

Impact Of Primary Care Utilization And Insurance On Emergency Department Visits

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Abstract

The emergency department (ED) is uniquely situated to provide treatment for situations such as acute episodes of illness, injury, and symptoms resulting from a chronic disease episode. Health care services need to be quickly accessible to properly triage the patient for stabilization and discharge. Factors delaying care include patient overcrowding, workforce shortages, and lack of insurance, which leads to rising health costs for all stakeholders. This study examines the correlation between primary care utilization and ED visits and the role insurance plays. This research was conducted by using secondary data from the California Health Interview Survey (CHIS), 2021, and was thus limited to adult California patients [23]. Results from this research show a strong correlation between primary care utilization and insurance and ED use. Therefore, the first hypothesis is that an increase in primary care utilization reduces ED visits. The second hypothesis is that those individuals insured utilize more primary care for preventative care and, therefore, experience fewer ED visits. The null hypothesis in this study is that the independent variables are not associated with the dependent variable.

Keywords: Emergency department, emergency room, Medicare, Medicaid, primary care, healthcare insurance

Introduction

Over the last few decades, emergency departments (ED) have become one of the most impacted treatment locations for patients [20]. Hsia (2023) revealed that emergency department (ED) visits outpaced California population growth from 2011 to 2019 and the number of Medicaid beneficiaries (37.4%) outgrew all other payer groups accounting for the most ED visits and the largest increase in visit rate. Additionally, Medicaid visits accounted for approximately 41.5% of all ED visits, even though this group comprised only 25.1% of the 2019 California population [8].

Adding to ED patient use is non-emergent care, which is a concern for EDs due to the number of patients served and dollars spent. Overall, there were more than 143 million ED visits in 2018, and of those, only 20 million ended in admission to the same hospital and over 123 million ended in discharge. Other reasons people seek care in the ED include the challenge of determining the urgency of symptoms such as chest or abdominal pain. These situations contribute to continued ED use despite primary care efforts which show little evidence in having a sizable impact in the reduction of ED visits [27].

The COVID-19 pandemic in 2020 showed a large decrease in ED utilization (i.e., 42%) across the country from April 2019 to April 2020 [1]. Furthermore, during March 2020 – April 2020 nonfatal injury ED visits decreased by 31% compared to March and April 2019 and the total number of nonfatal injury related ED visits declined 15% in 2020 compared to 2019 [5]. In addition, the decline in life-threatening conditions such as heart attack (23%), stroke (20%), and

hyperglycemic crisis (10%) occurred 10 weeks after COVID-19 was declared a national emergency, suggesting individuals may have avoided or were unable to access ED care even in medically acute circumstances [13]. Given the need to treat many COVID-19 patients during peak infection periods and limited elective procedures, the pandemic seems to have had a large impact on emergency care service use through 2020 (HHS, 2021).

ED visits in 2017, both preventable (e.g., principal diagnosis connected to mental health, alcohol, substance abuse, dental condition, and asthma for people aged 2-39) and non-preventable (e.g., choking, head injury, injury to neck or spine, severe burn or chest pain, seizure), cost the U.S. approximately \$76.3 billion (Agency for Healthcare Research and Quality, n.d.; [24]). Despite this huge expense, there seems to be limited data available identifying the characteristics associated with preventable ED use.

Factors to consider are individuals living in lower-income households who, on average, visited EDs for preventable reasons roughly 2.5 times more often than those with higher incomes and people with lower education, less than a high school diploma, made three times more preventable ED visits presumably due to less disposable income along with other socio-economic characteristics such as lack of access to transportation and the Internet [25]. Additionally, individuals who were unemployed made roughly 2.5 times as many preventable ED visits as those who were employed [25].

Primary care in California is associated with reduced ED use and fewer hospitalizations [3]. When primary care is used appropriately,

it can capture early disease onset, treat existing medical conditions before worsening, and assist people with living healthier lives. In other words, primary care can yield positive benefits through proactive attention to a person's health which can give patients better mental and physical health outcomes. Although barriers exist to utilizing primary care (e.g., accessibility, lack of insurance, socioeconomic status, etc.), there needs to be a heightened urgency to promoting its use, which would lead to lower acute healthcare events. An additional benefit to increased use of primary care services would be a reduction of overcrowding in EDs, thereby releasing resources to those patients needing its services [4]. Another consideration is the amount of ambulatory care sensitive conditions (ACSC) contributing to the overcrowding of EDs.

ACSCs are means to measure the benefit of primary care and can be avoided if patients take advantage of their services in a timely and appropriate manner [19]. Some examples of ACSC conditions are congestive heart failure, diabetes, and chronic obstructive pulmonary disease (COPD). These conditions, when routinely monitored by primary care services, can be effectively managed, and keep most patients out of the ED and hospital [9].

Purpose of the Study

All stakeholders in the healthcare community should understand that the use of primary care for preventative medicine can lead to improved quality of life and decreased healthcare expenses [2,29]. If primary care is not used effectively, then alternative methods need to be explored to help decrease the rising trend of ED costs. Therefore, the purpose of this study was to determine if primary care is a driver of ED utilization, which studies have shown to be the case due to limited access, bad patient experiences, and high out-of-pocket costs, which make ED use the preferred choice of treatment over primary care [18].

However, with the worst of the COVID gone and the less burden of the public health emergency use, it is most likely that the use of ED might ease the overrun of emergency department across the nation. Research has also suggested that a significant number of patients on hold simple die in EDs and it is considered to be the wrong place for the long-term care of complex problem; as even with those with common everyday problems [12].

Problem Statement

Emergency department (ED) expenditure is a significant portion of overall healthcare spending. For example, ED spending in 2006 was \$79.2 billion and \$136.6 billion in 2016, with a population-adjusted annualized rate of 4.4%, as compared to 1.4% for the total U.S. spending on healthcare costs [21]. Some of these costs reflect resources spent in the ED which should be focused on individuals acutely ill rather than those who could be treated in the primary care environment.

Wu et al. (2023) state that people who enrol in a free care plan use 42% more ED services than those enrolled in the highest co-insurance

plan, and cost-sharing may contribute to reduced ED utilization among patients with severe conditions, indicating a possible unintended decrease in appropriate and inappropriate care use for people who are sicker and have low incomes.

Research Design

This study used data from CHIS which is a cross-sectional survey dataset widely accepted for public health studies on California's population, offers high-quality, objective, and evidence-based research and data to be used for making informed decisions, and provides useful analytics to policymakers for studies [23]. This study determine the relationship between primary care and ED utilization and the role of insurance on ED visits. ED utilization was quantified by counting each emergency room visit as a separate event. The study also evaluated if being uninsured is a significant factor in ED usage. Parameters for insurance included people insured for less than 12 months was not considered as insured for the year. Therefore, only individuals with insurance all year were considered in the insured pool.

Methods

The CHIS data was analyzed and the hypotheses was tested by using Statistical Package for the Social Sciences (SPSS); including performing a crosstabulation and chi-square test. The chi-square test determines if two variables are related to each other, how significant the relationship is, and whether there is a relationship between the dependent and independent variables.

This study also examined the correlation between primary care utilization and ED visits and what role insurance plays. When primary care functions as a proactive approach to individual health, it is believed that decreased ED visits occur [11]. If this correlation is found, then mental and physical health programs can be designed to ensure primary care use is maximized.

Another consideration is the use of insurance, which impacts ED use because contracts between health plans and primary care physicians may include incentives for optimized primary care utilization, which has led to questions regarding the use of primary care services [6]. If primary care implementation is not effective in decreasing ED utilization, then continued research must be done to discover better strategies. The independent variables are i) preventive care visits in the past year, ii) uninsured individuals in the past 12 months, and iii) people with insurance. These variables allow a determination if they are significant drivers of the dependent variable, ED visits. Preventative care is being used as a proxy for primary care utilization, with the assumption that preventative care is generally performed in a primary care office.

The dependent variable in this study was ED utilization.

Data Analysis

The CHIS data survey was used to test the relationship between ED visits and primary care utilization [23]. It is also used to test the relationship between ED visits and the use of insurance. The first hypothesis in this research is that an increase in primary care utilization reduces ED visits, and the second hypothesis is that

insured individuals utilize more primary care and, therefore, experience fewer ED visits due to increased preventative care. The null hypothesis in this study is that the independent variables are not associated with the dependent variable.

The summary table for analysis is presented below in Table 1:

Table 1: Summary of Statistical Analyses in Study

Hypothesis	Dependent Variable	Independent Variable	Statistical Analyses
1. Individuals who utilize primary care incur fewer ED visits	ED Visits	Primary Care Utilization	Chi-square test
2. Individuals with insurance have less ED visits	ED Visits	Insurance	Chi-square test

Analysis and Findings

The CHIS 2021 dataset recorded a total of 24,453 observations and was used to perform a crosstabulation and chi-square test [23]. The crosstabulation between those who had a preventative care visit ‘Yes’ and ‘No’ ED visit(s) within the past year had the highest observed count at 12,808 [23]. This result confirms the first hypothesis, which was that a preventative care visit reduces the likelihood of visiting the ED. Although the observed counts are an encouraging sign to reject the null hypothesis, the Chi-Square test confirmed if there is a significant association between preventative care and an ED visit. The value of the Pearson Chi-Square test resulted in 161.518, $df = 1$, and the p-value is $<.001$. Results of the Chi-Square test and p-value show that the result can be considered significant and indicates a strong correlation between the two variables. These results allow us to reject the null hypothesis for the first hypothesis that tests the relationship significance between primary care utilization and ED visits. The relationship is significant and substantiates the use of primary care and decreased ED visits.

The second hypothesis tested was that having insurance would reduce ED utilization. CHIS data divides the uninsured individuals in the past 12 months variable into 4 different categories: Ages ≥ 65 , uninsured all year, uninsured part-year, and insured all year [23]. For the purposes of this study, uninsured all year and uninsured part-year were combined because no data was given to detail when insurance coverage dropped or when the ER visit occurred.

In the crosstabulation analysis, the leading cross section is the combination of ‘No’ ER visits within the past year and ‘Yes’ insured all year, with an observed count of 13,502. This result confirms the hypothesis that having insurance reduces the likelihood of ED utilization. Furthermore, the chi-square value is 87.328, $df = 4$, and the p-value is $<.001$, further determining a significant correlation to reject the null hypothesis. This confirms that the correlation is strong between carrying insurance and ED utilization.

Discussion and Conclusion

An important consideration is the impact the Affordable Care Act

(ACA) has had on primary care utilization. Given that the ACA was one of the biggest disruptions to the U.S. healthcare industry, there should now be substantial data available to analyze if its goals for the use of preventative care, improved quality of life, and reduced ED usage was met. Giannouchos et al., (2021), asserted that the ACA was successful in reducing ED patient costs for non-emergency visits through increased insurance availability to primary care physicians for the previously uninsured individuals. In New York, over a five-year period, from 2011 to 2016, ED visits increased by 3% for previously uninsured patients, including non-emergency care [7]. This shows that it is counterproductive for people to not utilize primary care services which ultimately would decrease ED visits. Additional research, pre and post ACA, found that ED utilization increased across all age groups for low acuity patients [10]. Low acuity patients were included in the avoidable category because their condition at the ED visit was treatable or better managed at a primary care office.

Wu et al., (2023) suggested that cost-sharing leads to greater reductions in nonurgent and urgent ED visits (i.e., 8.9% and 5.9% respectively) which implies that some necessary ED care use may have been discouraged in public hospitals. This finding raises concern about the potential underuse of ED care, which could lead to detrimental health outcomes. The Department of Health & Human Services (HHS) (2021) ED report to Congress suggested that the numbers and rates of ED visits vary by patient and community characteristics, suggesting that patients seek ED care from adults, people between 18 and 24 years of age, those aged 65 and over, and particularly those over 75 who are generally the most likely to have reported visiting an ED in the past year. Despite efforts to decrease the number of ED patient visits each year, it has been determined that overall trends suggest little advancement in that area (HHS, 2021). Payer trends show that ED utilization is also related to insurance coverage and those aged 65 and under, with Medicaid, were about two times as likely to have gone to the ED in the past year compared to individuals who were insured privately (National Center for Health Statistics, 2019). Factors contributing to this included the higher

disease rate in the Medicaid population, barriers to accessing other sources of care, such as outpatient providers for low-income populations, and the generally significantly higher cost-sharing for ED use among those with private insurance. It is important to note that uninsured individuals have been found to have only slightly higher ED utilization rates versus those who are privately insured and have lower utilization rates (HHS, 2021).

Furthermore, HHS (2021) reported that the percent of ED visits with Medicaid as the primary payer for the years 2009 to 2018 are shown

in **Table 2 below and can be summarized as:**

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

Table 2: Percent of ED visits with Medicaid as the primary expected payer, United States, 2009-2018

Year	Admissions (Non- MH/SUD)	Treat-and-release (Non- H/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.

One factor of caution is that the MH/SUD categorization relies on ICD-9-CM codes from 2008 through the third quarter of 2015 and ICD-10-CM codes from 2016 to 2018.

There are known discontinuities between the two coding systems that include a transition period as the new codes were adopted [22]. Therefore, care should be taken in interpreting changes before and after the ICD transition.

Additionally, the U.S. Department of Health and Human Services (HHS), (2021), identified ten top diagnoses by ED visit, percentage, and age of persons for all visits. When the MH/SUD visits were split into primary versus secondary diagnosis, the following results were discovered:

- Many of the most common diagnoses for non-MH/SUD ED visits resulted in a hospital admission for conditions requiring tertiary care (e.g., septicemia and acute myocardial infarction). Other conditions, such as pneumonia and skin and subcutaneous tissue infections, were thought to be better treated initially in an ambulatory setting, but once unstable, a hospital admission may be necessary (HHS, 2021).
- The largest segment in the study, non-MH/SUD treat-and-release, approximately five percent, consisted of conditions such as abdomen/digestive issues, followed by upper respiratory infections, injuries, sprains/strains, and chest pains (HHS, 2021). The severity of a patient’s underlying condition when they exhibit

symptoms such as abdominal and chest pain was often difficult to ascertain until diagnostic procedures, generally available in hospitals, were undertaken.

- For other conditions, such as more minor injuries, treatment in ambulatory settings may have been appropriate, but only when other types of ambulatory providers (e.g., primary care providers) were not available (as discussed above).
- The role that urgent care centers and retail clinics play in providing an alternative source of ED care is discussed in Section VI, below.
- For visits with MH/SUD as a primary diagnosis, almost a quarter were alcohol related, followed by anxiety/fear-related disorders, depressive disorders, suicidal ideation, and schizophrenia (HHS, 2021).
- Visits with MH/SUD as a secondary diagnosis were a mix of common diagnoses, with unspecified chest pain as the most common at over 6%, followed by septicemia, abdominal/digestive issues, urinary tract infections, and skin/subcutaneous tissue infections (HHS, 2021).

There have been a variety of efforts to discourage “non-emergency” or “inappropriate” ED use, such as higher insurance copayments for ED visits 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 (HHS, 2021). Another strategy is to focus on superusers or hot spots which target the few individuals or communities who use the ED very frequently and are responsible for a disproportionate share of costs [14]. One such subset is individuals with MH/SUD needs. By focusing intensively on these patients, the hope is that health outcomes can be improved while lowering overall costs (HHS, 2021).

In conclusion, this research explores the relationship between primary care utilization & insurance on ED visits to lessen overcrowding and costs incurred through ED use. Too many resources are spent on avoidable ED visits that could have been monitored and effectively treated in primary care settings [17]. The two hypotheses were does primary care utilization impact ED visits and how does insurance

effect ED use. Using survey data from 2021, observations concluded that both primary care utilization and insurance have a strong correlation to ED use. The analysis shows an increase in primary care utilization and decreased ED visits.

Similarly, insurance does act as a driver for lower ED utilization. The chi-square test for primary care utilization and ED yielded a value of 161.518 and a corresponding p-value of <.001. Chi-square tests for carrying insurance and ED use yielded a result of 87.328 with a corresponding p-value of <.001. The analysis and findings allowed a rejection of the null hypothesis, and both hypotheses were accepted as true. This indicates a need for the healthcare community to advocate for primary care utilization to lessen the burden on emergency departments.

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