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Original Research

Association of increased emergency rooms costs for patients without access to necessary medications

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Abstract

Background: Prescription medications are an important component of chronic disease management. They are vital in preventing unnecessary ER visits. However, few studies have examined the association between patients' self-reported inability to receive necessary medications and emergency room costs.

Objectives: The study objectives were to: 1) determine differences in ER costs based on self-reported ability to obtain necessary medications. 2) identify differences in ER costs based on self-reported ability to obtain necessary medications among medication users. The association was also examined by insurance category.

Methods: Respondent data from 10 years (2002–2011) of the U.S. Medical Expenditure Panel Survey was analyzed. The models employed estimated the association of respondents reporting being 'unable to receive necessary medications' on ER expenditures. Secondly, the relationship was assessed by insurance category: private, public, and uninsured. Two-part cost regression models with bootstrapped estimates to produce 95% confidence intervals of cost differences were applied for these analyses. Significance was set at $\alpha = 0.05$. Analyses were completed using SAS 9.4 (Cary, NC) and Stata 13 (College Station, TX). Estimates were in 2011 US dollars.

Results: People unable to receive necessary medications experienced increased average annual ER costs of \$46.62 with 95% a confidence interval [CI] of 34.76–58.49) compared to patients able to receive necessary medications.

By insurance category, respondents unable to receive necessary medications experienced increased ER costs of \$104.80 (95% CI: 60.57–149.03), \$42.16 (95% CI: 24.65–59.68), and \$33.18 (95% CI: 18.54–47.82), for Publicly Insured, Privately Insured, and Uninsured, respectively. Findings were similar for those already using medications.

Conclusions: Inability to obtain necessary medications is associated with increased emergency room costs. Those with public insurance have a larger increase in ER costs if they are without necessary medications compared to those insured privately or without insurance.

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Introduction

Prescription medications prevent the acute sequelae of chronic diseases that result in emergency and inpatient care.^{1,2} Suboptimal consumption of necessary medications translates into poor management of chronic illnesses³ and is associated with higher utilization of health care.^{4–8} Osterberg and Blaschke estimated that 33–69% of hospital admissions were related to poor medication adherence at an associated cost of \$100 billion a year.⁹ Research by Law et al discerned four unmet needs in the medication use process: 1) Patients see the physician at the right time. 2) Patients use medications as directed. 3) Patients receive adequate counseling. 4) Patients are monitored appropriately. This work revealed that patients understood the importance of taking their medications as directed and that they shared some responsibility in accomplishing in doing so.¹⁰ Van Servellen et al found that factors associated with access to care in terms of cost and ability to see medical specialists were correlated with adherence in patients with HIV.¹¹ However, the scientific literature is confounded by a variation in the explanatory factors of appropriate consumption and a wide range in the measured extent of their impact.^{12,13} Publications from controlled clinical trials with robust internal validity are likely needed to ascertain predictive characteristics. Individuals who are not able to receive needed medications are at risk for diminished management of their syndrome.^{14,15} Separate recent studies found appropriate medication consumption was associated with a 18–19% reduction in coronary artery disease events.^{16,17} This loss of therapeutic control translates to increases in catastrophic health service use and the concomitant medical costs.^{18,19} However, the subsequent health care resource use is largely unknown for patients who specifically realize they are in need of prescription medications, but are unable to obtain them. Thus, additional research is needed in quantifying the association between access to medications and downstream health system costs. Our goal was to quantify the association between individual emergency room costs and inability to receive necessary medications using a pooled 10-year publically available, health services dataset of people living in the U.S.

Methods

Sample

Respondent data from the most recent 10 years (2002–2011) of released data from the Medical

Expenditure Panel Survey [MEPS] Household Component [HC] files and Medical Conditions files was analyzed to answer the research question. The final analysis dataset was created by pooling the annual cross-sectional datasets in the 10 year period. Respondents included were ages 18–64 years old. Respondents were determined to be unable to obtain necessary medications based on selecting ‘yes’ to a question asking if “in the last 12 months they were unable to obtain prescription medications they or a doctor believed necessary.” Only patients that needed medications were included in this analysis (i.e. those that answered ‘inapplicable’ to the question asking if they were unable to receive necessary medications were not included in the analysis set). MEPS is designed to provide a national reflection of family and individual demographic characteristics and health services use.^{20,21} The HC and Medical Conditions files are data from a sample of families and individuals in selected communities across the United States, drawn from a nationally representative subsample of households that participated in the National Health Interview Survey from the prior year with oversampling of minorities and the poverty stricken.^{22–24}

Statistical analysis

Estimation was performed to measure the effect of survey respondents reporting being ‘unable to receive necessary medications’ on ER expenditures using survey data extracted from a national dataset of health services use in the United States. Secondly, the relationship by insurance category was estimated: private, public, and uninsured. For valid estimates to be measured, patient characteristics that could jointly influence the likelihood of exposure and outcome must be adjusted.²¹ For this reason, multiple regression adjusting for influential characteristics was implemented. This involved use of a 2-part generalized linear model with 1000 bootstrapped estimates to produce 95% confidence intervals of cost differences using the direct substitution method. This method incorporates the likelihood of an individual incurring costs as well as the average estimate of the individual’s costs based on their characteristics employing the survey weighting in incremental dollar changes.²⁵ The regression model dependent variable was costs in 2011 \$US.

Regression model independent variables

Variables included for adjustment of confounding were age, gender, race, poverty status, marital status, census region, insurance coverage status,

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