¹ "Preventable" ED visits impose considerable pressure on the healthcare system, contributing to higher ED costs and overcrowding.² A previous study in 2010 estimated that 13–27% of ED visits in the US could be preventable.³

For specific and uniform measurements of preventable ED utilizations across the nation, the Agency for Healthcare Research and Quality (AHRQ), in the U.S. Department of Health & Human Services, developed Prevention Quality Indicators (PQIs), that identifies conditions for which access to quality ambulatory care can reduce the likelihood of hospital care.⁴ This can be employed to identify regions or demographic groups where reinforcing ambulatory care systems could potentially prevent unnecessary and costly emergency care.⁴

The objectives of this report are to: (a) document the extent of preventable ED visits in Rhode Island (RI); (b) assess the preventable ED visits by patient demographics and ED admission day and time; and (c) discuss opportunities and future initiatives to reduce these potentially preventable ED visits.

METHODOLOGY

The data used for this analysis were obtained from the RI Hospital Discharge Data (HDD).⁵ All hospitals licensed by the Rhode Island Department of Health (RIDOH) are required to report financial and discharge data on a quarterly basis, using a statewide uniform reporting system. Data on inpatient admissions and ED encounters are currently submitted by 13 RI non-federal acute-care and specialty hospitals. Of these 13, 11 hospitals operate EDs from which ED data between January 1, 2022, and December 31, 2022, were extracted for this study.

AHRQ's PQIs were used to define and measure the preventable ED visits that consist of five indicators: (1) visits for Non-Traumatic Dental Conditions (NTDC), (2) visits for Chronic Ambulatory Care Sensitive Conditions (ACSC), (3) visits for Acute ACSC, (4) visits for Asthma, and (5) visits for Back Pain (Table 1). AHRQ ED PQI Beta v2023 software was downloaded from: SAS QI Software (ahrq.gov) and modified

to create the analytic dataset that included discharges from EDs but not admitted for inpatient stays (i.e., treat-and-release visits). The fifth indicator (back pain-related) was not included in this report, as explained in Table 1. SAS® v9.4 was used for descriptive statistics of the preventable ED visits (PQI 1–PQI 4), and by patient's sex, age group, race/ethnicity, and primary expected payer. Additionally, the patients' ED admission day (in a week) and time (in a day) were assessed if the visits were within or outside of the usual physician's office days and hours.

RESULTS

Figure 1 presents the ED PQIs in 2022. Of a total of 312,798 ED visits in 11 study hospitals, 21,383 (6.4%) visits were potentially preventable visits. The majority of these visits were attributed to Acute ACSC, followed by Chronic ACSC, NTDC, and Asthma. Evaluating specific diagnoses (Table 2), upper respiratory infection was the most common diagnosis, representing almost half of the visits for Acute ACSC (49.6%), and nearly a third of all preventable ED visits (29.6%). Cellulitis was the second most frequent condition.

Patient characteristics were distinct by ED PQI indicator (Table 3). For Acute ACSC, NTDC, and Asthma ED PQIs, patients were more likely to be young adults (aged 20–39 years) compared to those in other age groups. Meanwhile, among adults analyzed for Chronic ACSC, non-elderly individuals aged 40–64 years had more frequent ED visits than elderly adults aged 65 and older (53.2% vs. 46.8%). For NTDC and Asthma, males and females exhibited nearly equal likelihood of visiting ED; for Acute and Chronic ACSCs, females were more likely to seek ED care compared to males. Patients who reported their racial and ethnic background as non-Hispanic White had higher numbers of ED visits for all PQIs, than racial/ethnic minorities (the White population is the largest in the state). However, Hispanic children and younger adults' ED visits for asthma were as common as the counterpart non-Hispanic White populations (37.3% and 38.7%, respectively). Finally, patients with Medicaid showed a higher likelihood of having ED PQI visits across all conditions than those with other sources of primary payment, except for Chronic ACSC.

Figure 2 summarizes the preventable ED visits by admission day and time. Between 30% and 42% of the ED visits

Table 1. Emergency Department Prevention Quality Indicators (ED PQIs) Defined by Agency for Healthcare Research and Quality (AHRQ)

ED PQI*	Patient population by age (at ED admission)	Description [§]
ED Visits for NTDC	Children & Adults (ages ≥5 years)	Principal diagnosis of caries, gum disease, oral soft tissue conditions, caries, gum disease, oral soft tissue conditions, or dental conditions NOS; Included is tooth pain; Excluded is facial trauma.
ED Visits for Chronic ACSC	Adults (ages ≥40 years)	Principal diagnosis of asthma, chronic obstructive pulmonary disease (COPD), heart failure, acute diabetic hyper- and hypoglycemic complications, or chronic kidney disease; Principal diagnosis of lower respiratory infection with a second-listed diagnosis of COPD or asthma.
ED Visits for Acute ACSC	Children & Non-elderly adults (ages ≥3 months and <65 years)	Principal diagnosis of uncomplicated cystitis (among women ages 18 to 34 years), upper respiratory infection, chronic and acute otitis media, allergic rhinitis, viral syndrome, influenza without pneumonia, cellulitis (with no secondary diagnosis of diabetes), pyoderma, or local skin infection.
ED Visits for Asthma	Children & Young adults (ages ≥5 years and <40 years)	Principal diagnosis of asthma (with/without exacerbation or status asthmaticus), or bronchitis (with a secondary diagnosis of asthma); Excluded are cystic fibrosis, respiratory anomalies, or pneumonia.
ED Visits for Back Pain	Adults (ages ≥18 years)	Patients who visited ED >2 times within a year with principal diagnosis of back pain or back disorders, including spinal stenosis, back pain, lumbago, sciatica, neuritis or radiculitis, disorders of the sacrum, spondylosis, intervertebral disc disorders, and spinal degeneration.

* ED encounters in 11 RI hospitals that did not result in an admission to the same hospital. The measures exclude more severe cases, for which delay in seeking care to avoid the ED may harm the patient.

‡ Not included in this report: Unlike other indicators, visits for back pain require person-level data to identify patients with two or more back pain visits in a year. A single back pain encounter, which may involve severe pain or immobilization may require treatment in the ED, but subsequent visits may be avoided by correct initial diagnosis or high-quality ambulatory care.

§ Detailed information with lists of ICD-10-CM codes for each ED PQIs are available at: AHRQ QI: PQI Technical Specifications Updates

Figure 1. Preventable ED visits by ED PQI, RI HDD 2022 (Total=21,383 Visits)

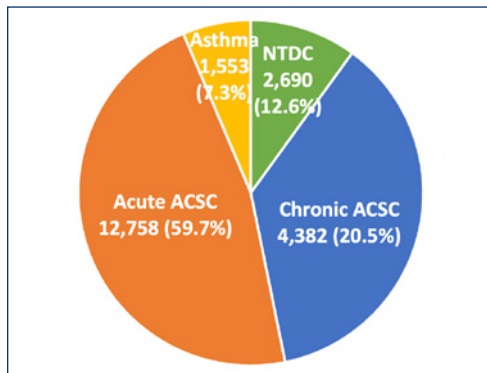


Table 2. The Most Common Diagnoses Associated with Preventable ED Visits, RI HDD 2022 (Total=21,383 Visits)

Diagnoses (ED PQI)*	ED Visits Count (%)
1 Upper Respiratory Infection (ED PQI-Acute ACSC)	6,329 (29.6.)
2 Cellulitis (ED PQI-Acute ACSC)	3,012 (14.1)
3 NTDC	2,690 (12.6)
4 Influenza (ED PQI-Acute ACSC)	2,599 (12.2)
5 Asthma (ED PQI-Asthma)	1,553 (7.3%)

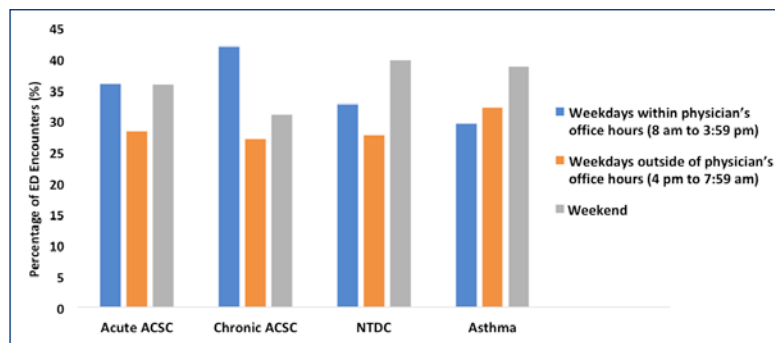
* Detailed information with lists of ICD-10-CM codes for each ED PQIs are available at: AHRQ QI: PQI Technical Specifications Updates.

Table 3. Patient Characteristics by ED PQI, RI HDD 2022

Patient Characteristic*	ED PQI			
	Acute ACSC Count (%)	Chronic ACSC Count (%)	NTDC Count (%)	Asthma Count (%)
Age Group (Years)				
0–4	1,926 (15.1)	*	*	*
5–10	1,616 (12.7)	*	85 (3.2)	507 (32.7)
11–19	1,638 (12.8)	*	120 (4.5)	280 (18.3)
20–39	4,739 (37.2)	*	1,436 (53.4)	766 (49.3)
40–64	2,839 (22.3)	2,331 (53.2)	891 (33.1)	*
≥65	*	2,051 (46.8)	158 (5.9)	*
Sex				
Male	5,670 (44.4)	2,005 (45.7)	1,394 (51.8)	745 (48.0)
Female	7,088 (55.5)	2,377 (54.2)	1,296 (48.2)	808 (52.0)
Race/Ethnicity				
Non-Hispanic Black	1,541 (12.1)	969 (9.7)	445 (16.5)	252 (16.2)
Hispanic	4,267 (33.5)	1,193 (11.9)	561 (20.9)	579 (37.3)
Non-Hispanic White	5,916 (46.4)	7,400 (73.8)	1,518 (56.4)	601 (38.7)
Non-Hispanic Other	801 (6.3)	345 (3.4)	139 (5.2)	100 (6.4)
Expected Payer[†]				
Commercial	3,532 (27.7)	615 (14.0)	486 (18.1)	396 (25.5)
Medicaid	7,554 (59.2)	1,046 (23.9)	1,618 (60.2)	1,035 (66.6)
Medicare	591 (4.6)	2,435 (55.6)	334 (12.4)	29 (1.9)
Self-Pay	760 (6.0)	168 (3.8)	204 (7.6)	68 (4.4)
Other	321 (2.5)	118 (3.0)	48 (1.8)	25 (1.7)

* Each ED PQI is based on different priority population by patient's age.

† Expected primary source of payment identified in hospital's initial admission records

Figure 2. Preventable ED visits by ED Admission Day and Time, RI HDD 2022

were observed during the usual physician's office hours in weekdays (29.6% for Asthma; 32.7% for NTDC; 38.9% for Acute ACSC; 41.9% for Chronic ACSC). Greater proportions of the visits for all ED PQIs were made outside of these hours, combining admissions during weekend and in the evening through overnight hours during weekdays.

DISCUSSION

Our study using the AHRQ's proven method to identify and measure ED PQIs provides critical insights into healthcare utilization across diverse demographic groups in RI. A substantial number of yearly encounters – more than 21,000 – were potentially preventable through timely, accessible, and quality outpatient care in 2022. Furthermore, the fact that ED visits for Acute ACSC, NTDC, and asthma made up nearly 80% of the preventable ED visits during the study year supports a need to address over-reliance on emergency services for acute illnesses, NTDCs, and asthma (particularly among children and young adults).^{6,7,8} Additionally, over 20% of the preventable ED visits were among both non-elderly and elderly individuals for Chronic ACSC. This finding emphasizes the public and private health programs' efforts for better management of common chronic diseases, such as diabetes, hypertension, cardiovascular diseases, COPD, and some respiratory diseases. Notably, our findings reveal that ED visits for asthma among Hispanic children and younger adults were as common as their non-Hispanic White counterparts, which can be interpreted as a disproportionately higher rate, given the 17% representation of the Hispanic population in RI. To address these health disparities effectively, culturally competent outreach, community engagement, and initiatives aimed at improving healthcare access become imperative, promoting equitable health outcomes.⁹

Our study also reports that patients with Medicaid insurance were more likely to have ED PQI visits across various conditions. This aligns with existing literature that Medicaid, uninsured, and residents from low-income families were frequent ED users, indicative of limited access to primary and routine care.¹⁰ This finding prompts a closer examination

of the factors contributing to increased ED visits among individuals with limited healthcare coverage, necessitating policy considerations for enhanced preventive care.

Patient's seeking care in ED for ACSC during the usual physician's office hours suggests an unmet need during the timeframe when outpatient physician's offices, clinics, or urgent care facilities are available. Potential explanations for this may include challenges in finding and scheduling with a provider for same-day or next-day appointment. Conversely, ED visits during weekend and in the evening through overnight hours during weekdays

for Acute and Chronic ACSC, asthma and NTDC may be indicative of acute exacerbations or worsening symptoms that prompt individuals to seek emergency care during these days and time. Initiatives focused on improving healthcare accessibility during off-office hours, including weekends, may contribute to reducing preventable ED visits, particularly for patients who cannot seek routine care during the weekdays due to work schedule, transportation or other systemic barriers. This could involve the expansion of urgent care services, increased availability of outpatient care during evenings, and promoting community health clinics.¹¹

STRENGTHS AND LIMITATIONS

A strength of this study is use of the RI HDD, a statewide public health surveillance system. Utilizing complete discharge reports from 11 hospitals that operate EDs in RI, assessments of preventable ED utilizations among RI residents were possible. The database provides comprehensive information about patient demographics and clinical details such as principal and secondary diagnoses that explain main reasons for hospital admissions.

In comparison to existing literature, the percentage of potentially preventable ED visits in our report appears to be relatively lower. This discrepancy might be attributed to variations in software algorithms employed for the analysis of preventable ED visits in different studies and study periods. It is important to note that our analysis excluded the PQI related to "ED visits for back pain", which might have contributed to the observed lower numbers. Additionally, RI HDD does not capture information on a patient's access to primary and routine healthcare or historical utilization of outpatient services. Therefore, we were unable to further examine if treatments at EDs were directly or indirectly associated with a patient's primary care visits for ACSC. Moreover, the potentially preventable ED visits flagged as PQIs do not mean these are definitively best treatable in ambulatory care settings. Some genuinely necessitate emergency care. Medical practices may refer patients to the ED for comprehensive evaluation beyond office capacity or after an initial assessment.

References

1. Yang Y, Yu J, Liu S, et al. Predicting Avoidable Emergency Department Visits Using the NHAMCS Dataset. *AMIA Jt Summits Transl Sci Proc.* 2022 May 23;514-523. PMID: 35854758.
2. Carlson LC, Zachrison KS, Yun BJ, et al. The Association of Demographic, Socioeconomic, and Geographic Factors with Potentially Preventable Emergency Department Utilization. *West J Emerg Med.* 2021 Oct 27;22(6):1283-1290. PMID: 34787552.
3. Weinick RM, Burns RM, Mehrotra A. Many Emergency Department Visits Could Be Managed at Urgent Care Centers and Retail Clinics. *Health Aff.* 2010 Sep;29(9):1630-1636. PMID: 20820018.
4. Davies S, Schultz E, Raven M, et al. Development and Validation of the Agency for Healthcare Research and Quality Measures of Potentially Preventable Emergency Department (ED) Visits: The ED Prevention Quality Indicators for General Health Conditions. *Health Serv Res.* 2017 Oct;52(5):1667-1684. PMID: 28369814.
5. Department of Health. Hospitalization Discharge Data, 2023. [<https://health.ri.gov/data/hospitalization/discharge/>]
6. Van den Heede K, Van de Voorde C. Interventions to Reduce Emergency Department Utilisation: A Review of Reviews. *Health Policy.* 2016 Dec;120(12):1337-1349. PMID: 27855964.
7. Akinlotan MA, Ferdinand AO. Emergency Department Visits for Nontraumatic Dental Conditions: A Systematic Literature Review. *J Public Health Dent.* 2020 Sep;80(4):313-326. PMID: 33006151.
8. Johnson LH, Chambers P, Dexheimer JW. Asthma-related Emergency Department Use: Current Perspectives. *Open Access Emerg Med.* 2016 Jul;13(8):47-55. PMID: 27471415.
9. Kim K, Choi JS, Choi E, et al. Effects of Community-Based Health Worker Interventions to Improve Chronic Disease Management and Care Among Vulnerable Populations: A Systematic Review. *Am J Public Health.* 2016 Apr;106(4):23-28. PMID: 26890177.
10. Williams CA, Haffizulla F. Factors Associated with Avoidable Emergency Department Visits in Broward County, Florida. *Cureus.* 2021 Jun 11;13(6). PMID: 34277214.
11. Appropriate ED Utilization Leading to Better Care Coordination, 2022. [<https://www.ajmc.com/view/appropriate-ed-utilization-leading-to-better-care-coordination>]

Authors

Gayatri Kunchay, MPH, Hospital Discharge Data Program Epidemiologist, Center for Health Data and Analysis (CHDA), Rhode Island Department of Health.

Junhie Oh, MPH, Hospital Discharge Data Program Manager, Senior Epidemiologist, Center for Health Data and Analysis (CHDA), Rhode Island Department of Health.

Correspondence

Gayatri Kunchay, MPH

Gayatri.Kunchay@health.ri.gov