

## Hospitalization Costs Associated With Homelessness in Canada

Hwang SW, Weaver J, Aubry T, Hoch JS. Hospital costs and length of stay among homeless patients admitted to medical, surgical, and psychiatric services. *Med Care* 2011;49:350-4.

### Study Overview

**Objective.** To compare hospitalization costs for homeless and housed patients.

**Design.** Retrospective analysis using hospital administrative data.

**Setting and participants.** This study obtained hospital discharge data for all adult admissions between April 2002 and March 2007 from St. Michael's Hospital, a 500-bed academic teaching hospital that accounts for 25% of all hospitalizations among homeless patients in Toronto. For each discharge, patient characteristics and costs were collected.

**Main outcome measures.** The main outcome measure was total cost of each hospital discharge, determined by the Ontario Case Costing Initiative (OCCI) methodology. For each hospitalization, the OCCI methodology calculates the direct costs from the departments that provide direct patient care (eg, nursing) and the indirect costs from departments that do not provide direct patient care (eg, administration). These costs are summed to get the total cost of hospital discharge. The primary independent variable was homelessness status, obtained via administrative data. Homeless adults were those who had a special indicator for homelessness status at admission. Additional indicators of homelessness were discharges to a homeless shelter, "no fixed address," or a postal code that was a place-holder reserved for homeless individuals. Age, sex, resource intensity weight (RIW), and length of stay in the hospital were covariates included in the analysis. RIW is a measure of an individual's use of hospital resources compared to that of an average hospitalization, and was used as a proxy for illness severity. Length of stay in the hospital was categorized as acute care days and alternate level of care (ALC) days. Under ALC, patients remained hospitalized while awaiting an appropriate disposition to either rehabilitation, a long-term care facility, or a homeless

shelter in the case of homeless patients. There were 3 service categories for discharges: medical, surgical, and psychiatric. The authors conducted linear regression analysis to look at the association between cost of hospital discharges and housing status, adjusting for age, sex, RIW, and length of stay in the hospital.

**Main results.** There were a total of 3081 discharges of homeless patients compared with 90,345 discharges of housed patients. Homeless discharges cost on average \$961 more than housed discharges ( $P = 0.07$ ). Homeless discharges were more likely to be men ( $P < 0.001$ ), younger adults ( $P < 0.001$ ), and have a lower RIW ( $P < 0.001$ ). Homeless discharges had mean acute care days that were 2.32 days longer ( $P < 0.001$ ) and ALC days that were 1.14 days longer than housed discharges ( $P < 0.001$ ). In unadjusted analysis, total cost and mean number of acute care days was higher for homeless compared to housed discharges on the medical services, but not surgical or psychiatric. ALC days were higher for both medical and surgical, but not psychiatric services. After adjusting for age, sex, and RIW, homeless discharges cost on average \$2559 more than housed discharges ( $P < 0.001$ ) for all services. When acute care days and ALC days were added to the model for all services, homeless discharges cost \$1508 less than housed discharges ( $P < 0.001$ ). There were differences in health care costs by service categories. For medical and surgical services, homeless discharges cost more than housed discharges after adjusting for age, sex, RIW, and acute care days. However, when ALC days were added to the models, there was no difference in cost between the 2 groups. On psychiatric services, adjustment for all factors, including hospital length of stay, did not mitigate the higher costs among homeless compared with housed discharges (an excess cost of \$1058 per discharge,  $P < 0.001$ ).

**Conclusion.** Among a large administrative sample of hospital discharges, homeless discharges cost on average \$960 more than housed discharges. After adjustment

for age, sex, and RIW, homeless discharges cost \$2559 more than housed discharges for all health care services. For medical and surgical services, the number of days spent under ALC explained the difference in hospital costs for homeless compared to housed patients. Among psychiatric services, reasons other than hospital length of stay account for the higher costs for homeless compared to housed patients. These data suggest a need for interventions that decrease length of stay in the hospital and increase access to community mental health services for homeless adults.

### Commentary

Hwang et al examined the costs of hospital discharges for homeless and housed patients in Canada. Unlike a previous analysis done in the United States, where hospital length of stay was used to calculate the differences in hospitalization costs between homeless and housed patients [1], this analysis used individual patient costing data. The results showed that homeless patients have longer lengths of stay on medical and surgical services, resulting in increased health care costs. However, for psychiatric services, factors other than length of stay contribute to the increased costs among homeless patients. The results of this study suggest that higher costs among homeless patients, although mitigated, may not be completely eliminated under a universal health care system, suggesting nonfinancial barriers to comprehensive health care.

The cost of hospitalization for homeless compared with housed patients was comparable in the Canadian and the U.S. studies. In this study, there was an increase of \$2559 (Canadian dollars) per hospital discharge for homeless compared with housed patients. In the U.S. study, where length of stay was used to estimate costs, homeless patients cost on average \$2414 more than housed patients for all types of service [1]. In the current study, homeless patients had longer ALC days than housed patients. Respite care has been shown to decrease hospital lengths of stay and readmissions by providing acute and subacute pre- and postoperative, recuperative, rehabilitative, and end of life palliative care for homeless adults [2–4]. Given that homeless adults experience high hospitalization rates [5] that are longer than average [1], expanding the network of respite care facilities and increasing access to these resources may decrease inpatient medical and surgical health care costs.

Homeless adults had increased costs for psychiatric services despite adjustment for hospital length of stay, suggesting a higher intensity use of these resources. Homeless adults have a high prevalence of mental illness and substance use disorders [6], and are frequent utilizers of homeless services, medical care, mental health, and criminal justice systems [7]. Studies in the past few years have explored supportive housing as a cost-effective solution for decreasing health services use [8] and improving health and health care outcomes among the homeless population. These studies have found that for chronically homeless adults with severe mental illness and substance use disorders, supportive housing programs may decrease costs related to the use of health care, social services, and criminal justice systems [9,10]. In addition, providing consistent access to community mental health and substance use treatment may decrease reliance on hospital-based services for exacerbations that might be preventable [11].

The current study has limitations. Because data were abstracted from hospital administrative records, there is a potential for misclassification of homelessness status. This study was unable to determine whether use of hospital-based services could have been prevented by adequate primary care. Despite these limitations, the authors described a novel way to examine health care costs from hospitalizations for homeless and housed patients. Their results support the use of respite care services for decreasing length of hospitalizations, and increasing access to community-based mental health programs to reduce dependency on inpatient psychiatric care.

### Applications for Clinical Practice

Although this study was done in Canada under a universal health care system, it has implications for health care for the homeless in the United States. A single-payer, universal health insurance system is needed to eliminate financial barriers to access to primary care for homeless adults, thereby reducing reliance on emergency services and hospitalizations for preventable medical conditions. However, this is not enough. Data from this study and others in the United States offer evidence for providing supportive housing, intensive case management, and community-based outreach interventions for mental health, and improving the coordination of health care between the medical and homeless services providers, particularly for chronically homeless individuals with severe mental illness.

—Review by Maya Vijayaraghavan, MD

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