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Community hospital admission from the emergency department by persons with substance use disorders ☆

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ABSTRACT

Persons with a substance use disorder (SUD) are less likely to be insured and may have limited access to appropriate care, thereby increasing their reliance on emergency departments (EDs). We investigated whether health conditions and insurance status are significant predictors of admission to a community hospital directly from an ED visit with an SUD diagnosis. We analyzed the 2008 Nationwide Emergency Department Sample of the Healthcare Cost and Utilization Project. Lack of health insurance was disproportionately likely in ED visits that carried an SUD diagnosis, whether alcohol- or drug-related. Using regression analysis, most SUD and non-SUD diagnostic categories and many procedure categories were significantly related to subsequent hospital admission. Controlling for clinical characteristics, SUD-related ED visits covered by public or private insurance had substantially higher odds of leading to hospital admission than did uninsured visits. Policies that broaden insurance coverage may improve access to inpatient care for persons with SUDs.

1. Introduction

Emergency departments (EDs) provide a substantial amount of treatment to persons with substance use disorders (SUDs). Analyses of the Healthcare Cost and Utilization Project (HCUP) Nationwide Emergency Department Sample (NEDS) reveal that 4.3 million ED visits in 2007 (4.6% of all ED visits) carried an SUD diagnosis (Owens, Mutter, & Stocks, 2010).

Federal agencies such as the Substance Abuse and Mental Health Services Administration (SAMHSA) and Agency for Healthcare Research and Quality (AHRQ) are concerned about access to care by persons with SUDs. The ED is a common point of access to the health care system for persons with SUDs, particularly those who lack insurance. Yet while valuable, ED care represents stabilization rather than ongoing treatment. It is important to look beyond ED care to see whether persons with SUDs are obtaining the treatment they need.

EDs have a legal mandate to provide health care under the Emergency Medical Treatment and Active Labor Act. Individuals arriving at an ED, regardless of insurance status or ability to pay, must receive a medical examination and treatment until stabilization is achieved or arrangements for an appropriate transfer have been made. The law does not guarantee inpatient care following stabilization, however, which raises the question of whether uninsured people obtain appropriate follow-up care. One study found that uninsured people, who accounted for 17.7% of all ED visits in 2006, were 40% more likely than insured people to leave the ED without inpatient admission (Owens & Mutter, 2009).

The purpose of the present investigation was to determine whether the insurance status of persons with an SUD is significantly correlated with the probability of admission to a community hospital once we control for patient and hospital characteristics. First, we analyze a nationally representative sample of ED visits in 2008 to determine demographic, patient and hospital characteristics and type of insurance for persons with and without an SUD. We then develop and test a model of hospital admission following an ED visit. If clinical need for services alone is driving the difference in admission rates, then coefficients on the insurance variables will be insignificant after controlling for patient diagnoses. If insurance type is a significant predictor, however, then we may conclude that financial considerations of the hospital or the patient are driving admission rates among uninsured people with SUD diagnoses. The results may impact current health care policies and suggest changes that may be needed with upcoming reforms.

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2. Materials and methods

2.1. Data source

Our data source was the 2008 NEDS, a member of the HCUP family of databases sponsored by AHRQ (HUCP NEDS, 2008). The NEDS is the largest all-payer ED database in the United States. It contains information on hospital characteristics, patient characteristics, geographic region, and reason for the ED visit. Insurance type reflects the expected primary payer reported by the state HCUP data source. Insurance options include Medicare, Medicaid, private insurance, other insurance (workers compensation, Departments of Defense and Veterans Affairs benefits, Title V, and other government programs) or none (uninsured).

The NEDS is designed to be nationally representative of all community-based hospital EDs; it excludes long-term, federal, and rehabilitation hospital services. NEDS data include information on care in hospital-based units that deliver psychiatric and substance abuse services; they do not include information from "free-standing" and private psychiatric or substance abuse treatment facilities. The data approximate a 20% stratified sample of hospital EDs and feature information on 28 million ED visits to over 950 hospitals. Through weighting, the 2008 NEDS data represent 125 million ED visits at nearly 1,000 hospitals in 28 states.

The unit of NEDS data is the ED visit rather than the individual. A single person could appear multiple times in the data if he or she had more than one ED visit in 2008.

2.2. Study population

The study population consisted of all ED records for adults 18 years and older. Following initial descriptive statistics, we further limited the analyses to persons with ages 18–64 years. Data on children and adolescents were excluded from the analyses because of the various state-level programs that give children greater access to health care benefits than low-income adults enjoy. Adults over the age of 65 years were excluded because nearly all Americans in this age group are covered by Medicare, and so the proportion of uninsured ED visits drops dramatically after that age. ED visits with SUD diagnoses also decline sharply after the age of 65 years in the Medicare population.

We considered a visit to be SUD-related if there was a principal or secondary SUD diagnosis on the record. The diagnoses we used for drug abuse or dependence excluded codes for medication error and remission. Secondary diagnoses were included because SUD-related conditions are sometimes recorded as the primary diagnosis, rather than the SUD itself. For example, a person who presents with stomach pain due to chronic alcohol consumption may receive a primary diagnosis of a gastrointestinal disorder and a secondary diagnosis of alcohol abuse or dependence.

2.3. Data analysis

We first derived descriptive statistics for patient characteristics, the safety-net classification of the hospital, the primary insurance type, and the patient's discharge status. The results were summarized in table form.

2.3.1. Regression analysis

Our primary interest was to explain why uninsured persons with an SUD-related ED visit were less likely to be admitted to a hospital from the ED than were insured persons with an SUD-related visit. We estimated four logistic regression models with inpatient admission to a community hospital as the dependent variable. The models differed by the population sample: all visits with any SUD diagnosis, alcohol-only visits, drug-only visits, and visits with both alcohol and drug diagnoses.

We considered alternative definitions of the dependent variable that included admission to intermediate care facilities such as rehabilitation facilities or skilled nursing facilities (SNFs). The narrowest definition was selected for two reasons. Some individuals enter an ED from a substance abuse rehabilitation facility or SNF and then return there after discharge; including such individuals would bias the outcome. As well, a great deal of substance abuse treatment has been shifted to community hospitals from free-standing treatment facilities over the last 20 years.

The primary payer categories represented the variable of interest. Being uninsured was the reference category, and so an odds ratio above 1.0 for another insurance type (Medicare, Medicaid, private insurance, or other) would indicate that visits primarily funded by that insurance were more likely to end in admission, all else being equal.

To determine the role of insurance status in the admission probability, we must control as much as possible for differences in clinical need. We therefore added demographic and clinical covariates to the models to account for factors that could affect the probability of admission but which are not directly caused by a lack of insurance. The two demographic factors were age and gender. Our baseline regression model included 22 clinical indicator variables for the first-listed (primary) diagnosis. The variables corresponded to the diagnostic chapters in the 2008 *International Classification of Diseases, Ninth Revision, Clinical Modification* (*ICD-9-CM*) codebook (Hart & Stegman, 2007): infectious disease, neoplasms, endocrine disorders, etc. For example, an ED visit with a primary diagnosis of diabetes with renal manifestation (ICD 250.4) would be coded as '1' for the indicator variable corresponding to endocrine disorders (ICD range 249–259). All other primary diagnosis variables would be coded as '0' for this encounter. The set includes an indicator for primary alcohol disorders and another for primary drug disorders. Separate variables were created for visits related to birth or to acute myocardial infarction in the belief that ED visits for these reasons would be likely to end in hospital admission. Similar indicator variables were assigned for secondary diagnoses. Multiple secondary diagnoses were captured by positive ('1') values for the all relevant diagnosis categories.

We created eight procedure variables that correspond to the chapters of the 2008 *ICD-9-CM* procedure codebook (anesthesia, surgery, etc.). We separated evaluation and management codes into two groups, critical and noncritical care, in the belief that critical-care admissions would be more likely than others to lead to admission. We created a separate category for cardiopulmonary resuscitation for the same reason.

The regression models also included variables for hospital type. There were indicator variables for primary safety-net hospitals, secondary safety-net hospitals, and teaching hospitals. There were also indicator variables for ownership type, either public, private not-for-profit, or private for-profit; the reference category was private for-profit.

We carried out two types of sensitivity analyses. In the first we limited the regressions to individuals who received a primary SUD diagnosis during the ED visit. Their probability of admission could be substantially different from those of many people receiving secondary SUD diagnoses.

The baseline approach to controlling for diagnoses could be called naive because the variables are based on clinical category rather than on characteristics such as severity or the ability to predict mortality total costs of stay. To our knowledge no diagnostic system has been developed for predicting readmission. We therefore tested an alternative system based on clinical severity, as severity ought to correlate with the probability of admission. We applied the Chronic Illness and Disability Payment System (CDPS), a diagnosis-based risk-adjustment model that assigns a record to one of 20 categories, each represented by an indicator variable (Kronick, Gilmer, Dreyfus, & Lee, 2000). The categories are ranked to reflect the most severe condition