

# BRIEF REPORT: The Aging of the Homeless Population: Fourteen-Year Trends in San Francisco

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**BACKGROUND:** Homelessness is associated with high rates of health and substance use problems.

**OBJECTIVE:** To examine trends in the age, housing, health status, health service utilization, and drug use of the homeless population over a 14-year period.

**DESIGN:** Serial cross-sectional.

**PARTICIPANTS:** We studied 3,534 literally homeless adults recruited at service providers in San Francisco in 4 waves: 1990–1994, 1996–1998, 1999–2000, and 2003.

**MEASUREMENTS:** Age, time homeless, self-reported chronic conditions, hospital and emergency department utilization, and drug and alcohol use.

**RESULTS:** The median age of the homeless increased from 37 to 46 over the study waves, at a rate of 0.66 years per calendar year ( $P < .01$ ). The median total time homeless increased from 12 to 39.5 months ( $P < .01$ ). Emergency department visits, hospital admissions, and chronic health conditions increased.

**CONCLUSIONS:** The homeless population is aging by about two thirds of a year every calendar year, consistent with trends in several other cities. It is likely that the homeless are static, aging population cohort. The aging trends suggest that chronic conditions will become increasingly prominent for homeless health services. This will present challenges to traditional approaches to screening, prevention, and treatment of chronic diseases in an aging homeless population.

**KEY WORDS:** homeless; aging; chronic health; health service utilization; substance use.

DOI: 10.1111/j.1525-1497.2006.00493.x

J GEN INTERN MED 2006; 21:775–778.

Homelessness is a chronic problem in the United States, affecting 2.3 to 3.5 million Americans annually.<sup>1</sup> Homelessness is associated with substance- and alcohol-related problems, mental illness, poor health, decreased access to ambulatory care, high rates of acute care, and high mortality.<sup>2–6</sup>

The homeless population has been changing over time. The current homeless population, compared with the homeless of the 1950s and 1960s, is poorer, in worse health, and less likely to be living indoors.<sup>7</sup> In recent years, the number of homeless people has increased, as have emergency shelter capacities and free meal programs.<sup>8,9</sup> One recent study examined 10-year homeless trends and found increases in age, the proportion of ethnic minorities, and substance use disorders.<sup>6</sup>

We examined trends in age, health, living situation, health services use, and substance use among literally homeless persons sampled at free meal programs and shelters in San Francisco over the past 14 years.

## METHODS

### Sampling Methods

We conducted 4 cross-sectional studies of adults (aged 18 and older) at homeless service providers in San Francisco, designed to obtain replicable, representative samples of the urban indigent.<sup>10</sup> Recruitment “waves” were 1990–1994, 1996–1998, 1999–2000, and 2003, waves 1–4, respectively, and were to estimate the prevalence of HIV and tuberculosis among the homeless (wave 1), and served as screening tools for a prospective study of tuberculosis prophylaxis (wave 2), and adherence to antiretroviral therapy among HIV positives (waves 3–4). Wave 1 used consecutive sampling within large shelters and a randomized sample of persons attending free meal programs.<sup>11</sup> Waves 2–4 employed multi-stage cluster sampling with stratification.<sup>12</sup> Each wave also sampled at single residency occupancy hotels (SROs), but the sampling strategy differed across waves. Sampling was conducted at a total of 8 free meal programs, 13 shelters, and 50 SROs. Participation rates in waves 1–4 were 70%, 67%, 70%, and 68%, respectively, with no difference in participation by sex or race.<sup>12</sup>

To maintain consistency, we restricted the current sample to individuals recruited from the shelters and meal programs sampled in 3 or more waves, and to persons who had been literally homeless in the prior year. Literal homelessness was defined as spending any night outdoors, in an emergency shelter, or in another place not meant for habitation.

In each wave we conducted interviews, and HIV counseling and antibody testing. All protocols were approved by the Institutional Review Board of the University of California, San Francisco. Only the first visit per individual per wave was included to give a cross-section at each time period. Actual sample sizes are reported when missing values exceed 1% of the sample.

### Analysis

We examined trends using the Mantel–Haentzel and Kruskal–Wallis tests. Because the waves were not equally spaced in time, we also performed regressions with the characteristic of interest as the dependent variable, and year of interview as the independent variable. Where confounding was observed, we

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None of the authors have any conflicts of interest to declare.

David Bangsberg and Andrew Moss obtained funding for the study.

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Manuscript received September 14, 2005

Initial editorial decision November 7, 2005

Final acceptance March 14, 2006

included the age-adjusted rather than the crude *P*-value in Table 1. To examine the robustness of our results, we examined the aging trend in three additional data subsets. We also conducted analyses weighted by the inverse of the duration literally homeless in the prior year to examine whether age trends were independent of the probability of being included in the sample.

## RESULTS

We performed 8,968 interviews overall, 6,104 at shelters and meal programs. Of these, 4,540 were at the selected meal programs and shelters, and 3,908 participants had been literally homeless in the prior year. We excluded 362 repeat interviews and 12 with missing date of birth for a sample size of 3,534.

The median age was 40 (IQR 33–46), and 1.2% were 65 and older. One quarter (22.9%) were women, 51.7% were African American, and 32.8% were white. Participants had spent a median 18 months (IQR 5–48) literally homeless and a median 3 years (IQR 1–8) since they were first literally homeless.

The median age increased significantly over the waves (Table 1), from 37 in wave 1 to 46 in wave 4. The proportion aged 50 and over increased from 11.2% to 17.7%, 19.5% and 32.3% in waves 1 to 4, respectively. The linear regression coefficient for the relationship between age and calendar year was 0.66 ( $P < .001$ ), i.e., average age increased by 0.66 years per calendar year. The median duration since first becoming homeless increased from 2 to 6 years; the average increased 0.40 years per calendar year by linear regression ( $P < .01$ ). The median total time literally homeless increased on average 2.7

Table 1. Demographic, Health, and Substance Use Characteristics by Study Wave

Characteristic	Wave 1 1990–1994 (n=1818)	Wave 2 1996–1997 (n=946)	Wave 3 1999–2000 (n=451)	Wave 4 2003 (n=319)	<i>P</i> -value for trend	<i>P</i> -value for regression*
<b>Demographics</b>						
Recruitment site = Shelter (%)	1,229 (67.6)	755 (79.8)	254 (56.3)	220 (69.0)	.30	.88
Median age (IQR)	37 (31–43)	41 (35–47)	42 (37–47)	46 (39–51)		< .001 <sup>†</sup>
Age > =50	204 (11.2)	167 (17.7)	88 (19.5)	103 (32.3)	< .001	
Sex = Female (%)	374 (20.6)	210 (22.3)	305 (32.2)	239 (25.1)	< .001	< .001
Race = White (%)	581 (32.0)	346 (36.7)	135 (30.0)	95 (30.2)	Ref	Ref
African American (%)	964 (53.0)	459 (48.7)	252 (56.0)	149 (47.3)	.87	.60
Other (%)	273 (15.0)	138 (14.6)	63 (14.0)	71 (22.5)	.06	.09
<b>Housing history</b>						
Median years since 1st literally homeless (IQR)	2 (0–5)	5 (1–11)	6 (2–12)	6 (2–13)		< .001 <sup>†</sup>
Median total months literally homeless (IQR)	12 (4–36)	24 (6–60)	30 (9–60)	39.5 (12–96)		< .001 <sup>†</sup>
<b>Housing, prior year</b>						
Lived outdoors (in street or car) (%)	654 (35.9)	380 (40.5)	202 (46.0)	153 (48.1)	< .001	< .001
Lived in own room, apartment, or house (%)	645 (35.5)	281 (29.9)	67 / 363 (18.5)	60 (18.9)	< .001	< .001
Lived in an SRO hotel (%)	680 (37.4)	514 (54.7)	245 (56.3)	131 (41.2)	< .001	< .001
Stayed in a shelter (among persons recruited at free meal programs) (%)	436/588 (74.1)	136/191 (71.2)	129/190 (67.9)	75/99 (75.7)	.44	.65
<b>Health status</b>						
Health status = poor (%)	159 (8.8)	91 (9.7)	40 (8.9)	—	.72	.91
Spent > =1 day lying down because of illness (%)	455 (25.7) <sup>‡</sup>	266 (28.5)	137 (30.4)	110 (35.0)	< .001	< .001
<b>Experienced problems in the past year with:</b>						
Heart disease (%)	—	52 (5.5)	26 (5.8)	18 (5.7)	.87	.97
Hypertension (%)	—	133 (14.1)	67 (14.9)	65 (20.6)	.01	.09 <sup>‡</sup>
Diabetes (%)	—	38 (4.0)	21 (4.7)	26 (8.2)	.006	.003
Emphysema (%)	—	28 (3.0)	11 (2.4)	18 (5.7)	.06	.04 <sup>‡</sup>
Asthma (%)	—	119 (12.6)	71 (15.7)	46 (14.6)	.22	.34
Any of the above conditions (%)	—	261 (27.6)	135 (29.9)	112 (35.1)	.01	.23 <sup>‡</sup>
HIV positive (%)	171/1807 (9.5)	73/931 (7.8)	45/451 (10.1)	21/319 (6.6)	.22	.23
<b>Health care utilization</b>						
Visited emergency department prior year (%)	—	410 (43.4)	190 (42.2)	165 (51.9)	.03	.01
Stayed overnight in hospital prior year (%)	—	202 (21.4)	95 (21.1)	97 (30.6)	.004	< .001
Mental health hospitalization prior year (%)	112 (6.2)	76 (8.1)	43 (9.6)	33 (10.3)	< .001	< .001
<b>Drug and alcohol use, prior 30 days</b>						
Heavy drinking** (%)	722 (40.3)	282 (30.2)	138 (31.0)	92 (28.8)	< .001	< .001
Injected drugs (%)	232 (12.9)	107 (11.9)	71 (15.9)	44 (13.8)	.28	.50
Used crack cocaine (%)	695 (38.4)	287 (30.6)	174 (38.8)	101 (32.1)	.04	.06

Statistical significance ( $P < .05$ ) is highlighted.

\*Logistic regression unless otherwise specified.

<sup>†</sup>*P*-value for linear regression.

<sup>‡</sup>Age-adjusted *P*-value for trend regression.

\*\*Defined as typically drinking 5 or more drinks (men) or 4 or more drinks (women) on a single occasion.

months per calendar year ( $P < .01$ ). Increasing proportions reported spending time ill and experiencing problems with hypertension and diabetes. The age-adjusted trend in hypertension was not statistically significant, indicating that the crude trend was because of the aging of the population. Increasing proportions of participants reported visiting an emergency department (ED) and being hospitalized for physical and mental health conditions in the prior year.

Heavy drinking decreased, while the proportion injecting drugs remained constant over the study period.

**Robustness of Aging Trends.** Shelters and meal programs sampled in fewer than 3 waves ( $N = 1,089$ ) showed increases in age of 0.55 years per calendar year ( $P < .001$ ). At a particular shelter and a meal program that served younger persons and families (median age = 34, IQR = 26–41,  $N = 389$ ), age increased by 0.92 years per calendar year ( $P < .001$ ) in waves 1–2. Age increased by 0.51 years per calendar year ( $P < .001$ ) among persons sampled in SRO hotels in waves 1–3 ( $N = 595$ ).

The aging trend persisted in an analysis weighted by time spent literally homeless in the prior year. The weighted median was 36 in wave 1 and 45 in wave 4 and age increased by 0.55 years per calendar year in regression analysis ( $P < .001$ ).

## DISCUSSION

The median age of the homeless in San Francisco increased 9 years over the 14-year period 1990–2003. In the most recent sample, one third were aged 50 or older. This aging rate far exceeds that in the general population, and is consistent with trends from 5 North American cities<sup>6,13–17</sup> (Fig. 1).

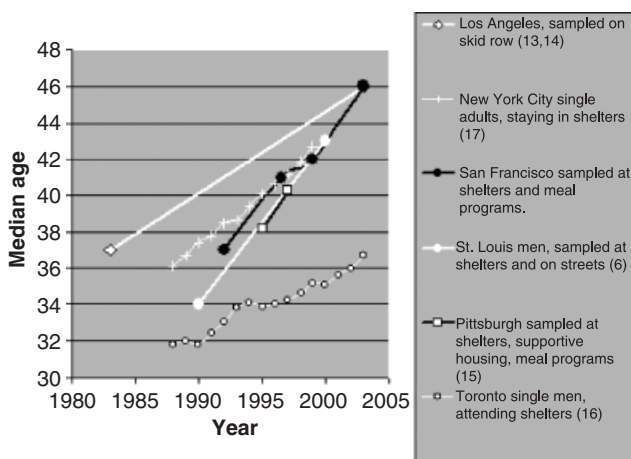
The aging trend suggests that the homeless population is primarily a static cohort. Homelessness itself became more chronic over time. If people become newly homeless and exit homelessness at a steady rate, we would expect the median duration homeless to remain constant. Instead, our trend data are consistent with a cohort effect beginning in the 1980s that may have been caused by an increase in population size, increasing drug use, and a lack of government response to such changes (D. Culhane, personal communication). Under the cohort model of homelessness, a one-time increase in support-

ive housing stock may have an important impact on homelessness.

There are several potential sources of bias in our study. Cross-sectional samples drawn at homeless service providers over-sample the chronically homeless and those using services.<sup>18</sup> In addition, it is unknown whether the sample was biased by refusals to participate, by limiting the sample to the literally homeless rather than including the near homeless, or by relying on self-reported data. These factors may affect the median age in our sample, but are unlikely to induce a spurious age trend.

The aging we observed may reflect provider changes or shifts in service utilization. However, the trend was robust: increases in age were also seen among users of shelters, meal programs, and SRO hotels not included in the main analysis. Moreover, similar findings have been noted in other cities. It is also possible that fewer newly homeless people were using the agencies we sampled. Homeless youth and homeless families, for example, do not use the same services as the chronically homeless.<sup>19</sup> However, samples from a shelter and a meal program that cater to families and young people also showed increasing age. Another possibility is that increasing imprisonment driven by mandatory drug sentencing<sup>20</sup> may have progressively removed young persons from the population. However, there is evidence from the largest meal program<sup>21</sup> and street and shelter counts<sup>22</sup> that the homeless population size may have been actually increasing over the study period. Early in the study period, there were decreases in the number of SRO units due to gentrification and fires, and supportive housing units began opening late in the study period. Supportive housing gives preference to older homeless persons; therefore, these changes may have masked a greater aging trend.

While substance use and mental health remain major medical issues for the homeless, the aging trends we observed suggest that chronic health conditions will take on increasing prominence for homeless health services as the population ages. A recent study reported that 85% of homeless persons over age 50 reported at least 1 chronic medical condition.<sup>23</sup> Homeless health care providers will increasingly need to grapple with how to manage their complex chronic conditions. New programs that integrate health care with more stable housing, such as supportive housing, may be important steps for avoiding end-stage disease and institutionalization in older homeless persons with complex medical regimens needing frequent office visits.



**FIGURE 1.** Aging trends among the homeless in 6 North American cities.

We would like to acknowledge the hard work of Richard Clark as Project Director, and the numerous field staff crucial to the success of this study.

**Funding:** This study was funded by NIH 5R01DA004363, 1R01MH054907, R01DA010164, K08HS11415, and The Doris Duke Charitable Foundation. All the work in this study was conducted independently of the NIH and the Doris Duke Charitable Foundation.

All protocols for this study were approved by the Institutional Review Board of the University of California, San Francisco.

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