

Characteristics of Frequent Emergency Department Users

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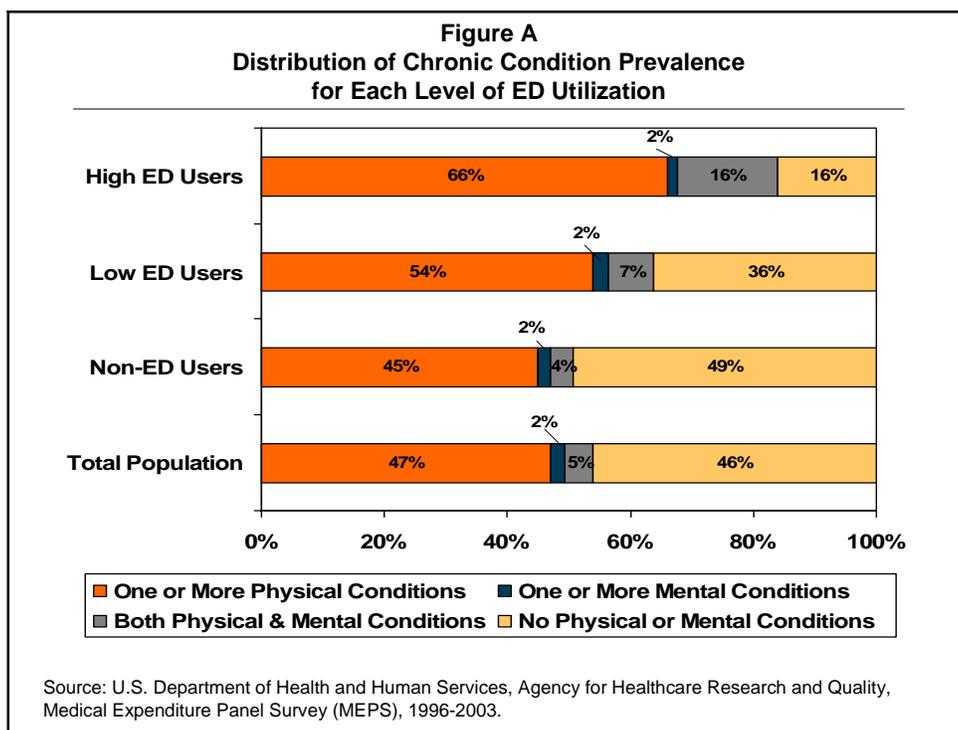
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Executive Summary:

Increased utilization of US hospital emergency departments (EDs) has received considerable attention from both the health care and policymaking communities in recent years. The following analysis uses data from the Medical Expenditures Panel Survey (MEPS) in order to examine the demographic and health characteristics of people who frequently use hospital EDs and how the risk of being a High ED User varies based on these characteristics.

This analysis finds that persons who frequently use hospital EDs (defined as four or more visits over two years) are those with anticipated higher needs for health care services – specifically, the elderly, the poor, and persons living with chronic conditions, all of whom are more likely to be in poor health. Our analysis finds that 84% of High ED Users live with chronic conditions (Figure A) and that 31% of High ED Users' ED visits are related to chronic conditions compared to 16% for Low ED Users. Furthermore, High ED Users are not obtaining medical services exclusively at the ED but also utilize outpatient services at a greater rate than Low ED Users, with 86% of High ED Users having 4 or more outpatient visits compared to 72% for Low ED Users. In addition, our examination of ED utilization by insurance coverage reveals that the uninsured are not more likely to frequently visit the ED than those who have insurance. The uninsured, while making up roughly 15% of the sample population, are responsible for about 14% of total ED visits and about 12% of aggregate ED expenditures.



Our MEPS-based findings add to a growing body of research based on large national surveys that suggest that persons who frequently utilize ED services may not be using the ED as a “substitute” for primary care, but rather appear to be living with chronic conditions and in need of more health care services overall.

Introduction and Policy Context:

Considerable attention has been given in recent years to increased pressure on US hospital emergency departments (EDs) in the face of increased utilization and depleted local and national resources. Increased pressure on the nation's EDs has important system-wide implications for policymakers, including negative effects on patient quality of care, reductions in system-wide capacity to handle emergencies, and increases in overall health care costs resulting from the inefficient use of emergency facilities for non-emergencies. This analysis uses data from the Medical Expenditures Panel Survey (MEPS) to examine both the demographic characteristics of ED Users and the characteristics that put an individual at risk of being a High ED User.

Data Source and Definition of Key Terms:

The data source for this analysis is the Medical Expenditures Panel Survey (MEPS). MEPS is a nationally representative survey of the US noninstitutionalized population. Using an overlapping panel design, the data are collected from panels of sample households over two years. For this analysis, we merged seven panels of MEPS data, covering the years from 1996 to 2003. This analysis defines High ED Users as individuals of all ages (including children, working-age adults, and the elderly) who visited the ED four or more times during the two-year panel period and Low ED Users as those who visited the ED between one and three times during that same time period.

The analysis begins by first comparing High and Low ED Users across several demographic, insurance, and health characteristic categories. We then proceed by examining who is at risk of high ED utilization among the same demographic categories and across insurance coverage categories. Health insurance designations, including Medicare, Medicaid, privately insured, and uninsured, were assigned to each ED user based on the type of coverage an individual had for at least 13 of the 24 months studied. A fifth category, labeled "mixed," was assigned to individuals with any other combination of insured and uninsured months.

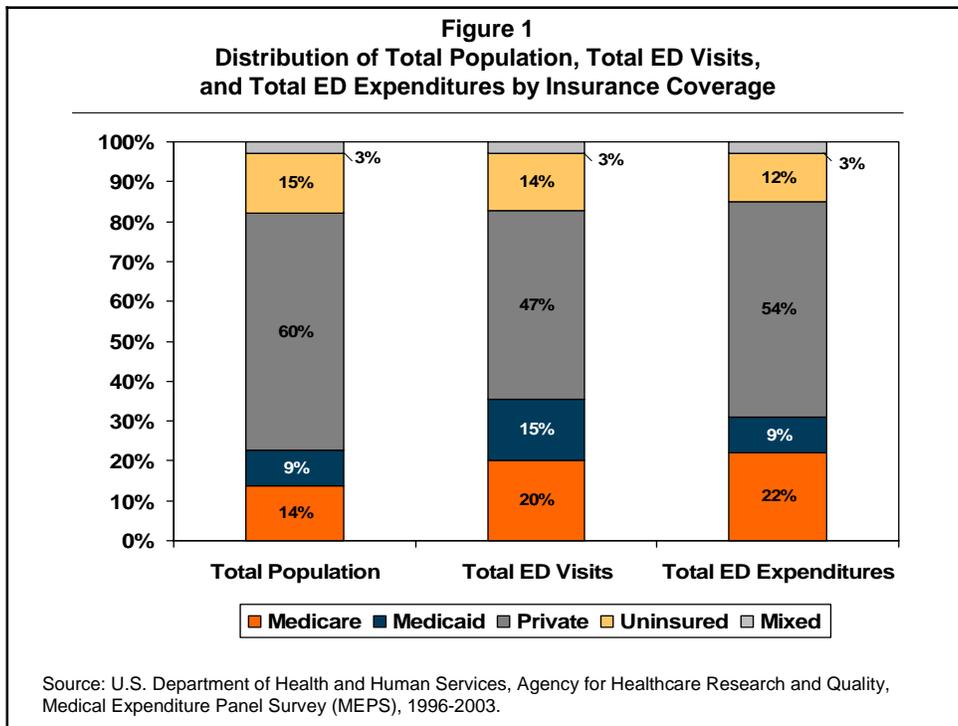
Health status designations are developed using each respondent's rating of Perceived Health Status (PHS) and Perceived Mental Health Status (PMHS) as either Excellent, Very Good, Good, Fair or Poor. Because MEPS collects PHS and PMHS several times during the two-year panel, this analysis uses the earliest-reported values to measure perceived health status. Individual responses are coded into two status groups based on the following criteria: if both PHS and PMHS are reported as Excellent, Very Good or Good, the individual is categorized into the Excellent/Very Good/Good group and if either value is rated as Fair or Poor, the individual is grouped as Fair/Poor. See the Methods Appendix for more information on methodology and definitions.

Results

Overall, High ED Users make up a very small portion of the population studied – roughly 1%. By comparison, Low ED Users comprise 21% of the total population and the remaining 78% are

Non-ED Users. While High ED Users comprise only 1% of the overall study population, they are responsible for almost 18% of total ED visits and roughly 16% of all ED-related expenditures.

By health insurance coverage, the distribution of the population varies from the distributions of ED visits and ED spending (Figure 1). For example, although Medicare covers 14% of the population, Medicare beneficiaries account for 20% of total ED visits and 22% of ED spending. Medicaid beneficiaries comprise 9% of the population, and like Medicare beneficiaries, account for a higher percentage of total ED visits (15%). Unlike Medicare beneficiaries, individuals with Medicaid account for spending that is in line with the population distribution – 9%. And, of note is that the uninsured, while making up roughly 15% of the population, are responsible for about 14% of total ED visits and less than 12% of aggregate ED expenditures.

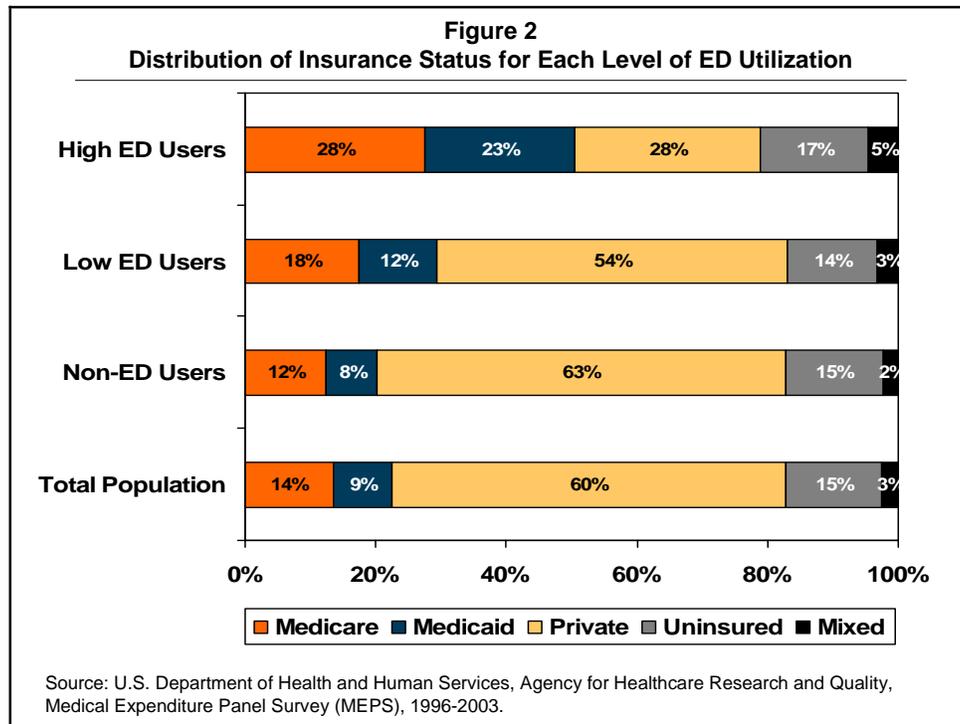


Characteristics of High and Low ED Users

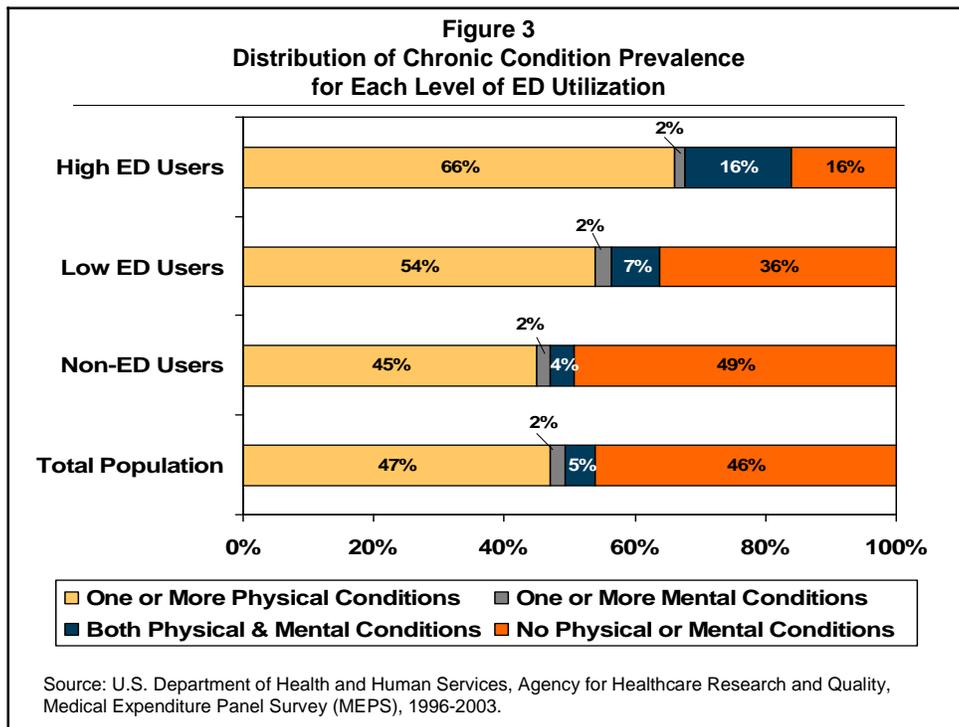
The following is a brief description of the proportional make up of High and Low and ED Users across several characteristic categories:

- **Health Insurance** –As Figure 2 demonstrates, High ED Users are far more likely to have Medicare (28%) or Medicaid (23%) coverage than Low ED Users (18%, 12%) and Non-ED Users (12%, 8%). In contrast, a majority of both Low ED Users (54%) and Non-ED Users (63%) have private health insurance coverage. In addition, there is little variation across ED use groups in terms of the proportion without insurance, with 14% of Low ED Users, 15% of Non-ED Users and 17% of High ED Users lacking insurance.

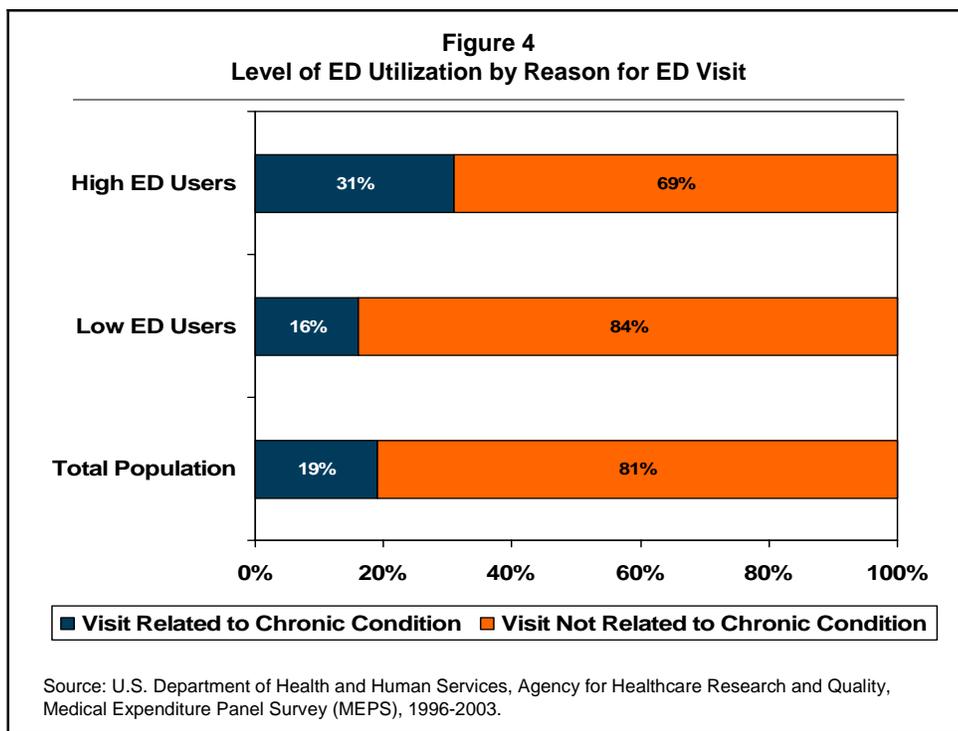
Because Medicare and Medicaid are the public insurance programs responsible for providing health insurance to the elderly, disabled, and poor, one might expect these programs to cover a relatively high proportion of High ED Users. For example, 36% of Medicare enrollees live with three or more chronic conditions¹ and 14% of Medicaid enrollees are disabled.² Overall, these data show that about 31% of individuals on Medicare and 19% of individuals on Medicaid report their perceived physical or mental health status as fair or poor compared to 7% of individuals with private coverage. When looking at service use by insurance coverage, the differences in health status between the populations with different types of insurance influence the service use patterns.



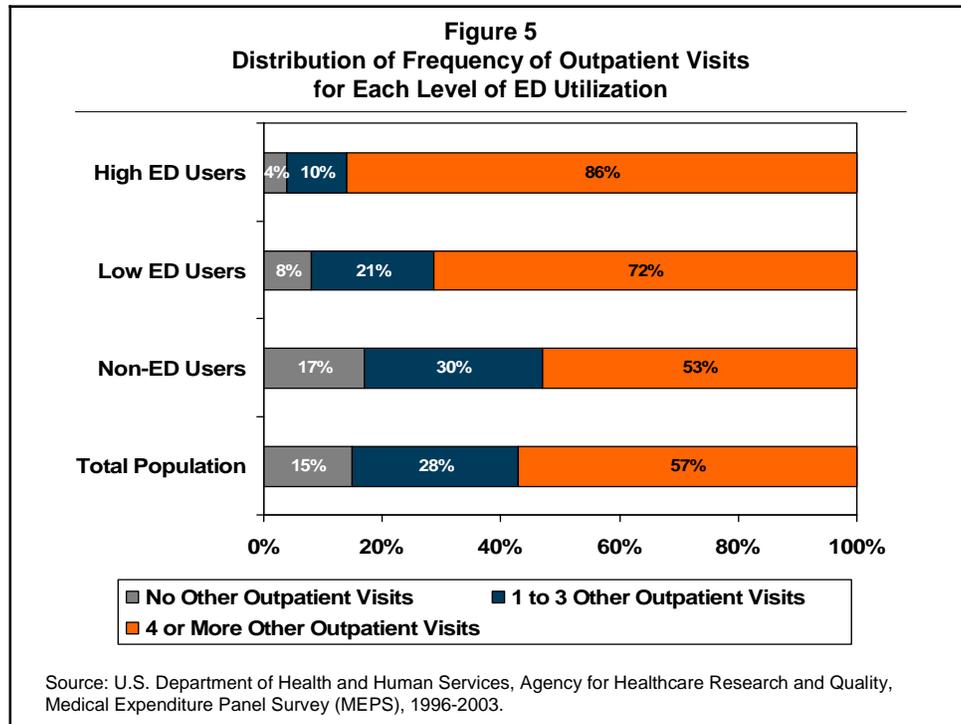
- Chronic Conditions** – In order to examine the relationship between chronic medical conditions and rates of ED utilization, the analysis partitions the MEPS panel population into four chronic condition categories – persons with one or more physical chronic conditions; persons with one or more mental chronic conditions; persons with both physical and mental chronic conditions; and persons with neither physical nor mental chronic conditions. The prevalence of self-reported chronic conditions is high—over half of the total population reports having at least one chronic condition (54%). As depicted in Figure 3, High ED Users are the group most likely to be living with at least one physical chronic condition. About 84% of those considered High ED Users have at least one chronic condition, compared to 64% of Low ED Users.



- Reason for ED Visit* – In addition to the previous discussion of ED utilization for individuals with chronic conditions, ED visits were counted and analyzed to determine the proportion of total ED visits related to chronic conditions. Overall, nearly one in five ED visits (19%) are related to a chronic condition and the number increases to nearly a third for High ED Users (31%). Figure 4 shows that among the population studied, the proportion of ED visits related to a chronic condition is almost twice as high among High ED Users (31%) as that for Low ED Users (16%). Among the uninsured, 32% of visits made by High ED Users were related to chronic conditions compared to 15% of visits made by Low ED Users, the biggest difference by insurance status between the proportion of visits related to chronic conditions between High ED Users and Low ED Users.

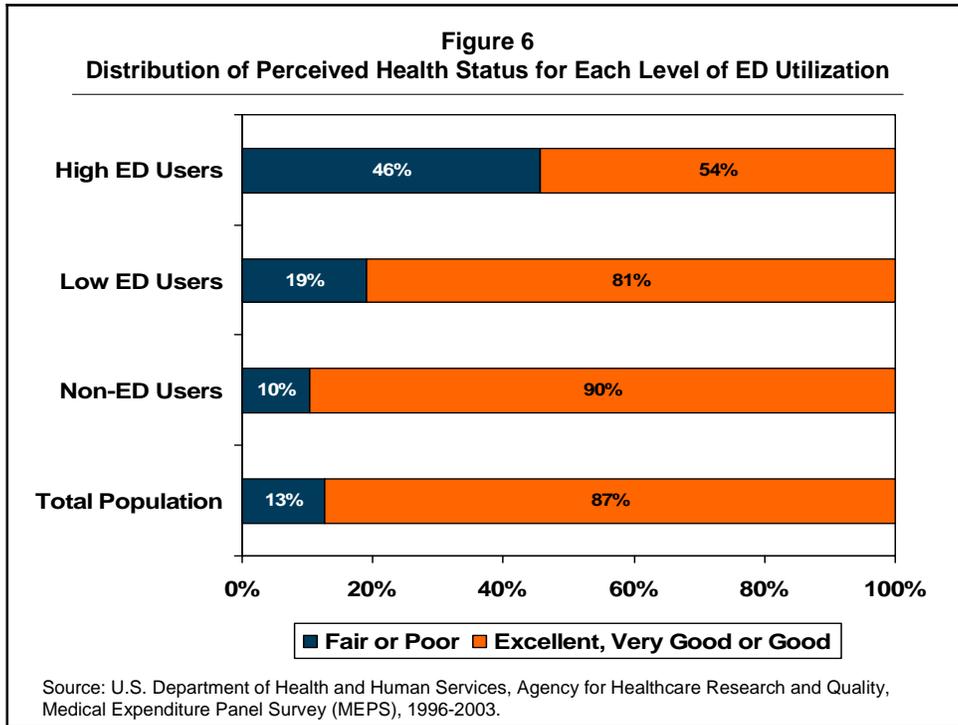


- Use of Other Types of Outpatient Visits* – In order to examine the relationship between ED utilization rates and the utilization rates for other types of outpatient services, individuals were grouped into one of three categories, depending upon their frequency of other outpatient visits during each two-year panel – no other visits, one to three other visits, and four or more other visits. Figure 5 demonstrates that High ED Users are far more likely than Low and Non-ED Users to be frequent health services users in general, with 86% utilizing non-emergency outpatient care four or more times during the two year study period, compared to 72% for Low Users and 53% for Non-Users.

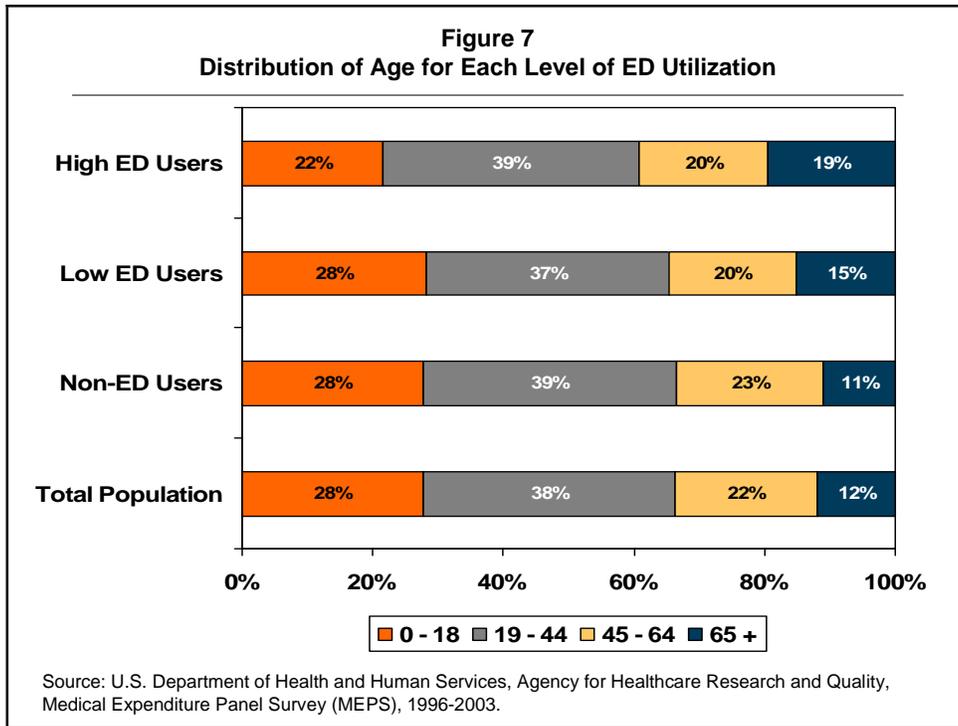


Consistent with the fact that the uninsured receive fewer services,³ the uninsured are less likely than those with insurance coverage to have at least one outpatient visit. About 15% of uninsured High ED Users have had no outpatient visits, a larger proportion than the High ED Users with insurance (see Appendix Figure 1). However, as with the insured, a high proportion of uninsured High ED Users have had 4 or more outpatient visits. Among the uninsured, the percentage with 4 or more visits increases substantially from 28% for non-ED Users, to 46% of Low ED Users, and finally, to 68% of High ED Users. While the uninsured do not use outpatient visits with the same frequency as individuals with insurance, the pattern of service use is similar. As the level of ED use increases, the level of outpatient service use also increases. These findings indicate that the uninsured are not relying exclusively on the ED to obtain services but also seek outpatient services.

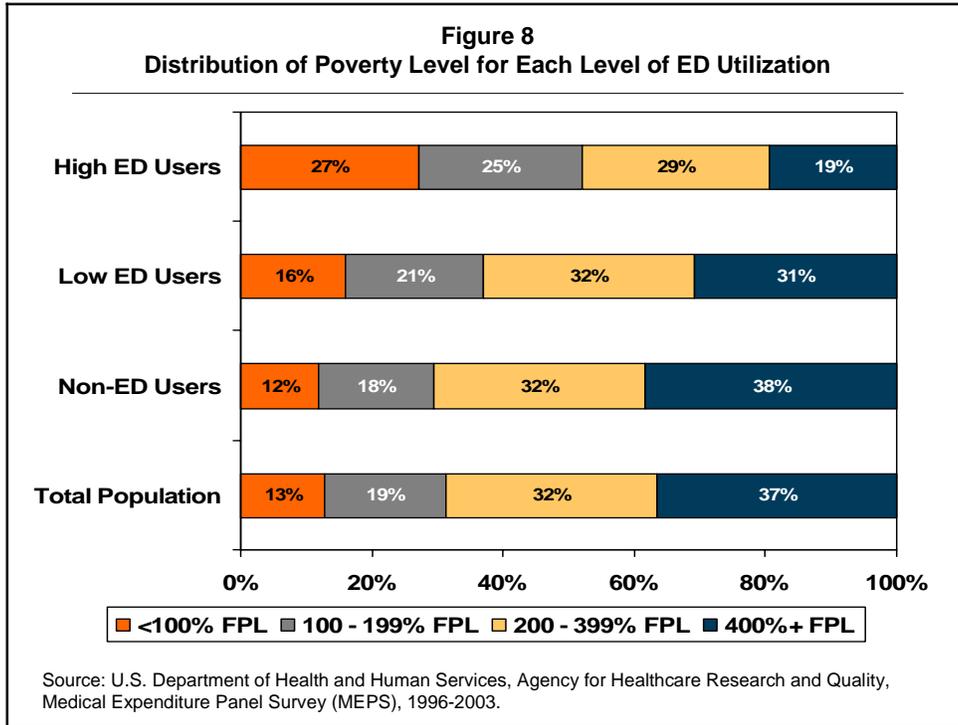
- *Perceived Health Status* – High ED Users are much more likely than Low and Non-ED Users to report being in fair or poor physical or mental health. Almost half (46%) of High ED Users reported being in Fair/Poor health compared to 19% and 10% of Low and Non-ED Users, respectively (Figure 6).



- *Age Group* – Not surprisingly, High ED Users tend to have a larger proportion of elderly individuals and a smaller proportion of children than other groups (Figure 7). Interestingly, there is little variation across the ED User groups in the proportion who are working-age adults.



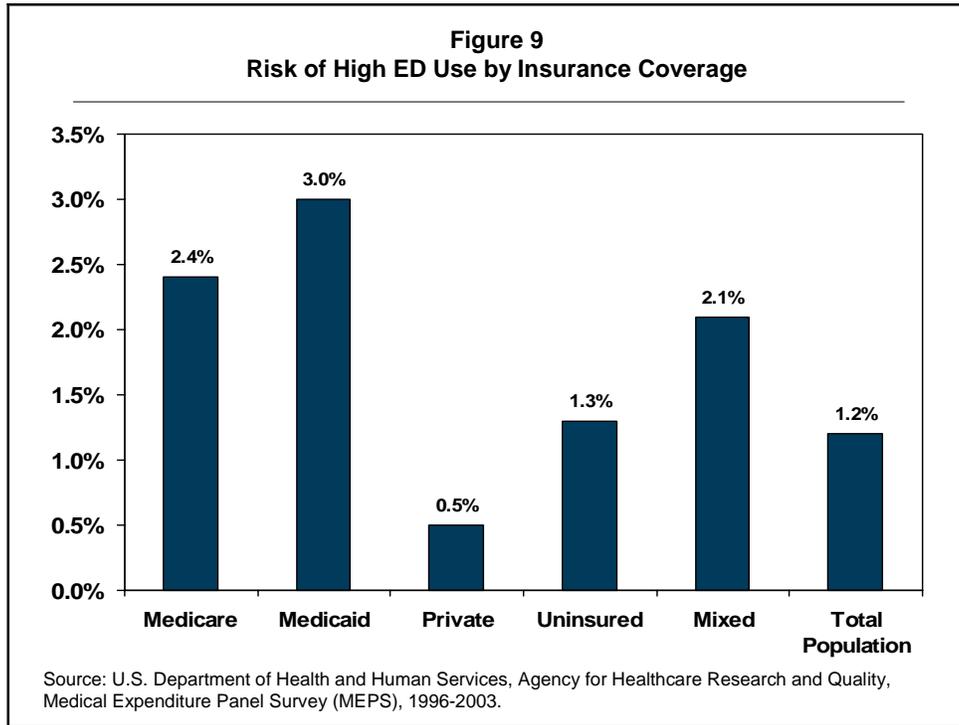
- Poverty Level** – The relationship between ED utilization and relative poverty was examined by stratifying the population according to the Federal Poverty Level (FPL). Four income categories were designated as follows: less than 100% FPL, 100% to 199% FPL, 200% to 399% FPL, and 400% FPL or greater. Figure 8 demonstrates that compared to Low ED Users and Non-ED Users, High ED Users are far more likely to be poor and near-poor and far less likely to be of the highest income group.



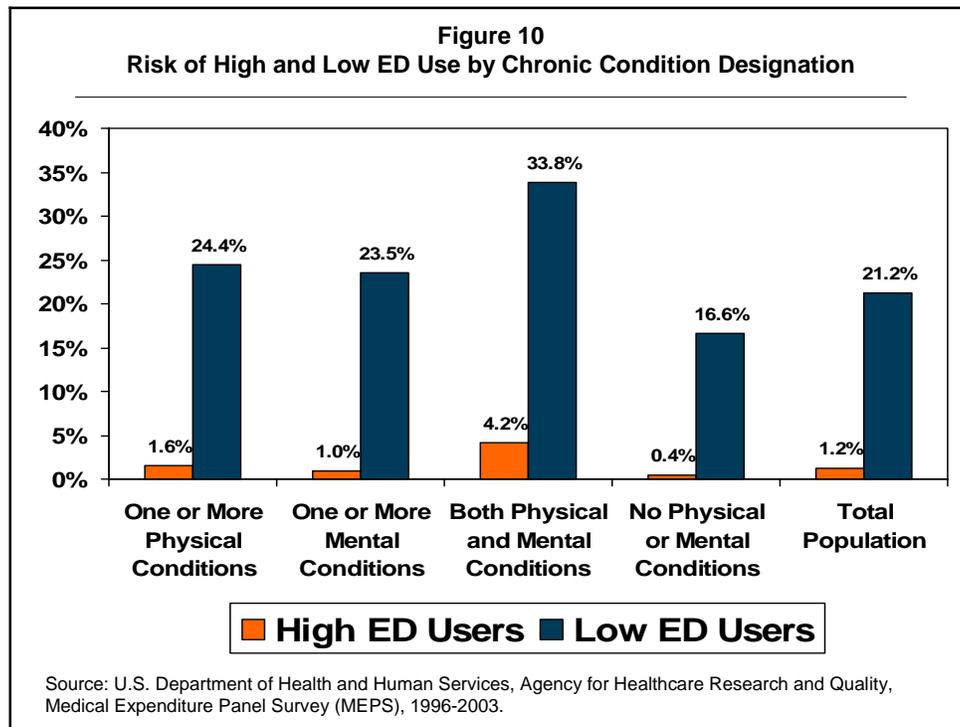
Risk of High ED Utilization

The risk or the likelihood that an individual is a High ED User varies significantly by demographic and health status and by health insurance coverage. In the sections that follow, we highlight the characteristics that increase the chances that a person will visit the ED frequently. Generally, individuals with public insurance, chronic conditions, poor perceived health status, and lower incomes are at increased risk of being High ED Users.

- *Health Insurance* – Individuals in the study sample with public insurance – Medicare or Medicaid – are far more likely to be High ED Users than those with either private, mixed or no insurance coverage. Figure 9 demonstrates that Medicare and Medicaid beneficiaries are the most likely of the insurance coverage designations to be High ED Users (2.4% and 3.0%, respectively) while those with private coverage are the least likely (0.5%). The uninsured, which make up less than 15% of the study population, are about as likely (1.3%) as the population average (1.2%) to be High ED Users.



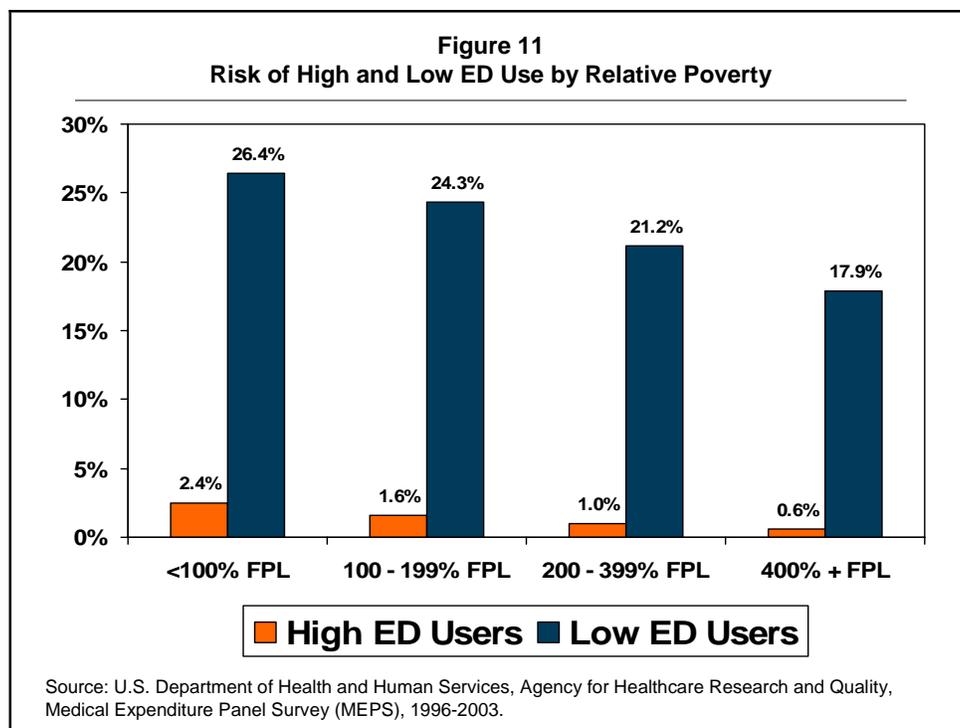
- Chronic Conditions* – As demonstrated in Figure 10, individuals reporting one or more physical chronic conditions are more likely to use the ED and are more likely to be High ED Users than individuals not reporting any chronic conditions – 1.6% vs. 0.4%. In addition, the small number of individuals that reported both physical and mental chronic conditions are the most likely to be High ED Users (4.2%). Across chronic condition categories, the proportion of High ED Users with Medicaid coverage is consistently higher than for all other insurance groups.



- Perceived Health Status* – In general, individuals reporting either PHS or PMHS as either Fair or Poor are much more likely to be High ED Users than the reportedly healthier group – 4.2% vs. 0.7%. For both of the perceived health status designations, there is a fairly consistent pattern of ED use across insurance coverage designations – a higher than average proportion of Medicare and Medicaid beneficiaries are High ED Users, the proportion of the uninsured that are High ED Users is fairly close to the average, and the proportion of those with private insurance coverage is consistently below average.
- Use of Other Types of Outpatient Visits* – The data indicate that individuals with frequent outpatient visits are also more likely to be High ED Users (1.8%) than those with fewer and no outpatient visits (0.4% and 0.3%).
- Age Group* – As expected, as individuals get older, the risk of High ED Use increases slightly. Less than 1% (0.9%) of children ages 0 to 18 are High ED Users compared to 1.9% of individuals 65 or older.

When considering ED use frequency across both age and insurance type, the pattern of high ED use remains fairly consistent: across age groups, Medicare and Medicaid beneficiaries are High ED Users at rates higher than age group average, those with private insurance lower than age group average, and the uninsured at about age group average. The higher than average rates of High ED Users among Medicare beneficiaries in the 19 to 44 and 45 to 64 age groups are expected given that these individuals likely have Medicare coverage due to disability.

- *Percent of Poverty Level* – The relationship between ED utilization and relative poverty follows a consistent trend: the relative percentage of High and Low ED Users declines as income rises, with 2.4% of the poorest group designated as High ED Users compared to just 0.6% of the highest income group (Figure 11).



When considering ED use frequency across both income and insurance type, the pattern of High ED User percentage is relatively consistent – Medicare and Medicaid populations have higher rates of High ED Use than the income group average and those with private coverage consistently have the lowest proportions of High ED Users.

Discussion

The purpose of this study was to determine who is most likely to use the emergency department frequently. Persons who frequently used hospital EDs (four or more times over the course of two years, referred to here as High ED Users) were those with greater health care needs –

specifically, the elderly, the poor, those with Medicare and Medicaid who are more likely to be disabled, and those living with chronic conditions. High ED Users tend to be frequent users of medical services in general, with a significantly higher proportion of this group (86%) reporting four or more non-ED outpatient visits during the two year study period than Low and Non-ED Users (72% and 53%). This suggests that, contrary to common thought, High ED Users may not be using the ED as a “substitute” for primary care, but rather their need for health services simply may be greater.

Comparing ED visits across different health insurance groups, we also found that the uninsured are not more likely to frequently use the ED than others. To the contrary, the data reveals a consistently different pattern of ED use. Medicare and Medicaid beneficiaries are typically High ED Users at rates exceeding the group average, the privately insured are consistently below average, while the share of the uninsured who are High ED Users is near the overall average. The uninsured, while making up roughly 15% of the sample population, account for about 14% of total ED visits and less than 12% of aggregate ED expenditures.

Our analysis of high ED utilization reinforces previous research on this subject. Specifically, Zuckerman and Shen’s 2004 analysis of the 1997 and 1999 National Surveys of American Families estimated the effect of various demographic and insurance characteristics on levels of ED use. Their analysis found that persons in “fair or poor” health, those with publicly funded insurance, and those who made three or more other non-ED hospital visits were far more likely to be High ED Users than their counterparts.⁴

In addition, our findings support two analyses of the nationally representative Community Tracking Study (CTS). In an examination of the 2000 to 2001 CTS, Hunt et al. assessed the likelihood that specific demographic and insurance characteristics would predict more frequent use of ED services. Similarly, they found that poor physical health, high rates of other outpatient visits, and poverty were strong predictors of high ED use. Their analysis, like ours, did not find that the uninsured were more likely to be frequent users of the ED.⁵

Taking a different approach, Cunningham (2006) examines variation in ED use across communities using the 2003 CTS. Echoing previous studies, his analysis found that communities with higher numbers of uninsured individuals do not necessarily have higher rates of ED use and that stronger predictors of ED use are community poverty levels and prevailing rates of chronic conditions. Interestingly, Cunningham finds that communities with higher levels of ED use exhibited signs of constrained outpatient capacity, providing an additional community-based explanation for variation in ED visit frequency.⁶

As policymakers and the health care community consider the impact of increased ED utilization, it is important to understand who is using the ED and what drives the demand for ED care. We find that individuals using the ED frequently are less healthy and consequently may have greater health care needs. In addition, the findings do more to dispel the notion that the uninsured are more likely to use the ED than those who have health insurance.

METHODS APPENDIX

Seven panels of data were available for use, covering years from 1996 to 2003. In aggregating data over multiple panels, population counts and aggregate expenditures were totaled, while per capita expenditures were averaged.

Definitions

Health Insurance Status

A single type of health insurance was identified for each ED user. Because insurance coverage in MEPS-HC is reported for each of the 24 months and for each month in the panel an individual can report having more than one type of insurance coverage (e.g. Medicare as well as Medicaid), we determined hierarchical categories according to the following criteria:

Medicare: an individual has 13 or more months of coverage that is coded Medicare (e.g. MCRJA99X – MCRDE00X).

Medicaid: an individual not coded as Medicare who has 13 or more months of coverage that is coded Medicaid (e.g. MCDJA99X – MCDDE00X).

Private: an individual not coded as Medicare or Medicaid who has 13 or more months of coverage that is coded Empl Union, Private-source unknown, Nongroup, Other group, Self employed, or Private (e.g. PEGJA99-PEGDE00, PDKJA99-PDKDE00, PNGJA99-PNGDE00, POGJA99-POGDE00, PRSJA99-PRSDE00, PRIJA99-PRIDE00).

Uninsured: an individual not coded as Medicare, Medicaid, or Private who has 13 or more months without any insurance coverage (look at all monthly variables, not just the ones listed above for Medicare, Medicaid, and Private).

Mixed: any other combination of insured and uninsured months.

Age Group

ED Users are consolidated into four age groups:

0-18 years
19-44 years
45-64 years
65 and older

Percent of Poverty Level

Poverty was stratified using the MEPS POVCA_{Txx} variable for each applicable panel of data, which identifies five levels of relative poverty. For this analysis the Near Poor (100%-124%) and Low Income (125%-199%) have been grouped together in a single category.

<100%	Negative and Poor
100%-199%	Near Poor and Low Income
200%-399%	Middle Income
400%+	High Income

Perceived Health Status

MEPS collects each respondent's rating of Perceived Health Status (PHS) and Perceived Mental Health Status (PMHS) for each individual in the family at several points during the 24-month survey period. Respondents rate PHS and PMHS as Excellent, Very Good, Good, Fair, or Poor.

We combined both PHS and PMHS into a single Perceived Health Status rating with one of two values: Excellent/Very Good/Good or Fair/Poor. This rating considers the earliest-reported PHS and PMHS values for each individual. If both PHS and PMHS are coded as Excellent, Very Good, or Good, the ED User is grouped into the Excellent/Very Good/Good category. If either PHS or PMHS value is Fair or Poor, the ED User is grouped into the Fair/Poor category.

Chronic Condition

The MEPS Medical Conditions file identifies the 3-digit ICD9 condition codes for medical conditions reported by survey respondents in the ICD9CODEX variable. Matching this file to the FY consolidated person-level files yields a list of medical conditions for each individual in the panel. MEPS, however, does not categorize these conditions as either chronic or not chronic. In order to identify respondents with chronic conditions, we used a file obtained from Wenke Hwang at the Johns Hopkins Bloomberg School of Public Health. This file categorizes ICD-9 codes according to two yes/no variables: (1) whether the internists surveyed considered this a chronic condition, and (2) whether the pediatricians surveyed considered this a chronic condition. Respondents were considered to have a chronic condition, if at least one of their reported ICD-9 codes were considered chronic by either internists or pediatricians.

We further distinguish between chronic conditions that are physical and mental. Because it is possible for a respondent to have more than one chronic conditions, we categorize them as Only Physical, Only Mental, or Both Types. The ICD-9 codes are again used to define these categories. Mental conditions are defined as those indicating ICD9CODX values from 290 through 319 (Mental Disorders, Drug, Alcohol)⁷ as well as V40 (Mental/Behavioral Prob).

Reason for ED Visit

The MEPS Emergency Room Visits (EROM) file contains three variables that indicate the respondent's reason for visiting the emergency department. These variables use 3-digit ICD-9 codes, so they can be identified as chronic by using the Hwang file. An ED visit is classified as related to a chronic condition if any of the three ED visit reasons matches any of the chronic conditions.

**Appendix Figure 1: Distribution of Frequency of Outpatient Visits
for Each Level of ED Utilization by Insurance Status**

	4 or More Outpatient Visits	1 to 3 Outpatient Visits	No Outpatient Visits
Medicare			
High ED Users	97%	2%	1%
Low ED Users	93	6	1
Non-ED Users	82	12	5
Total	86	10	4
Medicaid			
High ED Users	84%	14%	1%
Low ED Users	68	25	7
Non-ED Users	46	37	17
Total	53	33	14
Private			
High ED Users	89%	8%	3%
Low ED Users	73	21	6
Non-ED Users	54	31	14
Total	58	29	13
Uninsured			
High ED Users	68%	17%	15%
Low ED Users	46	33	21
Non-ED Users	28	32	40
Total	32	32	36
Mixed			
High ED Users	73%	21%	6%
Low ED Users	65	27	8
Non-ED Users	48	34	18
Total	53	32	15
Total			
High ED Users	86%	10%	4%
Low ED Users	72	21	8
Non-ED Users	53	30	17
Total	57	28	15
Source: U.S. Department of Health and Human Services, Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey (MEPS), 1996-2003.			

¹ Kaiser Family Foundation, *Medicare: A Primer*, March 2007.

² Kaiser Family Foundation, Kaiser Commission on Medicaid and the Uninsured, *The Medicaid Program at a Glance*, March 2007.

³ Jack Hadley, "Insurance Coverage, Medical Care Use, and Short-term Health Changes Following an Unintentional Injury or the Onset of a Chronic Condition," *The Journal of the American Medical Association* 297 No. 10 (2007): 1073.

⁴ Zuckerman, Stephen and Yu-Chu Shen. 2004. Characteristics of Occasional and Frequent Emergency Department Users: Do Insurance Coverage and Access to Care Matter? *Medical Care* 42(2): 176 – 182.

⁵ Hunt, Kelly A., Ellen J. Weber, Jonathan A. Showstack, David C. Colby, and Michael L. Callahan. 2006. Characteristics of Frequent Users of Emergency Departments. *Annals of Emergency Medicine* 48 (1): 1 – 8.

⁶ Cunningham, Peter J. 2006. What Accounts For Differences in The Use of Hospital Emergency Departments Across U.S. Communities? *Health Affairs* 25(5): 324 – 336.

⁷ The use of ICD-9 codes 290 through 319 to identify mental conditions was also used in a study by Kyle L. Grazier and William G'Sell, "Group Medical Insurance Claims Database Collection and Analysis," Society of Actuaries, September 2004, p. 50.



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