

# Out-of-Hospital and Emergency Department Utilization by Adult Homeless Patients

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**Study objective:** Homeless adults visit emergency departments (EDs) nearly 4 times more often than the general population and are among the highest repeat visitors. Little research, however, has determined resource utilization patterns of homeless patients and the extent to which they may benefit from emergency care. The objectives of this study are to describe emergency medical services and hospital utilization by homeless patients and to estimate their benefit of ED care.

**Methods:** This was a retrospective cohort study performed at an urban safety-net hospital. All patients who presented to the ED during 2003 were identified. Simple random samples of 300 homeless adult patients and 300 nonhomeless adult patients were identified and included as the study sample. Variables collected included patient demographics, medical history, ED visit date and times, results of laboratory studies, disposition from the ED, diagnoses, ambulance use, number of previous ED visits, and estimated benefit of emergency treatment as determined by a previously developed consensus-based instrument.

**Results:** Homeless patients were slightly older (41 years [interquartile range (IQR) 34 to 48 years] versus 36 years [IQR 25 to 46 years]) and had substantially higher substance abuse histories but had similar medical and psychiatric comorbidities compared with nonhomeless patients. Homeless patients also spent more time in the ED per visit (4.4 hours [IQR 2.6 to 7.5 hours] versus 3.8 hours [IQR 2.1 to 5.7 hours]), were less likely to be admitted to the hospital (8% versus 19%), and were more likely to use ambulance services (51% versus 29%). Finally, homeless patients received a similar level of estimated benefit of emergency treatment compared with nonhomeless patients, and a substantial proportion of their visits was directly related to excessive alcohol use.

**Conclusion:** Homeless adults commonly use emergency care resources, and medical benefit, although comparable to that of nonhomeless adults, is in many cases uncertain. [Ann Emerg Med. 2007;50:646-652.]

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## INTRODUCTION

### Background

Currently, as many as 3.5 million people are homeless in the United States, and this number has tripled during the last decade.<sup>1-3</sup> With an overall prevalence of approximately 1%, homeless adults visit emergency departments (EDs) nearly 4 times more often than the general population and are among the highest repeat visitors to the ED.<sup>4,5</sup> In addition, homeless adults have higher levels of overall health care use, including admissions to the hospital, prolonged hospital stays, and the incurrence of significantly higher health care costs compared

with the general population.<sup>6,7</sup> This has the potential to have a substantial impact on health care systems, especially emergency medical services (EMS).

### Importance

Little research has been performed to determine resource utilization patterns of homeless patients and whether they, in general, benefit from emergency medical care. Homeless patients commonly use EDs partly because of their lack of health insurance, limited access to routine primary care, and increased prevalence of illness associated with poverty

### Editor's Capsule Summary

#### *What is already known on this topic*

Homelessness is a major social and public health problem in the United States.

#### *What question this study addressed*

Do homeless patients utilize emergency medical services (EMS) and emergency department (ED) care for different reasons than nonhomeless patients?

#### *What this study adds to our knowledge*

Compared with a matched cohort of 300 nonhomeless controls, 300 homeless patients had similar medical and psychiatric comorbidities but a much higher rate of ED visits associated with excessive alcohol use. They were also more likely to use EMS to reach the ED, regardless of illness severity.

#### *How this might change clinical practice*

Alternative methods for addressing the health care needs of the homeless such as establishing medical homes for primary care and providing effective treatments for alcoholism might improve patient care while reducing emergency service utilization.

(eg, tuberculosis, HIV, and malnutrition).<sup>8</sup> With the overall increasing number of ED visits annually in the United States, additional research is needed to assess the extent to which homeless adults use EMS and how it varies with respect to use by the general population.

### Goals of This Investigation

The primary objectives of this study were to demonstrate (1) demographic differences between homeless and nonhomeless patients who visited the ED; (2) EMS and hospital utilization differences among homeless and nonhomeless patients; and (3) differences in estimated benefit of emergency treatment between homeless and nonhomeless patients by using a previously derived tool to estimate benefit of emergency medical care. Secondary objectives of this study included comparisons of medical and social histories and seasonal ED utilization between the 2 groups.

### MATERIALS AND METHODS

This study was approved by the Colorado Multiple Institutional Review Board and was granted a waiver of informed consent. No internal or external funding sources were available for this study.

#### Study Design and Setting

This was a retrospective cohort study performed at Denver Health Medical Center in Denver, CO. Denver County spans approximately 150 square miles, and in 2003 its estimated

population was 556,000.<sup>9</sup> Also, approximately 51% of residents are male, 65% are white, 32% are Hispanic, 11% are black, and 3% are Asian.<sup>9</sup>

Denver Health Medical Center is considered an urban safety-net hospital and Level I trauma center for Denver and Denver County. Denver Health is a nationally recognized integrated health care system that provides care for the uninsured, underinsured, and vulnerable populations in Denver County.<sup>10</sup> This system consists of Denver Health Medical Center, 9 community health centers, 12 school-based clinics, a detoxification and substance abuse treatment center, and a correctional care facility. In addition, Denver Health is the base hospital and provides primary medical direction for the Denver Health Paramedic Division, which responds to nearly all calls for medical assistance in Denver County. In addition to Denver Health Medical Center, Denver County has 9 adult-receiving, acute care medical centers. The ED at Denver Health Medical Center has an approximate annual census of 65,000 patients, of which approximately two thirds arrive by personal means and approximately one third arrive by ambulance. Public transportation within Denver is achievable through the Regional Transportation District, a public agency providing mass transportation to Denver and Denver County by bus and train.

### Selection of Participants

All adult patients (age  $\geq 18$  years) who presented to the ED between January 1, 2003, and December 31, 2003, were identified. Those patients who did not have an address of residency or who could not provide an address of temporary residency at triage were categorized prospectively as being homeless by ED registration personnel. For the purposes of this study, residency determination (ie, homeless or nonhomeless) was identified and confirmed by evaluating the registration sheets of all ED medical records during the study period. All patients were then categorized into 2 groups, namely, those who were homeless and those who were not homeless.

Simple random sampling, using a computer-generated list of random numbers (SAS, version 9.1; SAS Institute, Inc., Cary, NC), was used to select 300 homeless and 300 nonhomeless patients from the 2 groups. This sampling procedure was performed to obtain unbiased samples from each group. Because of the descriptive nature of this study, no single hypothesis was used to generate our sample size. Instead, a sample size of 300 homeless patients was determined according to the resources required for data collection and the relative width of the binomial confidence intervals (CIs) across the range of its proportions.<sup>11</sup> A nonhomeless study sample of 300 was used to balance the 2 groups.

Patients were excluded if they were younger than 18 years, they had incomplete or inaccessible medical records that prevented identification of their homeless status, or they established a place of residency as determined by subsequent ED visits. Repeat visits by the same patient were also excluded from the study sample.

## Data Collection and Processing

All data were collected with a standardized closed-response data collection instrument. All medical records at Denver Health Medical Center are housed on an electronic medical imaging system. Data abstraction was performed by 2 non-blinded, trained investigators (D.A.P. and A.R.B.). A third investigator (J.S.H.) monitored data abstraction and was used in an arbitration process when discrepancies during data abstraction occurred. No quantitative assessment was performed to assess the accuracy of abstraction.

Variables collected included patient demographics (age, sex, and race/ethnicity), health insurance status, comorbidities (including a history of diabetes mellitus, coronary heart disease, heart failure, hypertension, pulmonary disease, stroke, seizure, liver disease, any Axis I psychiatric illness requiring therapy, alcohol and illicit drug use, and tobacco use), the ED visit date, the number of visits to the ED before the index visit (beginning on September 1, 1997), triage and discharge times, breath or serum alcohol level and urinary toxicologic screen (if performed), disposition from the ED (defined as admitted to the hospital, discharged from the ED, or transferred either to a detoxification center or to jail), ED discharge diagnoses, whether an ambulance was used for transportation to the ED and whether the transport (from the scene to the hospital) was emergency or nonemergency, and the total number of previous ED visits.

Each medical record, including the ED and hospital records (if applicable), was evaluated and assigned an estimated level of medical benefit of emergency treatment using a previously developed estimated benefit of emergency treatment instrument.<sup>12</sup> Two investigators (D.A.P. and J.S.H.) independently categorized each patient's ED visit as "significant benefit," "possible benefit," or "unlikely benefit" with this instrument. In an effort to apply the estimated benefit of emergency treatment instrument in the exact manner as originally described, the investigators applied it in groups of 100 patient visits. After each group was classified, agreement was assessed and discordant results were discussed to assign a final estimated benefit of emergency treatment classification. This process continued until all 600 patient visits were classified.

The estimated benefit of emergency treatment instrument uses whether the patient is hospitalized; whether a confirmed, probable, or possible diagnosis is made according to specific definitions; and whether the diagnosis required urgent medical treatment, defined as significant risk of morbidity or mortality or progression if left untreated for 72 hours to assign estimated benefit of emergency treatment categories. Patients who were admitted to the hospital and had a confirmed diagnosis made but did not require urgent medical treatment were classified as having had "possible benefit," whereas those who had an unconfirmed diagnosis made without requiring urgent medical treatment were classified as having received "unlikely benefit" of emergency care. Patients who were admitted to the hospital and had a confirmed or unconfirmed diagnosis that required urgent

medical treatment were classified as having received "significant benefit." For patients not hospitalized, the level of diagnosis (confirmed, probable, or possible) and the extent to which this diagnosis required urgent medical treatment or how the patient responded to treatment dictated whether the patient was classified as having received "significant," "possible," or "unlikely" benefit from emergency medical care.

## Primary Data Analysis

All data were entered into a password-protected electronic spreadsheet (Microsoft Excel; Microsoft Corporation, Redmond, WA) and transferred into native SAS format with translational software (dfPower DBMS/Copy; DataFlux Corporation, Cary, NC). All statistical analyses were performed using SAS, version 9.1 (SAS Institute, Inc.) or Stata, version 8 (Stata Corp, College Station, TX).

Descriptive statistics were performed for all variables. Continuous variables are reported as medians with interquartile ranges (IQRs) and categorical variables are reported as percentages with 95% CIs. Comparisons between the homeless and nonhomeless groups were performed using the absolute differences between median values (for continuous data) or percentages (for categorical data). Robust CIs for median differences were calculated with the CENDIF command in Stata.<sup>13</sup> Specific statistical comparisons corresponding with this study's primary objectives were defined a priori and included age, sex, race/ethnicity, health insurance coverage, characteristics of EMS and hospitalization utilization, and estimated benefit of emergency treatment. Because of the relatively large number of planned statistical comparisons, a Bonferroni adjustment was performed, requiring 99.8% CIs to achieve statistical significance. Finally, the overall raw proportion of agreement across all estimated benefit of emergency treatment classifications was calculated. The interrater agreement for the classification of estimated benefit of emergency treatment was measured with a weighted  $\kappa$  for each group of 100 patient visits, and the Spearman-Brown coefficient was calculated to assess the reliability of this overall classification process (ie, classifying 100 patient visits, assessing agreement, reviewing all discordant results and assigning them a final estimated benefit of emergency treatment classification, and then moving on to the next group of 100 patient visits until all 600 patient visits had been classified). Unless specifically stated, the unit of analysis was the patient.

## RESULTS

### Main Results

During 2003, 65,419 total ED patient visits occurred. Of these, 4,844 (7%) were categorized as homeless. Homeless patients were slightly older (41 years [IQR 34 to 48 years] versus 36 years [IQR 25 to 46 years]), more likely to be male (84% versus 58%), more likely to be white (56% versus 36%), and less likely to be Hispanic (28% versus 46%) compared with nonhomeless patients (Table 1).

**Table 1.** Demographics and insurance coverage between homeless and nonhomeless patients.

Characteristics	Homeless (n = 300), %	Nonhomeless (n = 300), %	Absolute Difference* (95% CI)
Median age, y	41 (IQR 34–48)	36 (IQR 25–46)	+5 (0 to +10)
<b>Sex</b>			
Male	252 (84)	175 (58)	+26 (+17 to +35)
<b>Race/ethnicity</b>			
White	168 (56) 107 (36)	+20% (+10% to +31%)	
Hispanic	83 (28)	138 (46)	–18 (–28 to –8)
Black	36 (12)	44 (15)	–3 (–10 to +4)
Asian	1 (0)	2 (1)	–1 (–2 to +1)
Other	12 (4)	9 (3)	+1 (–3 to +5)
<b>Health insurance</b>			
CICP/CHS Discount Programs	122 (41)	63 (21)	+20 (+10 to +29)
Uninsured	114 (38)	109 (36)	+2 (–8 to +12)
Detoxification-sponsored coverage	19 (6)	6 (2)	+4 (0 to +9)
Corrections facility	14 (5)	22 (7)	–2 (–8 to +2)
Medicare	12 (4)	25 (8)	–4 (–9 to +1)
Medicaid	9 (3)	21 (7)	–4 (–9 to +1)
Private	2 (1)	50 (17)	–16 (–22 to –10)
Workman's compensation	0 (0)	2 (1)	–1 (–2 to +1)
Other	8 (3)	2 (1)	+2 (–1 to +5)

CICP, Colorado Indigent Care Program; CHS, Community Health Services.

\*Continuous data are presented as the median difference and categorical data are presented as the percentage difference. CIs adjusted for multiple statistical comparisons.

**Table 2.** EMS and hospital utilization between homeless and nonhomeless patients.

Characteristics	Homeless	Nonhomeless	Absolute Difference* (95% CI)
Ambulance used for transport, %	152/300 (51)	86/300 (29)	+22% (+12% to +32%)
Urgently transported to the ED, %	7/146 (5)	9/77 (12)	–7% (–17% to +4%)
Hospitalization, %	25/300 (8)	56/300 (19)	–11% (–17% to –3%)
Previous ED visits, No. †	2 (0-8)	1 (0-3)	+1 (–1 to +2)
ED length of stay, h †	4.4 (2.6–7.6) ‡	3.8 (2.2–5.7) §	+0.6 (+0.2 to +0.9)
Hospital length of stay, days*	3 (1–3)	2 (1–6)	+1 (–2 to +3)

\*Continuous data are presented as the median difference and categorical data are presented as the percentage difference. CIs adjusted for multiple statistical comparisons.

†Point estimates and variances are reported as medians and IQRs.

‡Range 0–115.

§Range 0–60.

Homeless patients also spent more time in the ED per visit (4.4 hours [IQR 2.6 to 7.5 hours] versus 3.8 hours [IQR 2.1 to 5.7 hours]), had similar numbers of previous ED visits (2 visits [IQR 0 to 8 visits; range 0 to 115 visits] versus 1 visit [IQR 0 to 3 visits; range 0 to 60 visits]), were less likely to be admitted to the hospital (8% versus 19%), and were more likely to use ambulance services (51% versus 29%). Of the 223 patients transported by ambulance, 207 (90%) were transported nonurgently. Of the 146 homeless patients transported by ambulance, only 7 (5%) were transported urgently, whereas of the 77 nonhomeless patients transported by ambulance, 9 (12%) were transported urgently (Table 2).

In comparisons of insurance status, homeless patients were more likely to belong to an indigent discount program, either the Colorado Indigent Care Program or the Community Health Services Discount Program (41% versus 21%), or have detoxification-sponsored coverage (6% versus 2%). Homeless patients were less likely to have private insurance (1% versus

17%) and had comparable levels of Medicaid (3% versus 7%), Medicare (4% versus 8%), corrections facility coverage (5% versus 7%), workman's compensation (0% versus 1%), and other forms of insurance (3% versus 1%) and were as likely to be uninsured (38% versus 36%) (Table 1).

The 5 most common diagnoses for patients who were homeless were laceration (14%); alcohol intoxication (9%); contusion, hematoma, or abrasion (8%); alcohol withdrawal (8%); and fracture, dislocation, or subluxation (6%). Besides alcohol intoxication and alcohol withdrawal diagnoses, the other 3 diagnoses were highly associated with alcohol use (40/84; 48%; 95% CI 37% to 59%). The 5 most common diagnoses for nonhomeless patients were laceration (12%); contusion, hematoma, or abrasion (9%); muscle or ligament strain (7%); fracture, dislocation, or subluxation (6%); and acute exacerbations of chronic obstructive pulmonary disease or asthma (5%). Of these 5 diagnostic categories, a significantly smaller proportion was associated with alcohol use (19/115; 17%; 95% CI 10% to 25%).

**Table 3.** Estimated benefit of emergency treatment between homeless and nonhomeless patients.\*

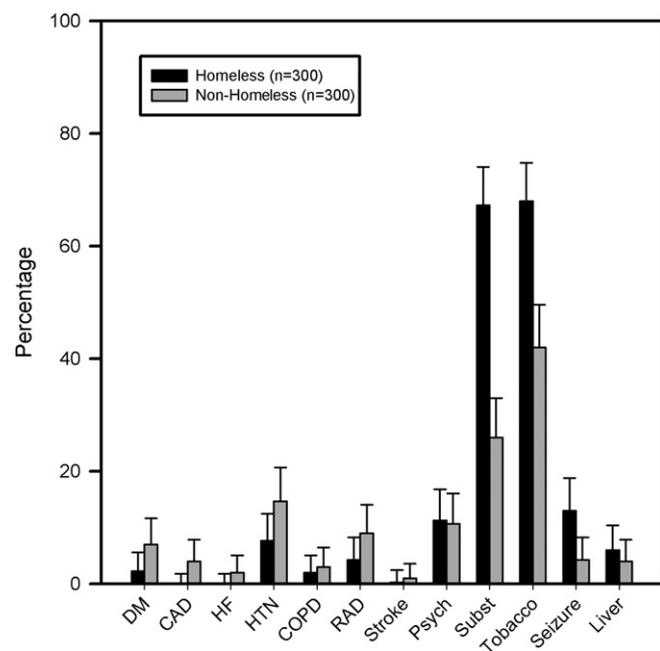
EBET Categories <sup>†</sup>	Homeless (n=300) (%)	Nonhomeless (n=300) (%)	Absolute Difference, %* (95% CI)
Significant	141 (47)	152 (51)	-4 (-14 to +7)
Possible	51 (17)	45 (15)	+2 (-6 to +10)
Unlikely	108 (36)	103 (34)	+2 (-8 to +12)

EBET, Estimated benefit of emergency treatment.

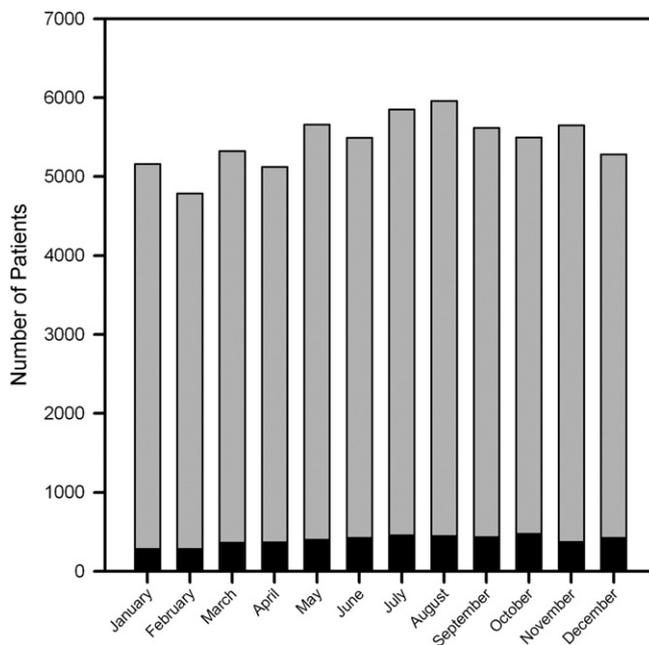
\*Overall raw agreement=0.80. Interrater agreement across all 3 EBET categories=0.71. Spearman-Brown coefficient for overall agreement=0.88.

<sup>†</sup>See text for definitions of EBET categories.

\*Presented as the percentage difference. CIs adjusted for multiple statistical comparisons.

**Figure 1.** Medical and social historical characteristics between homeless and nonhomeless patients. DM, Diabetes mellitus; CAD, coronary artery disease; HF, heart failure; HTN, hypertension; COPD, chronic obstructive pulmonary disease; RAD, reactive airways disease; Psych, psychiatric illness; Subst, substance abuse.

Finally, homeless patients received comparable levels of benefit from their ED visits compared with nonhomeless patients (Table 3). However, when evaluating the group of patients who were categorized as having received significant benefit, there were notable differences between the most common diagnostic categories. The most common diagnoses that homeless patients received significant benefit from included lacerations (13%); alcohol intoxication (5%); fracture, dislocation, or subluxation (5%); and cutaneous abscesses (3%). The most common diagnoses that nonhomeless patients received significant benefit from included lacerations (11%); fracture, dislocation, or subluxation (5%); acute exacerbations

**Figure 2.** Total number of homeless (n=4,844 across the entire year) (black bars) and nonhomeless (n=60,575 across the entire year) (gray bars) patient visits to the ED, stratified by month, during 2003.

of chronic obstructive pulmonary disease or asthma (4%); cutaneous abscesses (2%); and cellulitis (2%).

A higher percentage of homeless patients had substance abuse and tobacco use histories but had relatively similar medical and psychiatric comorbidities compared with nonhomeless patients (Figure 1). In addition, homeless patients were more likely to have a history of a seizure disorder but less likely to have a history of coronary artery disease compared with those who were nonhomeless, although the number of patients who carried these diagnoses was relatively small.

When data were categorized by month of year, a similar proportion of homeless patients visited the ED, without a specific trend across seasons (Figure 2). The median number of total patient visits per month was 5,037 (IQR 4,861 to 5,262) and the median number of homeless patient visits per month was 421 (IQR 376 to 450). Visits by homeless patients accounted for less than 10% of the total visits during each month (Figure 2).

## LIMITATIONS

There were several important limitations to our study. First, this study was performed at a single institution in Denver, CO, and although Denver Health Medical Center is the safety-net hospital for Denver and Denver County, our results may not be representative of other institutions or geographic locations. Although residency status was collected prospectively by ED registration personnel, it was done so for purposes of patient care and not research. We obtained residency status in a retrospective evaluation of each patient's medical record, and

although this process was performed systematically, the validity of this categorization is a possible source of bias. Our definition of homeless likely excluded those who were truly homeless but provided false or incorrect residency information. Thus, many homeless patients were likely excluded from the study group and perhaps inadvertently included in the control group if they gave false or temporary address information to the registration staff personnel.

We did not specifically control (either through stratification or adjusted analyses) for specific confounders that may have affected emergency medical care utilization or estimated benefit of emergency treatment. In addition, this study may have been limited by additional selection biases. We attempted to minimize this form of bias by performing simple random sampling from all patient visits during 2003 and categorized by homelessness to provide an unbiased estimate of emergency care utilization characteristics across those 2 groups. It is possible, however, that our selection process did not result in truly random samples, thus introducing sampling error. Other forms of informational biases, including misclassification biases introduced during retrospective data collection, may have occurred. We believe that such forms of bias were minimized by systematic data collection and close supervision of study procedures by the investigators. In an effort to estimate medical benefit of emergency treatment, we used a previously derived instrument to determine levels of benefit for each visit. No other method currently exists for estimating such benefit, and although the estimated benefit of the emergency treatment instrument was systematically developed by emergency medicine experts (ie, face validity), it has not yet been more rigorously validated for estimating benefit from emergency care.<sup>12</sup> Finally, because the sample size was not calculated according to a single primary study hypothesis, it is possible that our study was underpowered to identify a significant difference, especially with respect to the estimated benefit of emergency treatment.

## DISCUSSION

Because of the exact nature of the problem, it is difficult to conduct a population-based study on homelessness and, thus, its impact on EMS and ED utilization. As a result, we conducted a comparative study between homeless and nonhomeless patients who presented to an urban inner-city ED in a large metropolitan city during 2003. The results of our study indicate that homeless patients visited our ED approximately 7% of the time. In addition, homeless patients were more likely to use ambulance services, stay in the ED longer, and be hospitalized less often while receiving a comparable level of benefit of emergency medical treatment compared with nonhomeless adults.

To our knowledge, our study is the first to evaluate seasonal patterns and out-of-hospital EMS utilization by homeless patients. We identified no distinct seasonal variations in the use of the ED by homeless patients. Although one might expect an increased utilization rate during winter months, this was not observed and may reflect an increased capacity of shelter

resources during these months. Our study also demonstrates a significantly higher level of out-of-hospital care use by homeless patients, even with resources such as a hospital-affiliated detoxification facility and transportation services for intoxicated homeless patients. Almost all transports across both study groups were nonemergency, suggesting, however, that the level of medical acuity in general was relatively low.

Homelessness in the United States continues to be a social and public health problem, with as many as 3.5 million people likely to experience homelessness in any given year.<sup>1</sup> In Philadelphia, homeless patients have an age-adjusted mortality rate nearly 4 times that of the general population, even when controlling for all substance abuse.<sup>14</sup> As such, it appears that homelessness is an independent risk factor for deteriorating health and mortality.

According to the Sixth Annual Point-in-Time Study, approximately 5,000 people were classified as homeless in Denver County at the beginning of 2005.<sup>15</sup> With a total approximate population of 556,000, this represents about 1% of the population. With limited resources and access to health care, the ED is the primary safety net for those who are homeless. In a national survey performed by Kushel et al,<sup>16</sup> it was found that 32% of homeless patients visited an ED during the preceding year, and in a retrospective review from Australia, 41% of the repeated ED presentations were by people who were homeless.<sup>17</sup>

We further attempted to identify the cause of this increase in ED utilization by homeless patients. Our data indicate that ED utilization by homeless patients is mostly associated with alcohol use. Of the 133 homeless patients in the leading 5 diagnoses, 67% were either due to alcohol intoxication or alcohol withdrawal. This significantly contrasts with nonhomeless patients in that only 17% of their visits were associated with alcohol use. Alcohol abuse appears to significantly contribute to ED use by homeless patients. A recent systematic review of interventions for homeless people with substance abuse histories revealed a limited number of good- or fair-quality controlled studies of interventions for such patients.<sup>18</sup> In this review, case management resulted in greater decreases in substance abuse than did usual care. Public health-related programs aimed at alcohol abuse in this population may decrease their overutilization of emergency medical care resources.

Kushel et al<sup>16</sup> previously attempted to identify factors associated with health care utilization of homeless patients by interviewing homeless adults in homeless assistance programs throughout the United States. They reported that having health insurance was associated with a greater use of ambulatory care and inpatient hospitalization and reduced barriers to needed care and prescription medication compliance. However, insurance status was not associated with ED visits. Our data show comparable numbers of uninsured patients between the 2 study cohorts, but homeless patients were more likely to be enrolled in the Colorado Indigent Care Program or Community Health Services Discount Programs. Although these programs are technically not medical insurance, it does offer medical

resources at discounted rates. Although nonhomeless patients had higher levels of private insurance, when Colorado Indigent Care Program and Community Health Services Discount Program coverage was accounted for, both groups had comparable levels of insurance status.

The use of inpatient hospital resources by homeless patients has also been previously studied. A retrospective cohort study performed in 1998 in New York City found that homeless patients stayed about 4 days, or 36%, longer per admission on average than the other patients, even after adjustments were made for differences in the rates of substance abuse and mental illness and other clinical and demographic characteristics.<sup>6</sup> The leading cause of the increased length of stay was for placement. In contrast, our study revealed that homeless patients were less likely to be admitted to the hospital and that there was no statistically significant difference in the length of hospital stay between homeless and nonhomeless patients. Perhaps this is due to resource differences for respite beds or the disparity between homeless patients and the need for respite beds between New York City and Denver.

Homeless adults commonly use emergency medical care resources, and medical benefit, although comparable to that of nonhomeless adults, is in many cases uncertain. As homelessness continues to exist, it is likely that out-of-hospital and emergency care resource utilization by this group of patients will continue. Preventative care measures specifically aimed at reducing alcohol abuse or improving access to primary health care may alleviate this potential strain on the out-of-hospital and emergency medical care systems.

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*Author contributions:* DAP and JSH conceived and designed the study. DAP and ARB collected the data. DAP and JSH analyzed the data and performed the estimated benefit of emergency treatment analysis. JSH performed the statistical analysis of the data, with input from DAP. DAP and JSH drafted the article. DAP takes responsibility for the paper as a whole.

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