Characteristics of Occasional and Frequent Emergency Department Users

Do Insurance Coverage and Access to Care Matter?

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Objective: The objective of this study was to explore how insurance coverage, access to care, and other individual characteristics are related to the large differences in emergency department (ED) use among the general population.

Materials and Methods: We used the 1997 and 1999 National Survey of America's Families, a nationally representative sample. People were classified into 3 ED use levels based on the number of visits over the 12 months before the survey: non-ED users (zero visits), occasional users (1 or 2 visits), or frequent users (3 or more visits). We used a multinomial logit model to estimate the effect of insurance status and other factors on levels of ED use, and to compute the odds ratios of being occasional and frequent users as opposed to nonusers among various subpopulations.

Results: People in fair/poor health are 3.64 times more likely than others to be frequent ED users as compared with nonusers. The uninsured and the privately insured adults have the same risk of being frequent users, but publicly insured adults are 2.08 times more likely to be frequent users. Adults who made 3 or more visits to doctors are 5.29 times more likely to be frequent ED users than those who made no such visits.

Conclusion: The uninsured do not use more ED visits than the insured population as is sometimes argued. Instead, the publicly insured are overrepresented among ED users. Frequent ED users do not appear to use the ED as a substitute for their primary care but, in fact, are a less healthy population who need and use more care overall.

Key Words: emergency department, insurance, access to care

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Between 1992 and 2001, emergency department (ED) visits in the United States increased by 20% to 108 million visits, whereas the number of EDs decreased 15% to 3934.[1] Hospitals with EDs could not easily escape this increasing burden in light of provisions of the 1986 Emergency Medical Treatment and Active Labor Act (EMTALA) that require hospitals to perform examinations and provide stabilizing treatment before a person can be transferred to another provider.

Despite the growing burden on EDs, most people do not use an ED in any given year. In 1999, for example, the National Health Interview Survey (NHIS) showed that only 17% of the noninstitutional civilian population visited an ED and only 5% made 2 or more visits.[2] Similarly, the data used in this study (discussed subsequently) also show that approximately 1 in 5 adults used an ED annually and approximately 7% visited an ED 2 or more times during a 12-month period.

Conventional wisdom might suggest that these "frequent" ED users are more likely to be uninsured and to use the ED as a source of regular medical care.[3–9] However, NHIS indicated that less than 15% of ED users were uninsured,[1] and a hospital-based study found that frequent ED patients are no more likely than the ED population in general to be uninsured.[10] In addition, some recent hospital-based studies found that frequent ED visits are associated with higher, not lower, use of other health resources.[11,12] It remains to be seen if the same effect of insurance coverage on ED utilization is evident, and if the association between ED and non-ED use can be established in population-based studies.

Policymakers interested in reducing ED overcrowding and curbing the use of the ED for nonemergent care will benefit by understanding what types of people frequently visit EDs. The literature on ED utilization is mostly hospital-based and uses convenience samples of patients who visited the ED. These hospital-based studies can examine issues related to appropriateness of care and other clinical matters, but lack the ability to contrast characteristics of ED users with individuals who did not visit an ED.[1,5,10,12–17] In addition, these studies are often limited to selected hospitals or states and thus are not nationally representative. Some population-based studies use survey data to examine ED utilization.[18–21] However, these population-based analyses tend to focus on specific

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subgroups (ie, Medicaid enrollees or children) and do not differentiate between frequent ED users and those who only visited the ED occasionally.

In this article, we use a nationally representative sample to explore who the occasional and frequent ED users are and how they differ from the nonusers as well as from each other along various dimensions. Specifically, we seek to answer the following research questions: 1) Are occasional and frequent ED users different from nonusers in terms of basic demographics and health conditions? 2) Are the uninsured more likely than others to use EDs? 3) Do frequent ED users rely on EDs as a substitute for other ambulatory care?

MATERIALS AND METHODS

Data and Sample Criteria

Our main data sources are the 1997 and 1999 rounds of the Urban Institute's National Survey of America's Families (NSAF). NSAF is a nationally representative household survey that collects economic, household, and health information on over 100,000 children and nonelderly adults in each year.[22] The NSAF combines telephone surveying with in-person interviews. The complex sample design requires that all of our analyses are weighted using the method of balanced and repeated replications to produce nationally representative estimates and correct standard errors.[23] We supplement the NSAF data with several other data sources such as the Area Resource Files and American Hospital Association annual hospital surveys to obtain local healthcare and labor market characteristics.[24,25]

Because the distribution of ED visits remained relatively stable between 1997 and 1999, we pooled the 2 rounds for our analysis to increase estimation precision. The analytic sample includes adults between the ages of 18 and 64. We also restrict our analysis to adults who had the same insurance coverage during the 12 months before the survey because 1) our measure of ED use refers to use during this time period, and 2) this avoids potential estimation bias that might arise because uninsured people might sign up for Medicaid or state programs while they were being treated at the ED. This exclusion criterion eliminates 11% of the survey respondents, and our final sample consists of 89,626 adults. Imposing this restriction on the analytic sample allows us to treat insurance coverage as exogenous to ED use.

Variable Definitions

Level of Emergency Department Use

On the NSAF survey, a respondent was asked how many times he or she visited the ED in the past 12 months. Based on answers to this survey question, we categorized people into 3 ED use levels: non-ED users (those with no visits), occasional ED users (those with 1 or 2 visits), and frequent ED users (those with 3 or more visits). The rationale behind our approach is that the need for a small number of ED visits (eg, as a result of an accident or a clear medical emergency) can happen to anyone, but that having 3 or more ED visits is more likely to reflect a pattern of dependence on the ED as a source of care. NSAF data shows that 80% of adults did not visit the ED, 17% made 1 or 2 visits, and 3% were frequent ED users during the 12-month period. Our survey of the literature showed that there has not been a standard way of categorizing ED use levels. Some prior hospital-based studies have defined frequent ED users as having 4 or more visits. However, that definition resulted in too small a subgroup to be analyzed with the multivariate methods used in this study.[10,12,26] There are other studies that categorize ED users into 1-time and multiple-time ED users.[1,21,27] In sensitivity analyses, we analyze our data using this broader definition of frequent ED users and found results similar to those reported in this paper.

Insurance Coverage

We use information on health insurance coverage during the past 12 months to classify individuals who maintain the same insurance status for the entire period into 1 of 3 mutually exclusive groups: 1) private insurance (this includes both employer-sponsored insurance and nongroup insurance), 2) public insurance (this includes Medicaid and any other state-specific programs), and 3) uninsured.

Access to Non-Emergency Department Ambulatory Care

We consider 2 types of access to care measures. First, we examine the level of non-ED visits to doctors or other health professionals. Based on the reported number of visits, we classify adults into 3 categories: 1) those with no outpatient visits, 2) those with 1 to 2 visits, and 3) those with more than 2 visits. If people use the ED as a substitute for other ambulatory care, we might expect to see a negative association between the level of non-ED visits and the level of ED visits. Second, we examine perceived access to care using a measure of unmet need based on having reported not getting or postponing medical care or surgery. This binary variable takes on the value of 1 if a respondent reported having unmet medical need and 0, otherwise.

Statistical Analysis

We conducted both descriptive and multivariate analyses. In our descriptive analysis, we summarized characteristics of the nonelderly adult population and compared them across the 3 ED use levels (nonusers, occasional users, and frequent users). First, we examined individual demographic characteristics, including age, gender, race/ethnicity, citizenship, education, and income. We also explored the individual's family structure: whether the person is a childless single adult, a single

parent, or married with or without children. Next, we examined the individual's health conditions such as whether they reported being in fair or poor health or having an activity limitation. Finally, we studied the distribution of insurance coverage. We present the distribution of these characteristics for the entire nonelderly adult population, but our analysis focuses on comparisons among frequent, occasional, and nonusers of EDs.

We use odds ratios (OR) to show how individual characteristics are associated with being a frequent or occasional ED user as opposed to a nonuser. Take the comparison between a black and a white adult, for example. The odds ratio is the odds of a black adult being a frequent ED user as opposed to a nonuser relative to the same odds for a white adult. If we compute the odds ratio using raw data, it will be confounded by other factors. For example, this odds ratio might be high because blacks, on average, are poorer than whites. We estimate the effect of a given factor such as race on ED use levels by controlling for other individual characteristics in a multivariate analysis. Specifically, we use a multinomial logit model to examine the odds of being a frequent ED user or an occasional user as opposed to a nonuser for a given subgroup.[28] The dependent variable in the multinomial logit model is the 3-level ED use indicator.

In our core analysis, we examine the effect of a given factor such as insurance coverage on ED use levels while controlling for other individual and area characteristics. In addition, we present an exploratory analysis of the relationship between ED use levels and the use of non-ED ambulatory care and perceived unmet needs.

In the core reduced-form model, we include only variables that are clearly exogenous to ED use. In other words, we exclude variables such as non-ED utilization and perceived unmet need that could be functions of the same observed and unobserved factors that also influence ED use. The exogenous variables include demographic characteristics, family structure, working status (nonworking, work part-time or full-time), health conditions, and insurance coverage. Note that we treat insurance coverage as exogenous because we exclude people who change insurance status during the 12-month period, eliminating the possibility that ED visits drive the insurance choice. We also include local health market characteristics such as health maintenance organization (HMO) penetration, provider supply, specialty mix, and regional indicators in this reduced-form model. The statistical significance of these market characteristics is likely to be overstated because the analysis is at the individual level instead of at the market level.[29] However, although the relationships between these local health market characteristics and ED use were often statistically significant, they suggested a very small quantitative effect and are not reported.

To determine whether frequent ED users rely on EDs as a substitute for other ambulatory care, we performed an exploratory analysis of the relationship between ED use and non-ED use by building on the reduced-form model. In separate models, we examined the roles of non-ED use and perceived unmet need. Adding the 2 access variables separately allowed us to generate coefficients while minimizing the potential estimation problem that could arise if levels of ED use influence a person's utilization of outpatient care or perceived unmet needs. However, it is important to note that although we can establish the association between ED use levels and non-ED use levels, we cannot establish causality. Unobserved factors could affect ED and non-ED use as well as perceived unmet needs in the same direction.

RESULTS

Reduced-Form Model Results

Demographic and Family Characteristics by Emergency Department Use Levels

Table 1 shows that white adults represent 75% of the nonusers, 71% of occasional users, but only 63% of frequent users. In contrast, blacks represent 10% of the nonusers, 14% of the occasional users, and 22% of the frequent ED users. Not surprisingly, the race/ethnicity distribution of nonusers is very similar to that of the overall population, because nonusers represent 80% of the entire population. The multinomial logit results indicate that black adults have higher odds than white adults of being occasional users as compared with non-ED users (odds ratio [OR] = 1.31, $P < 0.001$). The difference between these 2 racial groups is even greater when comparing frequent users to nonusers (OR = 1.67, $P < 0.001$). Adults in other racial groups are no more likely than white adults to be occasional or frequent ED users.

Noncitizens are far less likely than U.S.-born citizens to be ED users (OR = 0.63, $P < 0.001$ for occasional users and OR = 0.40, $P < 0.001$ for frequent users). Results also show that, relative to adults with no high school diploma, adults with at least a college degree have lower odds of being both occasional and frequent users (OR = 0.78, $P < 0.001$ for occasional users and OR = 0.64, $P = 0.001$ for frequent users).

Table 1 further shows that income is negatively associated with ED use. Among nonusers, 60% had incomes above 300% of the Federal Poverty Line (FPL; nonpoor), 30% had incomes between 100% and 300% of the FPL (near-poor), and 9% had incomes below 100% of the FPL (poor). Relative to the nonpoor, near-poor, and poor adults both have higher odds of being occasional ED users (OR = 1.12, $P = 0.002$ for near-poor adults; OR = 1.17, $P = 0.014$ for poor adults). The odds of frequent ED use is even higher among those lower-income groups when compared with non-

TABLE 1. Distribution of Individual Characteristics by Emergency Department (ED) Use Levels*

	Share of Overall Population	Share of Population by ED Use Level			Regression-adjusted difference (in odds ratio)	
		0 ED visit	1 or 2 ED Visits	3+ ED visits	1–2 Visits vs. 0 Visit	3+ Visits vs. 0 Visit
Race and ethnicity						
White, non-Hispanic	0.74	0.75	0.71	0.63	1.00	1.00
Black	0.11	0.10	0.14	0.22	1.31†	1.67†§
Hispanic	0.10	0.10	0.10	0.12	1.00	1.02
Asian and others	0.04	0.05	0.04	0.03	0.96	0.94
Citizenship						
US-born citizen	0.90	0.89	0.91	0.93	1.00	1.00
Foreign-born citizen	0.04	0.04	0.04	0.03	0.96	0.82
Foreign-born alien	0.06	0.07	0.05	0.04	0.63†	0.40†§
Education						
No high school diploma	0.45	0.43	0.49	0.60	1.00	1.00
At least high school diploma	0.29	0.29	0.31	0.29	1.03	1.00
BA or above	0.26	0.28	0.20	0.11	0.78†	0.64†
Income						
Nonpoor (>300% PL)	0.58	0.60	0.52	0.30	1.00	1.00
Near-poor (100–300 PL)	0.31	0.30	0.35	0.41	1.12†	1.62†§
Poor (<100% PL)	0.11	0.09	0.14	0.29	1.17‡	1.81†§
Family structure						
Single without kids	0.32	0.31	0.36	0.37	1.00	1.00
Single parent	0.06	0.06	0.08	0.16	1.13‡	1.43†§
Married with kids	0.34	0.35	0.32	0.28	0.96	1.07
Married without kids	0.27	0.28	0.23	0.18	0.91	0.98
Health status						
Good, very good, or excellent health	0.88	0.91	0.81	0.56	1.00	1.00
Fair or poor health	0.12	0.09	0.19	0.44	1.91†	3.64†§
Disability status						
No work limitation	0.87	0.90	0.80	0.53	1.00	1.00
Have work limitation	0.13	0.10	0.20	0.47	1.85†	4.07†§
Insurance coverage						
Uninsured	0.14	0.14	0.15	0.18	1.00	1.00
Private coverage	0.81	0.82	0.76	0.53	1.11‡	0.95
Public coverage	0.05	0.04	0.09	0.29	1.27†	2.08†§
Unweighted sample size	89626	70397	16094	3135		
Weighted percent population	100%	80%	17%	3%		

*Additional control variables in the multinomial logit model are: age, gender, rural/urban residence, regional indicators (Northeast, Midwest, South, West), work status (part-time or full-time); number of physicians per capita in a county, percent of general/family practitioners in a county, number of hospital beds per capita in a county, percent hospital beds in a county that are public, HMO penetration at the county level.

†P value < 0.01 for the relative risk ratio as compared with non-ED users.

‡P value < 0.05 for the relative risk ratio as compared with non-ED users.

§P value < 0.05 for the relative risk ratio as compared with occasional ED users

poor adults (OR = 1.62, $P < 0.001$ for near-poor adults; OR = 1.81, $P < 0.001$ for poor adults).

In terms of family structure, married adults (with or without children) have odds ratios of being ED users that are comparable to single adults with no children. However, relative to single adults with no children, single parents have higher odds of being either occasional or frequent ED users compared with being nonusers (OR = 1.13, $P = 0.04$ for

occasional users and OR = 1.43, $P = 0.002$ for frequent users).

Health and Disability Status by Emergency Department Use Levels

Table 1 reveals that both occasional and frequent ED users are more likely to report worse health conditions than nonusers. Although only 9% of nonusers report being in fair or poor health and 10% report having activity limitations, the shares increase substantially to 44% and 47%, respectively, among frequent users. Adults with fair or poor health have higher odds of being occasional users than nonusers (OR = 1.91, $P < 0.001$) and are even more likely to be frequent users than nonusers relative to those with good, very good, or excellent health (OR = 3.64, $P < 0.001$). There is a similar pattern between adults with activity limitations and those without them.

Insurance Coverage

Lastly, Table 1 shows that among non-ED users, 82% have private coverage and 14% are uninsured. Among frequent ED users, the proportion of people with private coverage drops to only 53%, whereas the uninsured share increases slightly to 18%. The most dramatic differences occur among the publicly insured. Although only 5% of the nonelderly adult population is publicly insured, the share with public insurance varies widely across ED use levels; people with public coverage represent only 4% of nonusers and 9% of occasional users, but represent 29% of frequent users.

Controlling for other individual and market variables, we find that the privately insured have a slightly higher odds of being occasional users than the uninsured (OR = 1.11, $P = 0.041$), but are not more likely to be frequent users (OR = 0.95, $P = 0.681$). In other words, uninsured and privately insured adults are equally likely to be frequent ED users. However, publicly insured adults have higher odds than the uninsured to be either occasional or frequent ED users as compared with nonusers after controlling for other factors (OR = 1.27 for occasional users, $P = 0.005$; OR = 2.08 for frequent users, $P < 0.001$). Recall that these high odds ratios are not the result of people who sign up for Medicaid after their first visit to the ED, because we eliminated people who changed insurance status during the 12-month period before the survey.

To further investigate the nature of insurance coverage, we contrast the effects of public and private coverage for those under managed care with those under fee-for-service. We use responses to NSAF questions on HMO enrollment and care received through physician networks to classify insured adults as being in some form of managed care. We find similar insurance effects with respect to ED use regardless of the individual's managed care status (results not shown).

Exploratory Analysis of Access to Care by Emergency Department Use Levels

We present our exploratory analysis of access to care in Table 2. It shows that, among nonusers, the number of non-ED visits are fairly evenly distributed, with 26% reporting no visits, 39% reported 1 to 2 visits, and 35% reported having 3 or more visits during the 12-month period before the survey. The distribution of non-ED visits becomes more skewed among occasional ED users: 16% reported no visit, 30% reported 1 to 2 visits, and 53% reported 3 or more visits. Finally, a large majority of frequent ED users (76%) had 3 or more visits to doctors or other health professionals.

The odds ratio of being an occasional ED user as opposed to a nonuser is greater for adults with 1 to 2 non-ED visits than for adults with no non-ED visits (OR = 1.47, $P < 0.001$), but the odds of being a frequent ED user is not

TABLE 2. Distribution of Access to Care by Emergency Department (ED) Use Levels

	Share of Overall Population	Share of Population by ED Use Level			Regression-adjusted difference (in odds ratio)	
		0 ED Visit	1 or 2 ED Visits	3+ ED Visits	1–2 Visits vs. 0 Visit	3+ Visits vs. 0 Visit
Actual access to care						
0 doc/health professional visit	0.24	0.26	0.16	0.11	1.00	1.00
1–2 doc/health professional visits	0.36	0.39	0.30	0.12	1.47†	1.03§
3+ doc/health professional visits	0.39	0.35	0.53	0.76	2.71†	5.29†§
Perceived access to care						
No unmet medical need	0.93	0.94	0.89	0.81	1.00	1.00
have unmet medical need	0.07	0.06	0.11	0.19	1.67†	2.38†§

†P value <0.01 for the relative risk ratio as compared with non-ED users.
§P value <0.05 for the relative risk ratio as compared with occasional ED users

significantly different (OR = 1.03, $P = 0.867$). On the other hand, adults who have 3 or more visits to doctors or other health professionals have much higher odds of being both occasional and frequent ED users (OR = 2.71 for occasional users, $P < 0.001$; and OR = 5.29 for frequent users, $P < 0.001$). It is important to remember that the positive association between ED and non-ED use levels should not be construed as a causal effect, because the same underlying factors are likely to drive the 2 utilization measures in the same direction.

The second panel in Table 2 shows that people with unmet medical needs are more likely to use an ED for care. Only 6% of non-ED users report having unmet medical needs, but 11% of occasional users and 19% of frequent users report unmet needs. The odds ratios for each of these comparisons remain significant even after controlling for core differences across the ED use groups (OR = 1.67 for occasional users, $P < 0.001$; and OR = 2.38 for frequent users, $P < 0.001$).

Occasional versus Frequent Users

The differences between frequent and occasional ED users are also statistically significant at the 0.05 level in almost all cases, as indicated in the last columns of Tables 1 and 2. In general, factors that are associated with higher ED use have stronger effects on being a frequent user than on being an occasional user. For example, relative to whites, blacks have higher odds of being frequent ED users as opposed to occasional users. Similarly, relative to U.S.-born citizens, foreign-born noncitizens have higher odds of being a frequent ED user as compared with being an occasional user. The exceptions to this pattern are the insignificant effects of being married without children or having private health insurance, and the smaller effect of having a bachelor's degree or higher.

DISCUSSION

Previous research on the relationship between patient characteristics and ED use levels are mostly hospital-based studies that cannot contrast between ED users and nonusers. However, these studies can contrast occasional and frequent ED users and, using a nationally representative sample, we confirm some of their findings; frequent ED users are more likely to be black and poor than occasional users. Contrary to conventional wisdom, our analysis does not show that adults who frequently use EDs for health care are more likely to be uninsured or lack access to other healthcare providers than people who do not use the ED within 1 year. Instead, frequent ED users are more likely to be publicly insured, to report health problems, and to have had more than 2 ambulatory care visits outside of the ED. Frequent users do not appear to substitute primary care for ED visits as some hospital-based studies suggested,[13–15] they simply use more care of all types than those who do not use the ED and are still more likely to report having unmet medical need. Taken together, our results echo a recent hospital-based study's finding that frequent ED users are a sicker and probably more chronically ill population.[12] Our results also indicate that frequent ED users are different not just from non-ED users but from occasional ED users as well, indicating that analyses that treat all ED users the same, like previous population-based studies have done,[18–21] could be misleading.

This study has several potential methodologic limitations. First, although access to care can influence the amount of ED visits, the causality can go the other way; ED use might influence the amount of care received in other outpatient settings. This reverse causality can result in biased estimates of the odds ratios.[28,30] Second, recall errors by the respondents could have resulted in some underreporting or truncation of the number of ED visits, but this should have been attenuated by basing our study on the classification of adults into the 3 ED use levels. Third, the managed care indicator is also measured with error; therefore, we were not able to obtain precise estimates on the effect of managed care on ED use. Finally, we do not have detailed information on the reasons for the ED visits or on specific chronic conditions and both characteristics are potentially important determinants of frequent ED use.

Although there are problems associated with being uninsured (such as inadequate access to health care and worse health outcomes), our findings suggest that the uninsured population was not the main source of ED overcrowding. Privately insured adults constitute the majority of all adults, and as such, the majority of frequent ED users and two thirds of occasional users. Moreover, the privately insured and uninsured who use the ED frequently both have approximately 5 ED visits annually. The result is not too surprising considering that both the privately insured and the uninsured face financial disincentives to visit the ED. Even if many uninsured patients end up not paying for ED care, most still receive a bill and perhaps are hassled by a collection agency. The privately insured could also be responsible for their own bills if the insurer does not view the ED care as medically necessary.

However, the distribution of ED visits tends to suggest another potential problem. Although only approximately 5% of adults are publicly insured, they represent 9% of occasional users and 29% of frequent users. The overrepresentation of the publicly insured among ED users could reflect access problems that have persisted within this population.[31] In addition, ED care would be free for Medicaid patients because they do not generally face copayments.

Given that frequent ED users are also high-end users of other healthcare resources, it could be that some form of case management for chronic diseases could be a successful mechanism for reducing their ED use. Medicaid programs have

moved toward disease management for their beneficiaries, in part, as a way for providing a "medical home" and reducing unnecessary ED use.[32,33] However, people with greater healthcare needs could still end up in EDs as a way of getting access to specialty care, which might not be readily available in other settings or which could have been constrained by managed care.[7,34]

This study suggests that problems of overcrowding and inappropriate use for nonurgent needs would not be solved by policies that just target the ED itself. An effective policy would need to examine broader access issues in other healthcare settings and to evaluate the healthcare needs of certain populations. As policymakers explore strategies to relieve the burden on EDs, they need to understand why publicly insured adults and those in poor health turn to this setting as a frequent source of care. The challenge will be to redirect these patients toward other provides at a time when EMTALA requires EDs to examine and treat anyone who walks in and access to other care is less than ideal.

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