Mortality Among Men Using Homeless Shelters in Toronto, Ontario

Stephen W. Hwang, MD, MPH

Homeless persons suffer from a high prevalence of physical disease, mental illness, and substance abuse.1-11 Homelessness is associated with exposure to the elements12 and an increased risk of infections such as tuberculosis and human immunodeficiency virus (HIV) disease.13-18 Among the homeless, access to health care is often suboptimal.19-23 Homeless persons also experience severe poverty and often come from disadvantaged minority communities, factors that are independently associated with poor health.24-29 The finding that mortality among homeless persons is much higher than among their counterparts in the general population is therefore not surprising.

Data on deaths among homeless people are available from a number of US cities. Early studies from Atlanta, Ga,30 and San Francisco, Calif,31 reported causes of death but not mortality rates. Three more recent studies have reported mortality rates in homeless populations. In Philadelphia, Pa, homeless adults had an age-adjusted mortality rate 3.5 times higher than that of the general population.32 In a study of clients of the Health Care for the Homeless Program in Boston, Mass, mortality rates were 5.9, 3.0, and 1.6 times higher than in the general population among men aged 18 to 24, 25 to 44, and 45 to 64 years, respectively.33 The leading causes of death were homicide among young men, the acquired immunodeficiency syndrome (AIDS) among 25- to 44-year-old men, and cancer and heart disease among older men. A study of homeless shelter users in New York City found age-adjusted death rates 2 to 3 times higher than the city’s general population.34 Mortality among older men and women of all ages was higher in New York City’s homeless population than in the Boston or Philadelphia homeless populations.

How do homeless persons fare in the United States compared with those in other developed Western countries? A cross-national comparison of mortality rates would shed light on how societal factors affect the health of marginalized segments of the population. However, little information is available on death rates among homeless persons outside the United States. A search of the literature reveals a single study conducted in Stockholm, Sweden, during 1969 through 1971.35 Among 6032 homeless men, 327 deaths occurred, during 1969 through 1971.35 Among 6032 homeless men, 327 deaths occurred...
occurred, corresponding to a standardized mortality ratio of 3.8; absolute mortality rates were not reported. High levels of excess mortality were observed due to accidents, poisonings, and violence. Comparisons of these findings with US data are difficult due to the lapse of more than 2 decades between the Swedish and US studies.

This study examines death rates among homeless men in Toronto, Ontario. We identified a cohort of 8933 men who used shelters in 1995 and ascertained the number and causes of deaths in this group for 1995 through 1997. Mortality rates for homeless men in Toronto are compared with rates previously reported in Boston, New York City, and Philadelphia.

**METHODS**

We compiled a database of men who used homeless shelters in Toronto in 1995 from various sources. The Toronto Hostel Services Division operates all public shelters in the city and contracts with all private nonprofit organizations that run full-time shelters. Both publicly and privately operated shelters provide the Toronto Hostel Services Division with a uniform dataset on every person admitted, and shelters receive per diem funding based on these reports. A few small church-run shelters that operate for only 1 night per week during the winter do not contribute to this dataset. Data on shelter admissions are compiled into a single master file that is audited by the Hostel Services Division. Each record includes a unique identifier permanently assigned to the shelter user (but not their full name), the person’s sex, date of birth, whether or not the person was accompanied by a spouse or children, the shelter site, and the dates of shelter admission and discharge.

We selected all records from the master file for men aged 18 years or older who stayed at homeless shelters in 1995. We excluded the small number of men accompanied by a spouse and/or children who were admitted to shelters for homeless families. The selected homeless men stayed at any of 10 homeless shelters with a maximum winter capacity of 1300 beds per night. We matched the unique identifiers from the master file to full names obtained from the registration records at each homeless shelter. Women were not included because registration records were not available at women’s shelters at the time this study was conducted. We compiled a database containing the names of 92% of the selected men in the 1995 master file, and this group forms the study population.

Persons who were homeless in 1995 but who lived on the street without ever using a shelter were not represented in the study population. Data are not available on the size of the street homeless population in Toronto relative to the shelter homeless population. However, a survey of homeless persons at daytime meal programs at drop-in centers in Toronto showed that 93% of these individuals had stayed at a homeless shelter within the last year (P. Goering, PhD, written communication, January 7, 2000).

The Ontario Office of the Registrar General ascertained deaths in the study population by comparing the shelter database with provincial death certificate records for 1995 through 1997. Matches were identified if the records agreed on (1) last name and exact date of birth or (2) first and last name and at least 2 of the following: day of birth, month of birth, and year of birth within 1 year. Names were compared using the Soundex algorithm to allow for minor differences in spelling. Matches were deemed correct if the first and last name and date of birth were exactly the same. Three reviewers examined all other potential matches and reached a consensus as to whether the match was correct.

Person-years of observation in the cohort were calculated as follows. We determined that a single individual could be represented by more than 1 identifier in the master file if he spelled his name differently or gave a different date of birth at separate shelter admissions. Duplicate identifiers related to a single individual were combined into a single identifier, using methods developed for this purpose in a previous study of mortality among homeless shelter users. We then calculated person-years of observation for each individual, with the period of observation defined as the time from first shelter admission in 1995 through December 31, 1997, or, in the case of decedents, their date of death. Total person-years of observation in the homeless cohort were calculated by age groups, with age determined at first shelter admission.

We calculated age- and cause-specific mortality rates (deaths per 100,000 person-years of observation). Causes of death were obtained from death certificates, as coded by the Office of the Registrar General according to the International Classification of Diseases, Ninth Revision (ICD-9). We calculated rate ratios by dividing the mortality rate among shelter users by the corresponding mortality rate for men in the general population of Toronto in 1995. These values were not adjusted for race, because neither the race of homeless men in the master file nor race-specific mortality rates for the general population of Toronto were available. We determined the 95% confidence intervals (CIs) for rates and rate ratios using standard techniques.

We compared mortality rates among homeless men in Toronto with mortality rates reported in studies of homeless men in Boston,33 New York City,34 and Philadelphia.32 The Boston study examined mortality among 11,745 men, almost all of whom were shelter residents, who had contact with a Health Care for the Homeless Program during 1988 through 1993.33 The New York City study reported mortality rates in a representative sample of 949 homeless male shelter residents in 1987 through 1994.30 The Philadelphia study, conducted from 1985 through 1988, involved 6378 men who were homeless shelter users or street-dwelling homeless persons who had contact with a team of outreach workers.32

Because blacks and Hispanics account for a larger proportion of the homeless population in US cities than in Toronto, mortality rates were adjusted for race.
Table 1. Characteristics of Men Using Homeless Shelters in Toronto (N = 8933)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>No. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, y</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>36.1</td>
</tr>
<tr>
<td>18-24</td>
<td>1046 (12)</td>
</tr>
<tr>
<td>25-44</td>
<td>6143 (69)</td>
</tr>
<tr>
<td>45-64</td>
<td>1580 (18)</td>
</tr>
<tr>
<td>65+</td>
<td>164 (2)</td>
</tr>
<tr>
<td>Total homeless shelter use in 1995, d</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>24</td>
</tr>
<tr>
<td>1-7</td>
<td>4437 (50)</td>
</tr>
<tr>
<td>8-14</td>
<td>1148 (12)</td>
</tr>
<tr>
<td>15-30</td>
<td>1366 (15)</td>
</tr>
<tr>
<td>31-60</td>
<td>1031 (12)</td>
</tr>
<tr>
<td>61-120</td>
<td>637 (7)</td>
</tr>
<tr>
<td>121-365</td>
<td>314 (4)</td>
</tr>
<tr>
<td>Mean duration of follow-up, y</td>
<td>2.6</td>
</tr>
</tbody>
</table>

Table 2. Mortality Rates of Men Using Homeless Shelters in Toronto and Rate Ratios Comparing Mortality Rates Among Homeless Men With Those of Men in the General Population of Toronto*

<table>
<thead>
<tr>
<th>Cause of Death</th>
<th>Age 18-24 y</th>
<th></th>
<th>Age 25-44 y</th>
<th></th>
<th>Age 45-64 y</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mortality Rate</td>
<td>Rate Ratio (95% CI)</td>
<td>Mortality Rate</td>
<td>Rate Ratio (95% CI)</td>
<td>Mortality Rate</td>
<td>Rate Ratio (95% CI)</td>
</tr>
<tr>
<td>AIDS</td>
<td>...</td>
<td>...</td>
<td>114.8</td>
<td>1.7 (1.1-2.8)</td>
<td>75.2</td>
<td>1.5 (0.5-4.9)</td>
</tr>
<tr>
<td>Cancer</td>
<td>...</td>
<td>...</td>
<td>19.1</td>
<td>1.0 (0.3-3.1)</td>
<td>225.7</td>
<td>0.9 (0.4-1.7)</td>
</tr>
<tr>
<td>Heart disease</td>
<td>...</td>
<td>...</td>
<td>25.5</td>
<td>2.4 (0.9-6.6)</td>
<td>200.6</td>
<td>1.4 (0.7-2.9)</td>
</tr>
<tr>
<td>Cerebrovascular disease</td>
<td>...</td>
<td>...</td>
<td>6.4</td>
<td>2.9 (0.4-22.8)</td>
<td>125.4</td>
<td>4.9 (2.0-12.3)</td>
</tr>
<tr>
<td>Pneumonia and influenza</td>
<td>...</td>
<td>...</td>
<td>12.8</td>
<td>13.0 (2.4-71.1)</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Chronic liver disease</td>
<td>...</td>
<td>...</td>
<td>19.1</td>
<td>6.5 (1.8-23.1)</td>
<td>25.1</td>
<td>0.8 (0.1-5.5)</td>
</tr>
<tr>
<td>Struck by motor vehicle</td>
<td>...</td>
<td>...</td>
<td>25.5</td>
<td>3.1 (1.1-8.6)</td>
<td>25.1</td>
<td>4.6 (0.6-35.4)</td>
</tr>
<tr>
<td>Unintentional poisonings</td>
<td>76.6</td>
<td>113.2 (10.3-1249.0)</td>
<td>102.0</td>
<td>14.4 (7.8-26.4)</td>
<td>50.2</td>
<td>10.0 (2.2-44.8)</td>
</tr>
<tr>
<td>Other accidents</td>
<td>114.9</td>
<td>24.3 (6.3-93.8)</td>
<td>57.4</td>
<td>9.0 (4.2-19.2)</td>
<td>125.4</td>
<td>16.7 (6.2-46.1)</td>
</tr>
<tr>
<td>Suicide</td>
<td>76.6</td>
<td>10.3 (2.3-46.4)</td>
<td>57.4</td>
<td>3.1 (1.6-6.2)</td>
<td>50.2</td>
<td>2.8 (0.7-11.6)</td>
</tr>
<tr>
<td>Homicide</td>
<td>38.3</td>
<td>9.4 (1.1-78.4)</td>
<td>19.1</td>
<td>7.1 (2.0-25.5)</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Unknown or unspecified</td>
<td>76.6</td>
<td>9.4 (2.1-42.2)</td>
<td>133.9</td>
<td>10.7 (6.4-17.8)</td>
<td>376.1</td>
<td>11.2 (8.4-19.3)</td>
</tr>
<tr>
<td>Total</td>
<td>421.4</td>
<td>8.3 (4.4-15.6)</td>
<td>669.4</td>
<td>3.7 (3.0-4.6)</td>
<td>1680.1</td>
<td>2.3 (1.8-3.0)</td>
</tr>
</tbody>
</table>

* Mortality rates are expressed as deaths per 100 000 person-years. CI indicates confidence interval; AIDS, acquired immunodeficiency syndrome. Ellipses indicate that no deaths due to this cause were observed among homeless men.

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through the following standardization. We estimated the racial composition of Toronto’s homeless population using data from the Mental Illness and Pathways into Homelessness Study, a random sample of 300 shelter users in Toronto in 1995 through 1997, stratified by age, sex, and intensity of shelter use. Male shelter users were 76% white and 24% nonwhite (specifically, 13% black, 6% Native Indian, and 5% other races) (P. Goering, PhD, written communication, January 5, 1999). Total mortality rates for homeless men in Boston, New York City, and Philadelphia were adjusted for race by direct standardization, using homeless men in Toronto as the standard population. Race-specific mortal-

Table 2. Mortality Rates of Men Using Homeless Shelters in Toronto and Rate Ratios Comparing Mortality Rates Among Homeless Men With Those of Men in the General Population of Toronto

The study population consisted of 8933 men who stayed at homeless shelters in Toronto in 1995. Characteristics of the cohort are shown in Table 1. We identified 201 deaths in the cohort during 22958 person-years of observation, for a crude mortality rate of 876 per 100 000 person-years. The mean age at death was 46 years (range, 20-84 years). Death occurred outside a hospital in 41% of deaths, but the location was not otherwise specified. Deaths were relatively evenly distributed across months of the year; in particular, the number of deaths did not increase significantly during winter months. The coroner’s office performed an autopsy on 57% of the decedents.

Age- and cause-specific mortality rates and rate ratios comparing mortality in the shelter population with that of the general population of Toronto are shown in Table 2. For almost all causes of death, rate ratios significantly exceeded 1. For total mortality, rate ratios were 8.3 among 18- to 24-year-olds (95% CI, 4.4-15.6), 3.7 among 25- to 44-year-olds (95% CI, 3.0-4.6), and 2.3 among 45- to 64-year-olds (95% CI, 1.8-3.0). Thus, younger homeless men...
are at greater relative disadvantage, despite the fact that older homeless men have higher absolute mortality rates.

The leading identified causes of death among men 18 to 24 years old using shelters in Toronto were accidents (other than poisonings), poisonings, and suicides. Among men 25 to 44 years old, AIDS, accidents (other than poisonings), poisonings, and suicide were the most common causes. The most frequently identified mechanisms of traumatic accidental death were falls from stairways or buildings and being struck by a motor vehicle, streetcar, or train. Poisoning deaths included unintentional overdoses of opiates, other drugs, or alcohol. Among men aged 45 to 64 years, the main identified causes of death shifted to cancer, heart disease, and cerebrovascular disease, although accidental deaths (other than poisonings) remained common.

These patterns of causes of death are similar to those reported among homeless men in Boston, with 2 exceptions.33 Homicide was not among the 3 leading causes of death for men aged 18 to 24 years using shelters in Toronto, but was the most common cause of death in this age group in Boston. Mortality rates due to homicide in these cities were 38 and 243 per 100 000 person-years, respectively (rate ratio, 0.2; 95% CI, 0.02-1.4). The proportion of homicides involving firearms was 0% in Toronto and 13% in Boston. While AIDS was a leading cause of death among men aged 25 to 44 years in both cities, mortality rates due to AIDS were significantly lower in Toronto than in Boston (115 vs 337 per 100 000 person-years, respectively; rate ratio, 0.3; 95% CI, 0.2-0.6).

Total mortality rates among men who use homeless shelters in Toronto are generally lower than race-adjusted mortality rates among homeless men in Boston, New York City, and Philadelphia (TABLE 3). The FIGURE shows the rate ratios and 95% CIs for these comparisons. A disparity is particularly prominent in the middle age group, with mortality rates 40% to 60% lower in Toronto compared with US cities. Crude mortality rates (not adjusted for race) for these comparisons yield similar results (data not shown).

We examined the extent to which deaths due to AIDS and homicide accounted for the disparity in mortality rates between Toronto and Boston. After excluding all deaths from AIDS, rate ratios comparing mortality in Toronto with Boston increased only slightly. Rate ratios rose to 0.78 (95% CI, 0.33-1.83) for 18- to 24-year-olds, 0.58 (95% CI, 0.45-0.75) for 25- to 44-year-olds, and 0.76 (95% CI, 0.57-1.00) for 45- to 64-year-olds. Thus, lower rates of HIV infection and recent therapeutic advances for this condition can account for only a small proportion of the overall mortality advantage for shelter users in Toronto. When deaths from homicide were excluded, the mortality rate ratio for men aged 18 to 24 years in Toronto compared with Boston rose from 0.75 (95% CI, 0.32-1.75) to 1.51 (95% CI, 0.50-4.53). Both CIs include 1, and the rate ratios are not significantly different. For men aged 25 to 44

### Table 3. Mortality Rates and Person-Years of Observation Among Men Using Homeless Shelters in Toronto and US Cities

<table>
<thead>
<tr>
<th>Age Range, y</th>
<th>Toronto</th>
<th>Boston†</th>
<th>New York‡</th>
<th>Philadelphia§</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-24</td>
<td>Mortality rate</td>
<td>421</td>
<td>563</td>
<td>1392</td>
</tr>
<tr>
<td>Person-years of observation</td>
<td>2610</td>
<td>1851</td>
<td>292</td>
<td>...</td>
</tr>
<tr>
<td>25-44</td>
<td>Mortality rate</td>
<td>669</td>
<td>1298</td>
<td>1089</td>
</tr>
<tr>
<td>Person-years of observation</td>
<td>15687</td>
<td>21839</td>
<td>5080</td>
<td>...</td>
</tr>
<tr>
<td>45-64</td>
<td>Mortality rate</td>
<td>1680</td>
<td>2227</td>
<td>3048</td>
</tr>
<tr>
<td>Person-years of observation</td>
<td>3988</td>
<td>9582</td>
<td>1720</td>
<td>...</td>
</tr>
<tr>
<td>15-34</td>
<td>Mortality rate</td>
<td>508</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Person-years of observation</td>
<td>11618</td>
<td>...</td>
<td>...</td>
<td>1881</td>
</tr>
<tr>
<td>35-54</td>
<td>Mortality rate</td>
<td>963</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Person-years of observation</td>
<td>9661</td>
<td>...</td>
<td>...</td>
<td>1085</td>
</tr>
<tr>
<td>55-74</td>
<td>Mortality rate</td>
<td>3238</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Person-years of observation</td>
<td>1452</td>
<td>...</td>
<td>...</td>
<td>185</td>
</tr>
</tbody>
</table>

*Mortality rates are expressed as deaths per 100 000 person-years. Mortality rates in US cities are adjusted for race by standardization using homeless men in Toronto as the standard population (see “Methods” for details). Ellipses indicate data not applicable.
†Data from Hwang et al.33
‡Data from Barrow et al.34
§Data from Hibbs et al.32
years, the rate ratio remained un-
changed at 0.52 (95% CI, 0.41-0.65),
and for men aged 45 to 64 years it
increased minimally to 0.78 (95% CI,
0.59-1.03). Therefore, the fact that ho-
micide rates were higher in Boston than
Toronto did not account for the over-
all mortality advantage for homeless
men in Toronto, particularly for men
older than 25 years.

**COMMENT**

Men who use homeless shelters in
Toronto experience significant excess
mortality compared with the city’s gen-
eral population. This finding is consist-
tent with previous studies of homeless
persons in major US cities.32-34 Indeed, rate
tios comparing mortality among
homeless men with that of the general
population are remarkably similar in
Toronto (8.3, 3.7, and 2.3) and Boston
(5.9, 3.0, and 1.6) for young, middle, and
older age groups, respectively.35

Because many deaths among men who
used homeless shelters in Toronto were
attributed to unknown or unspecified
causes, detailed analyses of cause-
specific death rates must be ap-
proached with caution. Despite this limi-
tation, we note 2 causes for which
mortality rates are far lower among
homeless men in Toronto compared with
Boston: homicide among men aged 18
to 24 years and AIDS among men aged
25 to 44 years. These differences persist
even if all of the deaths due to un-
known or unspecified causes in Toronto
are attributed to homicide (in the case of
18- to 24-year-olds) or AIDS (in the
case of 25- to 44-year-olds).36

The most striking finding of this study
is that men who use homeless shelters in
Toronto had total mortality rates much
lower than the corresponding rates re-
ported among homeless men in Boston,
New York City, and Philadelphia. This
disparity is consistent across cities and
age groups and is most significant in the
middle age range, which includes about
half of all homeless men in the United
States.37 Differences in mortality rates
could potentially be explained by varia-
tions in how each homeless cohort was
defined. Specifically, the Toronto co-
hort was limited to shelter users; mor-
tality in the US cohorts might appear
higher if they included significant num-
bers of street-dwelling homeless people,
who presumably have higher mortality
rates than homeless people who use shel-
ters. This may have been a factor in the
Philadelphia study, which included a
number of individuals living on the
street. The New York City cohort, how-
ever, consisted of a sample of homeless
shelter residents. The Boston cohort was
made up of men who had contact with a
Health Care for the Homeless Pro-
mogram, almost all of whom were residing
at homeless shelters. While a group of
health service users might have higher
morbidity and mortality than the gen-
eral shelter population,46 contact with the
health care system could also result in
lower mortality rates. In fact, death rates
in the Boston cohort were comparable to
or lower than death rates in the general
shelter population in New York City. Of
note, the only instance in which death
rates were higher in Toronto was for the
comparison against Philadelphia for men
aged 55 to 74 years. This finding may be
related to the fact that the mortality rate
among older homeless men in Philadel-
phia was based on a very small number
of observations and may represent an
underestimate of the true rate.

Why are death rates among men who
use homeless shelters lower in Toronto
than in US cities? Men entering the shel-
ter system in Toronto may have fewer
baseline comorbidities. Previous stud-
ies have shown that risk factors for death
among homeless people include med-
cal conditions such as renal disease, liver
disease, arrhythmias, and seizures.43
Other risk factors include injection drug
use and a history of incarceration.44 Shel-
ter users in Toronto may have a lower
prevalence of these risk factors, par-
cularly injection drug use.44

The events that transpire after an
individual becomes homeless can also
have important effects on mortality.
Preliminary analyses of patterns of shelter
use in our cohort reveal that men
who use shelters in Toronto are less likely
to have prolonged episodes of homeless-
ness than persons using shelters in New
York City and Philadelphia.45 Because
chronic homelessness itself may in-
crease the risk of death,44 this differ-
ence may contribute to lower mortality
among shelter users in Toronto. An-
other factor is the dramatically lower in-
cidence of homicide in Canada46 com-
pared with the United States,37 an
advantage that extends to homeless per-
sons as well as the general population.

Canada’s system of universal health in-
surance may have contributed to lower
death rates among shelter users in
Toronto. Whereas most homeless per-
sons in the United States lack health in-
surance,47 homeless persons in Canada
do not encounter any financial barriers
to obtaining health care services. Stud-
ies have shown that low-income per-
sons in Canada receive more physician
services than their US counterparts.48
Survival rates among low-income pa-
tients with cancer are higher in Canada
than the United States, a disparity that
has been attributed to better access to
health care in Canada.49 With respect to
mental health services, residents of On-
tario with a perceived need for help are
more likely to receive care than compa-
rable individuals in the United States.49
In view of the consistency of these find-
ings, a beneficial effect of the Canadian
health care system on mortality among
homeless men would not be surprising.

This study has certain limitations.
Homeless women were not studied due
to restrictions in data sources. We used
death certificates to obtain causes of
death. The accuracy of death certificate
data has been questioned, as significant
discrepancies have been found be-
tween death certificates and autopsy re-
ports.50 Other studies have shown that
death certificates reliably document
deaths due to coronary heart disease.51
AIDS,52 and injuries.53 Because many
deaths in this cohort were attributed to
unknown or unspecified causes, cause-
specific death rates should be inter-
preted with caution; however, this limi-
tation does not affect analyses of total
mortality rates. Death rates among home-
less people in various cities were com-
pared using data obtained over differ-
ent time periods. However, the major
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potential confounding factors in such an analysis have been discussed and are unlikely to be responsible for the consistent mortality advantage for the shelter population in Toronto.

In conclusion, this study demonstrates that mortality rates among men who use homeless shelters in Toronto, while higher than in the general population of Toronto, are dramatically lower than mortality rates previously observed among homeless men in Boston, New York City, or Philadelphia. Further investigations are needed to identify the reasons for this disparity. Possible contributory factors include the effects of universal health insurance and access to health care in Canada, lower homicide rates, particularly among young men, and the differential health effects of short-term vs chronic homelessness. Insights into the reasons behind lower mortality among homeless men in Toronto could help direct efforts to reduce deaths among homeless persons and other disadvantaged populations in the United States.

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Disclaimer: The results and conclusions are those of the author, and no official endorsement by the Ontario Ministry of Health is intended or should be inferred.

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REFERENCES


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