



Impact of homelessness and unstable housing on adolescent health



Michael J. Cima, R. David Parker*

West Virginia University, School of Public Health, 1 Medical Center Drive, HSC N G104, Morgantown, WV 26506, USA

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ABSTRACT

The purpose of this study was to describe service utilization and associated costs of a statewide, Medicaid-insured population of homeless adolescents (HA). This was a secondary data analysis of statewide individual service-level data. The total costs for this sample ($n=5259$) was \$84,077,009 over the study period. Mental health related services accounted for 40% of all costs. A small subpopulation ($n=65$) of the sample accounted for 28% of the total costs, all of which had mental health related services. In order to reduce costs and improve health outcomes, there is a need to expand mental health services for HA.

1. Introduction

Homelessness persists as an international public health concern, with more than 500,000 homeless individuals in the United States and 400,000 in the European Union on any given night ("The 2015 Annual Homeless Assessment Report to Congress," 2016; Fazel, Geddes, & Kushel, 2014). However, the prevalence of homelessness may not be comparable between countries due to the lack of a unifying definition of what constitutes being homeless. For example, the European Union considers those who are 'unsheltered' to be homeless, but there is variation between countries with other components of the definition of homelessness (Fazel et al., 2014). Comparatively, the United States defines chronic homelessness as one year or more of homelessness or four occurrences in the last three years (Defining chronic homelessness: a technical guide for HUD programs, 2007). Despite these differences in definitions, the United States in particular struggles with homelessness.

Homelessness in the United States diminishes public health, the financial wellbeing of health care institutions, and has negative impacts on communities beyond these factors (Fitzpatrick, La Gory, & Ritchey, 2003; Larimer et al., 2009). Healthcare access among persons experiencing homelessness (PEH) is compounded by the lack of housing itself, as PEH are less likely to be connected to regular medical care due to lack of transportation, no insurance, substance abuse issues, and mental illness among others (Parker & Dykema, 2013). As a result, there is a high utilization of acute care services among PEH, and increasing costs often absorbed by health care institutions (Han & Wells, 2003; Kushel, Vittinghoff, & Haas, 2001; Zur, Mojtabei, & Li, 2014).

Health care costs for PEH in the United States have been studied extensively with many studies using macro level data, such as national

or state indicators, which do not necessarily translate to the individual service level (Peterson et al., 2015). Although macro scale studies using administrative or billing data have utility, individual level data may be more important to practitioners who wish to translate findings into practice. Practice-based research could improve services for PEH and delivery by agencies.

Characterized as a population with high rates of mental illness, substance abuse, sexually transmitted infections, and victimization, homeless adolescents (HA) are especially vulnerable, and experience unique barriers to care (Ammerman SD et al., 2004). In particular, HA tend to be under- or uninsured, consequently reducing primary healthcare utilization, and increasing emergency department use (Christiani, Hudson, Nyamathi, Mutere, & Sweat, 2008; Kushel, Perry, Bangsberg, Clark, & Moss, 2002; Winetrobe, Rice, Rhoades, & Milburn, 2016). In addition, homeless and precariously housed adolescents have less knowledge about their eligibility for government health insurance programs, like Medicaid, compared to their housed counterparts (Fryling, Mazanec, & Rodriguez, 2015). Adolescents with low-income, pre-existing disabilities, or certain familial situations are automatically eligible for Medicaid coverage, and as of 2015, over 36 million adolescents were insured by Medicaid ("2015 Number of Children Ever Enrolled Report", 2016). However, homelessness is a costly challenge to insurers. A large proportion of Medicaid enrollees who are homeless receive services reimbursed through fee-for-service arrangements. (USDHHS, 2014) While constituting a small number of Medicaid beneficiaries, fee-for-service enrollees account for the majority of Medicaid spending due to frequent hospitalizations (Billings & Mijanovich, 2007).

According to the 2015 Annual Homeless Assessment Report (AHAR), on a single night there were 180,760 HAs (under 25 years

* Correspondence to: West Virginia University, 1 Medical Center Drive, HSC Annex G103, Morgantown, WV 26506, USA.
E-mail address: rdparker@hsc.wvu.edu (R.D. Parker).

old), representing almost one third of PEH ("The 2015 Annual Homeless Assessment Report to Congress," 2016). This estimation is derived from a bi-annual point in time count in which volunteers and service providers seek out PEH. Although useful, point in time counts are methodologically limited and likely underestimate the actual number of PEH. Strict definitions of homelessness, as well as barriers specific to rural areas, including remote locations, lack of resources and isolation social networks, contribute to the underestimation of the true number of homeless individuals (Link et al., 1995; Tompsett, Toro, Guzicki, Manrique, & Zatakia, 2006).

This study builds on current research methodologies but focuses on the financial implications and healthcare utilization of HA. Information obtained may elucidate areas for interventions to reduce healthcare costs associated with providing care and services to HA.

2. Methods

This secondary data analysis was conducted on a linked, individual service level data system including persons receiving at least one housing or homeless service, one Medicaid service, reside in the state of West Virginia (WV), and who were 24 years of age or younger. We used Housing and Urban Development's (HUD) definition of chronically homeless, which is one year or more of homelessness or four occurrences in the last three years (Defining chronic homelessness: a technical guide for HUD programs, 2007). The service dates were 01 January 2012 through 31 March 2015. The study was acknowledged by the university IRB as an exempt protocol. The state of West Virginia's Homeless Management Information System (HMIS) contains records of persons receiving services related to housing and homelessness and is estimated to cover 90% of the PEH population. These persons were then linked to their records from the statewide Medicaid dataset using social security number and date of birth. Once the linkages were complete, the data were deidentified for the purposes of this study.

Data included demographics and service data, such as: date and type of each health service accessed; service provider; location of provider; type of service; date of birth; race; payor/insurer; ICD 9 codes of diagnoses at visit; prescriptions; and all total visit charges. Frequencies and percentages were used to describe categorical data, while medians and ranges were used to summarize continuous data. Medians were used to reduce the influence of extreme values. Since this dataset was compiled at the service and individual visit level, subsetting was used to de-duplicate data for descriptive purposes. Analyses involving cost data were conducted on the full, duplicated dataset. R was used for all analyses (Team, 2016).

3. Results

A total of 5259 HAs received at least one homeless service and one Medicaid service between 2012 and 2015. This sample was comprised of approximately equal numbers of men ($n=2,608$, 49%) and women ($n=2,598$, 49%), was predominantly white ($n=3,754$, 74%); with most persons aged 5–18 years ($n=2,571$, 54%). Disabling conditions, those expected to be of a long-term duration were reported among 12.4% ($n=545$); 8.7% ($n=365$) were chronically homeless, and 2.4% ($n=123$) had been continuously homeless for at least one year. The most common diagnoses were routine infant or child health check ($n=697$, 13%), ADHD ($n=150$, 3%), and acute upper respiratory infection ($n=150$, 3%).

The total healthcare costs across all visits and service providers was \$84,077,009 for the 2012–2015 period. These costs were categorized as: practitioner costs, prescription costs, and other costs. Other costs included incentives, capitation, dental, facility encounter, inpatient, inpatient crossover, long term care, non-facility encounter, outpatient, outpatient crossover, Part B crossover, and voids. Medians and ranges for each of these types of costs are reported in Table 1. Data from the ten costliest patients are presented in Table 2. These ten individuals

Table 1

Characteristics of homeless adolescents, 24 years and younger, receiving one homeless service and one Medicaid service, 2012–2015 ($n=5259$).

Characteristic	Frequency (%) ^a
Gender	
Male	2608 (49.6)
Female	2598 (49.4)
Race	
White	3886 (73.9)
Black	1131 (21.5)
Other	242 (4.6)
Age Category	
< 5	853 (16.8)
5–17	2751 (54.1)
18–24	1482 (29.1)
Disabling Condition?	
Yes	545 (12.4)
No	3839 (87.1)
Chronically Homeless?	
Yes	365 (8.7)
No	3848 (91.3)
Continuously Homeless? (1 year)	
Yes	123 (2.4)
No	799 (15.7)
Costs	Median (min - max)
Practitioner costs	\$70.51 (\$0.00 - \$6969.00)
Prescription costs	\$9.80 (\$0.00 - \$24,990.00)
Other total costs ^b	\$73.82 (\$0.00 - \$53,600.00)
TOTAL	5259

^a Variable totals may not equal 5259 due to missing values.

^b Other costs included incentive pays, capitation, dental, facility encounter, inpatient, inpatient crossover, long term care, non-facility encounter, outpatient, outpatient crossover, Part B crossover, and voids.

accounted 2% of the total cost of the sample ($n=5259$) at nearly \$1.4 million over three years. In this subgroup, women (\$836,859.34) and HAs between 18 and 24 years (\$869,588.46) had the highest expense totals.

The most frequent service types provided by practitioners or other care providers and associated costs are outlined in Table 3. Mental health related services were the most frequent and costly type of service provided for this sample with 72,662 patient visits for 1085 people, costing \$32,870,450. A small percentage ($n=66$) of those 1085 individuals received a 'Mental Health Inpatient' service from a provider other than a practitioner costing \$23,649,773. In other words, 6% of those receiving a mental health service accounted for almost three quarters of the total cost for all mental health services rendered. Physician non-specialty inpatient services also accounted for a large portion of the total cost at over \$18 million.

4. Discussion

A very limited number of published manuscripts have examined the service utilization and associated costs for HA at the individual service level (Bharell et al., 2013; Larimer et al., 2009; Lin, Bharel, Zhang, O'Connell, & Clark, 2015; Parker, Regier, Brown, & Davis, 2015). These data suggest an overrepresentation of minority groups compared to the corresponding proportion of the states total population. Although white HA represented the majority (74%), black HA comprised 20% of the total sample. Comparatively, according to census data, black race was identified by 3.6% of the total state population (StatesCensusBureau: Statistical Abstract of the United States, 2011). Generally, men tend to experience homelessness at a higher rate than women, however this sample had nearly equal numbers of men and women (~49%) ("The 2015 Annual Homeless Assessment Report to Congress," 2016). Also in contrast to national statistics, which estimates 89% of HA were between

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