

Premature Mortality
in Homeless Populations:
A Review of the Literature

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Table of Contents

Introduction	1
I. Early Epidemiological and Mapping Studies	
“The Lodging House Effect”	1
Zones of Excess Mortality, the “Death Zones”	1
II. Reports from the Offices of the Medical Examiner	
Atlanta	2
San Francisco	3
III. Toward Standard Mortality Ratios	
Stockholm	4
Philadelphia	5
Boston	6
New York	7
Toronto	8
Copenhagen	9
IV. Studies of Sub-Groups of Homeless Persons	
Homeless Persons with Schizophrenia in Sydney, Australia	10
Mentally Ill Homeless Veterans in the United States	11
Street Youth in Montreal, Canada	11
Homeless Persons with HIV/AIDS in San Francisco	11
V. The Street Population	12
VI. Summary	13
References	15

Introduction

The literature of the past century and a half abounds with studies that depict the dire health consequences of poverty and socioeconomic deprivation. John Snow began the modern era of epidemiology and public health through his meticulous investigation of London's deadly cholera outbreak during 1848–54. Many deaths clustered in the vicinity of the Broad Street water pump, and the cause of the epidemic was traced to the water supply. This landmark study helped eradicate a deadly plague and remains a prototype for the improvement of health and prevention of death through epidemiological studies. The noted Boston physician and leading public health advocate, Lemuel Shattuck, studied the *Report of the Sanitary Commission of Massachusetts, 1850*, and found that Boston had mortality rates comparable to those of London, whose citizens had an average life expectancy eight years shorter than the overall population of England.¹

This paper reviews major studies in the current literature that have examined the association between homelessness and mortality, including mapping studies in the 1970s, a number of reports from the Medical Examiner's Office of several cities in the 1980s, and cohort studies in the past 15 years in major cities that seek to assess mortality rates and standard mortality ratios for homeless persons. Finally, mortality among various sub-groups of the homeless population is reviewed. Despite unearthing the need for more substantial investigation, these studies provide valuable insight for clinicians and policy makers seeking ways to prevent deaths among our poorest and most vulnerable neighbors.

I. Early Epidemiological and Mapping Studies

“The Lodging House Effect”

Mould and colleagues investigated an increase in mortality due to lung cancer in Liverpool, England. Everton, one of the four wards in Liverpool, was found to have twice as many deaths from lung cancer as the other three wards despite no essential difference in social class or occupation. A cluster of deaths was found in a 200-bed common lodging house, which accounted for the excess mortality and was termed “the lodging house effect” by the authors.²

Zones of Excess Mortality, the “Death Zones”

Three-dimensional computer mapping of mortality statistics in census tracts in Los Angeles County in 1969–71 found three times greater mortality in the depressed area of Watts and the skid row areas of Los Angeles and Long Beach than elsewhere in the county.³

An analysis of all deaths occurring in Massachusetts during 1972 and 1973 revealed that one district in Boston had the highest number of deaths and the greatest excess mortality in the Commonwealth. The social ecology of this “zone of excess mortality” included severe poverty, poor housing with marked overcrowding and homelessness, personal disability and social isolation. The authors of this study noted that 652 more deaths occurred in this small area than would be expected by statewide mortality rates. This number exceeded the number of deaths occurring in places the United States government had declared “natural disaster areas.” Having identified these environmental “death zones,” the authors conclude “the intensity and complexity of the problem require a comprehensive economic, educational, environmental and social program to provide basic movement to a long-term solution.”⁴

In the ensuing three decades since the identification of these “death zones,” a number of national and international studies have underscored the disturbing and complex association between homelessness and early death. In this review we will examine the body of literature that details this tragic health care disparity that haunts our collective conscience and brings untold suffering and pain into the lives of our neighbors who struggle to survive without safe and affordable housing.

II. Reports from the Offices of the Medical Examiner

Atlanta

The Office of the Fulton County Medical Examiner found 40 deaths among homeless adults in Atlanta in a review of the 2,380 deaths reported in a one-year period from July 1985 through June 1986. 37 men and 3 women comprised the decedents, with an age range from 21-70 and a median age of 44 years old. The causes of these deaths were classified as either natural or external. Natural deaths are due to disease or the normal aging process. Sixteen (40%) deaths were natural: 6 due to chronic alcohol abuse, 3 to seizures, 4 to heart disease, and 3 to lung disease. External causes of death are related to injury or drug ingestion and can be unintentional accidents or intentional deaths due to suicide or homicide. Of the 24 (60%) of deaths due to external causes, 19 (48%) were classified as unintentional accidents, with 7 due to acute alcohol intoxication and 12 to injuries such as fire, hypothermia, motor vehicle accidents, drowning, and falls. The remaining 5 deaths included four homicides and one suicide. The Medical Examiner (ME) determined that 28 (70%) of the 40 deaths were related to alcohol.⁵

A subsequent report by The Fulton County Medical Examiner’s Office investigated 128 homeless deaths in the three-year period from 1988 through 1990 and found similar results. The average age of death was 46 years old and almost all of the decedents (125) were men. The ethnicity of those who died reflected that of the general population of Atlanta. Fifty-five per-

cent of the deaths were due to natural causes and 42% resulted from external causes, including 10 homicides, 4 suicides, and 3 undetermined. Just over half of the deaths occurred outdoors. Sixty (47%) of the 128 deaths were related to acute and chronic alcoholism. The use of drugs other than alcohol was relatively rare: opiates were not detected in any of the 101 tested, and only 13 of 103 decedents tested positive for cocaine.⁶

Many studies have used the Medical Examiner's Office, although these studies often miss homeless persons who die outside of the city or county limits, and can underestimate the number of homeless persons whose deaths in hospitals or other health care facilities may not necessarily be reported to the ME. The Atlanta studies cited above engendered a fierce debate over the number of homeless deaths that occurred in Fulton County. While the ME found an average of 40 deaths per year, shelter information from Atlanta identified 188 deaths during 1991.

Emory University and the Centers for Disease Control attempted to reconcile this discrepancy with the Atlanta Coalition for the Homeless. Fulton County death certificates confirmed only 37 (20%) of the 188 homeless deaths reported by the shelters. Of those 37 deaths, only 6 had not previously been reported to the ME. Official records in Fulton County were unable to find evidence of the remaining deaths, many of which may have occurred outside of the county.⁷ This tension persists throughout the country, and the need for improved methodology for reporting and classifying the deaths of homeless persons remains paramount.

San Francisco

In San Francisco, the Health Care for the Homeless Program and the San Francisco Department of Public Health reviewed the records of homeless deaths reported to the ME's office from a six-year period from 1985 through 1990. 644 deaths were identified, of whom 567 (88%) were men. The ethnicity reflected the city's overall population, and the average age at death was 41 years. The location of death varied: 225 (35%) on the streets; 155 (24%) in an emergency room or a hospital; 135 (21%) in abandoned buildings; 90 (14%) in an SRO in which they lived; 32 (5%) in cars or trucks they used as homes; and 7 (1%) undetermined.

The ME classified 254 (39%) of the deaths as natural and 333 (53%) as external, including 216 (34%) from unintentional injuries and 117 from intentional injuries. These intentional injuries included 81 (13%) homicides and 36 (6%) suicides. 57 (9%) of the deaths were from undetermined causes. One-third of the decedents were legally intoxicated from alcohol at the time of death, and either drugs or alcohol were detected in 503 (78%) of those who died. During the six-year period from 1985 to 1990, the detection of drugs other than alcohol increased significantly in those who died, with morphine from 19% to 21%, cocaine from 4% to 14%, and amphetamines from 4% to 8%.⁸

The patterns of death in Atlanta and San Francisco were very similar in the studies noted above, with the exception of unintentional injuries. Atlanta reported almost half of the deaths due to unintentional injuries, while San Francisco found only about a third of the deaths due to such injuries.

Atlanta and San Francisco provided early reports on homeless deaths in those communities, and both utilized ME data. The ME is responsible for investigating all deaths due to external causes (intentional and unintentional injuries or accidents) as well as for any unattended deaths due to natural causes. The two major limitations to such an approach are the failure to document deaths that occur outside of the geographic jurisdiction of the city or county ME and the tendency to miss the deaths of homeless persons who die of natural causes in hospitals or other health care facilities. A further limitation of these early ME reports is the inability to calculate standard mortality ratios, which require an estimate of the size of the homeless population during a given time period in each of those cities.

III. Toward Standard Mortality Ratios

These early studies underscored a major challenge for research in the causes of death and mortality patterns in homeless populations. The risk for death among homeless persons when compared to the general population depends on the calculation of standard mortality ratios (SMR). An SMR of 1.0 means that homeless persons have the same risk of dying as the general population; greater than 1.0 indicates a higher risk of dying, and less than 1.0 indicates a reduced risk of death. In addition to the population of a given city or county as well as the number and causes of death, the calculation of the SMR for homeless persons requires two critical factors. The numerator is an accurate count of the number of homeless deaths per year, and the denominator is a reasonable estimate of the size of the homeless population in a given city or county.

Stockholm

One of the first studies of mortality among homeless persons was published by Alstrom and colleagues in the *British Journal of Addiction* in 1975. Stockholm, Sweden, had a population of 700,000 in 1970, with approximately 3,500 adult men listed in the “Bureau for Homeless Men.” The cohort included 6,032 men registered in this Bureau during the three-year period from 1969–1971, and comparison with the national death registry in Sweden during that period found 327 deaths among the homeless cohort. This represents a mortality rate ratio of 4 times that of the Swedish population. The ratio of observed to expected deaths was increased in every age category: 9 for ages 20–39; 7 for ages 40–49; 4 for ages 50–59; 3 for ages over 60.

Autopsy reports were used to determine the cause of death. Accidents, poisonings, and violence accounted for 53 (16%) of the deaths, with another 25 (8%) deaths due to suicide. Acute and chronic medical conditions, including heart disease, cirrhosis, cancer, and pulmonary problems, accounted for 211 (65%) of the deaths.

The authors noted that this cohort included men who had been homeless for many years, and that alcohol was the “most important reason behind the downhill course.”⁹

Philadelphia

Hibbs and colleagues published the first data on mortality in a well-defined cohort of homeless persons in American in 1994. Homeless adults in Philadelphia were found to have an age-adjusted mortality rate of almost four times that of the city’s general population. This landmark study followed 6308 homeless persons 15–74 years of age who used the homeless services of that city in the four-year period from 1985 through 1988. The authors matched this cohort with a database of all deaths in Philadelphia and found 96 deaths in the homeless cohort. The crude mortality rate was 7.7 deaths per 1000 person years of observation, and the age-adjusted annual mortality rate was 3.5 times higher (95% confidence interval, 2.8–4.5) than for the general population of Philadelphia.

The causes of death for almost three-quarters of the cohort were injuries, heart disease, liver disease, poisoning, and ill-defined conditions. The highest difference in mortality rates was found among white men and the lowest among nonwhite men. The authors also calculated an age-adjusted number of years of potential life lost before the age of 75, and found that homeless persons lost 3.6 times more years than the general population (345 years as compared to 97 years lost per 1000 person-years of observation).

Other interesting findings in this study resonated with the experiences of clinicians caring for homeless persons across the country. Over half of the deaths (53%) occurred during the warmer months of June through September, indicating that the risk of dying was equal in cold and warm weather. Over one quarter of the deaths (27%) occurred on Sundays, a phenomenon also noted in Boston and thought due to that city’s “Blue Laws” which prohibit the sale of alcohol on Sundays. In contrast to the Atlanta and San Francisco studies, substance abuse did not appear to explain the excess mortality in this cohort, as even those homeless persons with mental health issues but no history of substance abuse had a threefold increase in mortality when compared to Philadelphia’s general population.¹⁰

Boston

Hwang and his colleagues examined deaths among 17,292 adults seen by the Boston Health Care for the Homeless Program (BHCHP) from July 1, 1988 through December 31, 1993. 68% of the cohort was male, and the ethnicity was similar to Boston's general population. This cohort was observed for over 50,000 person-years, with an average of 2.9 years of observation per person. This BHCHP database was matched with the Massachusetts death registry, resulting in 606 decedents. The average age of death was 47 years, with a median age of 44 years.

The authors examined cause-specific mortality rates by age groups. Homicide was the leading cause of death in the 18–24 age group and in women 25–44 years of age, AIDS in the 25–44 age group, and heart disease and cancer in the older group from 45–64 years of age. Traumatic injury and poisoning were the second most common causes of death in men 18–24 and 25–44 years of age. An overdose of alcohol or drugs accounted for 6% of the total deaths in the cohort. Heart disease was a major cause of death in the 45–64 age group, and death from heart disease was three times higher in homeless men 24–45 years of age than in the general population. The authors note that certain conditions often associated with homelessness were not common causes of death in this cohort; 4 deaths were due to hypothermia and only one death was due to tuberculosis.

The number of deaths did not vary with the seasons, confirming findings in the previous studies in Atlanta and San Francisco and Philadelphia. The crude mortality rate of this cohort of homeless persons 18–64 years of age was 1114 per 100,000 person-years observed. This is strikingly similar to the 1035 per 100,000 person-years observed in the Philadelphia cohort of homeless persons aged 15–75 years.¹¹

The major limitation of the Boston study was that the cohort of homeless persons identified included only those who had contact with the clinics of the Boston Health Care for the Homeless Program. Homeless persons who did not seek health care in BHCHP's three hospital clinics and 40 shelter clinics were not included in the cohort.

A follow-up study by these authors attempted to identify the risks factors for premature death in this cohort. In a case-control study, 558 homeless adults who died during 1988–1993 were matched with homeless persons of similar age who had been seen by BHCHP during that period but were still alive in 1993. A blinded review of the medical charts of cases and controls was undertaken, and the odds ratios for death were determined through regression analysis models.

The odds ratio for AIDS was 55.8, renal disease 18.4, liver disease 3.8, arrhythmia 3.3. Homeless persons with a history of frostbite, immersion foot, or hypothermia in their medical records had an eightfold risk of dying when compared to matched homeless controls. While frostbite and immersion foot rarely are the cause of death, this finding in the medical chart likely indicates a very vulnerable person. Finally, mental health and substance abuse were not as strongly associated with death as were medical illnesses. A history of alcohol or injection drug had odds ratio of 1.5 and 1.6, increasing the risk of death moderately.¹²

This study was conducted before the initiation of highly active anti-retroviral therapy for AIDS, and the odds ratio was 17.7 for symptomatic HIV infection and 4.1 for asymptomatic HIV infection. These latter two results are particularly revealing, and helped explain the results of an earlier BHCHP study. This retrospective cohort study of 72 homeless persons diagnosed with AIDS between 1983 and 1991 found no difference in their survival rates when compared to 1,536 non-homeless Boston residents.

The authors had hypothesized that homeless persons living with AIDS in the shelters and on the streets would be more vulnerable to communicable diseases and opportunistic infections and thus have premature mortality. The cohort included only homeless persons with reportable AIDS, not simply HIV infection. AIDS was a clinical diagnosis during that time period, made when a person suffered an opportunistic infection or AIDS-defining diagnosis, such as Kaposi's sarcoma or *Pneumocystis carinii* pneumonia.¹³ As later studies showed, many homeless persons with HIV infection were dying prematurely and before the disease had progressed to frank AIDS.

New York

Utilizing data from the National Death Index (NDI), Barrow and her colleagues studied mortality in a cohort of 949 homeless men and 311 homeless women who lived in New York City's shelters in 1987. At that time, New York City sheltered approximately 9300 adults each night. This representative sample was interviewed during the summer of 1987 to determine a baseline profile and to identify predictors of mortality. Of note, the NDI did not record cause of death in the database at the time of this study.

Three-quarters of the cohort were African-American. More than half of the cohort was younger than 35 years old, and 57% of the men and 52% of the women had graduated from high school. One-fifth reported a disability or medical impairment that limited daily functioning. 54% of the men and 38% of the women had substance abuse problems, while a third of the cohort reported no mental health or substance abuse problems. The chronicity of homelessness varied considerably, although 18% of men and 19% of women had been homeless for more than half of the previous five years. No street individuals were included in this cohort.

From September 1987 until December 1994 (approximately 7.2 years), 128 (13% of the men and 36 (12%) of the women died. The crude death rates were 1770 per 100,000 person-years of observation for the men, and 1529 per 100,000 person-years of observation for the women. Age-adjusted mortality rates for the homeless cohort were approximately 4 times that of the general United States population, with the SMR 3.9 for men and 4.7 for women. Men 35-44 years of age had an SMR of 6.2, while women 25-44 years of age had an SMR of 14. When compared to the general population of New York City, the overall SMR for men was 2.0 and for women 3.7.

Predictors of mortality were ascertained. Men and women who died reported poorer health in 1987, were more likely to have a disease or injury or handicap, and were more likely to report serious medical conditions such as hypertension, heart problems, cancer, pneumonia, or tuberculosis. Consistent with the Boston findings, neither mental health nor substance abuse problems predicted premature mortality for either the men or the women in the cohort. Almost two-thirds of the men who died had been incarcerated, and the men who died had more chronic histories of homelessness.¹⁴

Toronto

Hwang conducted a three-year cohort study from 1995 through 1997 of homeless men in Toronto, Canada. The cohort included 8933 men aged 18 or older who used Toronto's shelter system in 1995, and the mean follow-up was 2.6 years per person. 201 deaths were identified, for a crude mortality rate of 876 per 100,000 person-years of observation. This number was significantly lower than seen in the U.S. cities of Philadelphia, New York City, and Boston. The mean age at death was 46 (range 20-84). 41% of the deaths occurred outside the hospital, although these sites were not further specified. Deaths were evenly distributed throughout the year. Autopsies were performed on 57% of the decedents.

Age-specific mortality rate ratios were 8.3 (95% confidence interval or CI, 4.4-15.6) for men 18-24 years of age, 3.7 (95% CI, 3.0-4.6) for men 25-44 years of age, and 2.3 (95% CI, 1.8-3.0) for men 45-64 years of age. These rate ratios are remarkably similar to those found by this same author in his Boston study (5.9, 3.0, and 1.6, respectively). Perhaps the most striking finding of this study is that the total mortality rate for homeless men in Toronto is significantly lower than seen in Philadelphia, New York City, and Boston.

The author found mortality rate ratios of 0.52 (95% CI, 0.41-0.65) for men 25-44 years of age in Toronto when compared to that age group in Boston, and 0.61 (95% CI, 0.44-0.85) when compared to that age group in New York City. For men 35-54 years of age, the mortality rate ratio is 0.42 (95% CI, 0.27-0.66) for Toronto compared to Philadelphia.¹⁵ These findings suggest that men in the middle age groups in Toronto have about half the risk of dying if they

were living in any of those U.S. cities, even though they are at greater risk of dying than housed men in Toronto.

This study of men using shelters in Toronto was complemented by a study by Cheung and Hwang of a cohort of 1981 women who used the Toronto shelter system in 1995. This cohort was followed for a mean of 2.6 years per person. The average age was 35 years. 26 women in the cohort died between 1995 and 1997, for a crude mortality rate of 498 deaths per 100,000 person-years of observation. The average age at death was 39 years old. The most common cause of death among women 18–44 years of age were HIV/AIDS and drug overdoses. Homeless women 18–44 years of age are 10 times more likely to die than their housed counterparts in Toronto. Older homeless women in the 45–64 age group have a mortality rate ratio of 1.2.

The authors compared the findings in Toronto with the results of mortality studies of women in Montreal, Copenhagen, Boston, New York City, Philadelphia, and Brighton, England. In all cities, women in the younger age group (16–44 years old) had rate ratios from 4.6–31.2 when compared to the general population in those cities. Thus younger homeless women appear particularly vulnerable and are 5 to 30 times more likely to die than housed women in cities across the world. This risk appears to diminish with age; as in the Toronto cohort, older women in the other cities had mortality rate ratios of 1.0–2.0.

A second finding in this study is noteworthy. In the general population, mortality rates among younger women are much lower than among younger men, usually about one-third to one-half. This competitive advantage persists even among impoverished populations, where women continue to have a longer life expectancy than men. Cheung and Hwang found that the mortality rates among younger homeless women are similar to those of younger homeless men, and this was observed in all of the cities.¹⁶

In another study, Hwang used longitudinal data in a cohort of 8,769 and found a time-dependent association between mortality and shelter use in Toronto. Shelter use was included as a time-dependent covariate in a Cox regression analysis, and the risk of death was increased almost twofold during the months that individuals in this cohort utilized the homeless shelters (hazard ratio 1.84; 95% CI, 1.27–2.67). However, the author notes several reasons why this finding does not necessarily mean that homelessness increases the risk of death, and urges further study necessary to demonstrate a causal relationship.¹⁷

Copenhagen

Nordentoft and colleagues investigated 10-year mortality among homeless persons who used hostels in Copenhagen in 1991. Two groups were observed: 579 people who stayed in one major hostel in 1991; and a representative sample of 185 persons who stayed in the original

shelter and one other hostel in Copenhagen. The Danish cause of death register in 2002 showed that 141 deaths had occurred among the homeless cohorts. The SMR for the entire cohort was 3.8 (95% CI, 3.5–4.1): 2.8 (95% CI, 2.6–3.1) for men and 5.6 (95% CI, 4.3–6.9) for women. Mortality was especially high in younger men and women 15–34 years of age. Suicide was six times more common in the cohort than in the general population, and death due to unintentional injuries was almost 15 times more common. As in other studies, psychosis and mental illness were not predictive of death. Predictors of early death, obtained from the interview sample, were adverse childhood experiences (especially the death of the father) and the misuse of alcohol and sedatives.¹⁸

IV. Studies of Sub-Groups of Homeless Persons

Homeless Persons with Schizophrenia in Sydney, Australia

Another 10-year study examined mortality among homeless persons with schizophrenia in Sydney, Australia. Babidge and colleagues assessed a cohort of 708 homeless persons referred to psychiatric outreach clinics between January 1988 and September 1991. 506 of these individuals were diagnosed with schizophrenia. The median follow-up time was 9.5 years (range 7–11 years). The list of names in the cohort was submitted to the New South Wales Registry of Births, Deaths and Marriages to determine the number of deaths between 1988 and 1998.

Eighty-three (12%) in the cohort of 708 died, with a mean age of death of 50 for men and 57 for women. Fifty-three (64%) of the deaths were due to natural causes, including 43 men and all 10 of the women who died. Thirty (36%) deaths were classified as external: 19 from suicide and 10 from unintentional accidents, injuries, or overdoses. One death was undetermined: this 30 year old man with Munchausen's Syndrome, personality disorder, and substance abuse was found dead by a highway. No deaths were due to homicide, in contrast to studies from American cities. AIDS was an uncommon cause of death.

The SMR was 3.8 for homeless men and 3.1 for homeless women, with excess mortality highest among the younger age groups. The authors also found a trend toward higher excess mortality among men without schizophrenia compared to men with schizophrenia.¹⁹ The cohort in this study, however, included only homeless persons referred for psychiatric care and is clearly biased toward the homeless mentally ill and not representative of the overall homeless population.

Mentally Ill Homeless Veterans in the United States

Kasprow and colleagues compared mortality risk in homeless and non-homeless mentally ill veterans. This retrospective cohort study assessed mortality over a 9-year period (1989–1998) in 6714 homeless and 1715 non-homeless male veterans who received care in specialized mental health programs in the Department of Veteran Affairs (DVA). Mortality was determined from the dates of death in the DVA’s Beneficiary Identification Records Locator Subsystem database. The mortality rate was 2,210 per 100,000 person-years of observation, which is consistent with studies of homeless populations in the cities noted above. Of note, the mortality rate for U.S. males 35 years and older is 1,586 per 100,000 person-years. The SMR for veterans 35-54 years of age who had been homeless less than one year was 4.2 (95% CI, 3.81–4.61) and 4.13 (95% CI, 3.29–4.83) for those homeless more than one year. Non-homeless veterans 35-54 years of age had an SMR of 3.16 (95% CI, 2.61–3.76). The SMRs were lower for veterans over age 55: 1.69 (95% CI, 1.51–1.87) for those homeless less than one year, and 1.40 (95% CI, 1.16–1.66) for those homeless more than one year. This study found no clear relationship between mortality and the length of time homeless, and unlike Barrow’s study in New York City, found a non-significant trend toward increased mortality in those groups with shorter durations of homelessness.²⁰

Street Youth in Montreal, Canada

Roy and colleagues conducted a prospective cohort study of mortality in 1013 Montreal street youth 14–25 years of age from January 1995 to September 2000. 26 youths in this cohort died in that time period. The mortality rate was 921 (95% CI, 602–1350) per 100,000 person-years of observation, and the SMR for this age group was 11.4. The authors note that this finding is consistent with age-related mortality ratios in Boston, Toronto, New York, and Copenhagen. One half of the deaths were due to suicide, 8 to overdoses, and 2 to unintentional injuries. Independent predictors of mortality included HIV infection (adjusted hazard ratio 5.6; 95% CI, 1.9–16.8), daily alcohol use in the last month (AHR 3.2; 95% CI, 1.3–7.7), homelessness in the last 6 months (AHR 3.0; 95% CI, 1.1–7.6), drug injection in the last month (AHR 2.7; 95% CI, 1.2–6.2), and male sex (AHR 2.6; 95% CI, 0.9–7.7).²¹

Homeless Persons with HIV/AIDS in San Francisco

A prospective cohort study of homeless and marginally housed individuals with HIV/AIDS was conducted by Riley and colleagues from 1996 to 2002. 57 deaths occurred among the 330 persons in the cohort. HIV was the major cause of death, and sustained anti-retroviral treatment reduced the risk of death by 62%. Baseline drug use, housing status, and HCV infection did not significantly affect death in this cohort.²²

V. The Street Population

The studies above identified cohorts of homeless persons who utilized shelters or specialized clinics for homeless persons. Few studies have been able to assess mortality in the sub-group of homeless individuals who live on the streets. These elusive “rough sleepers,” vulnerable to the extremes of weather and violence, may have higher mortality rates than homeless persons who utilize shelters. Despite intense media scrutiny and high public visibility, little is known of the health and health care outcomes of this group of chronically homeless individuals.

Thirteen highly publicized deaths occurred on the streets of Boston in the fall and winter of 1998–1999, and galvanized an effort to study the causes and circumstances surrounding these deaths. Despite severe and persistent mental illness in two-thirds of these individuals, and acute and chronic alcohol use in all but one of the decedents, the causes of death were primarily related to complications of chronic medical illnesses.

Moreover, the Commonwealth’s Department of Public Health, together with the City of Boston and the Massachusetts Shelter and Housing Alliance, found that the decedents, 12 men and one woman, had been in frequent contact with the medical and substance abuse systems in the days and weeks prior to their deaths. Nine (69%) of the 13 individuals had been admitted to local hospitals or seen in area emergency departments within three weeks of their deaths. Ten (77%) had been admitted to public detoxification centers within 6 weeks of death, of whom 3 (23%) had died within one week of detoxification from alcohol. Of note, 9 (69%) of the deaths occurred on Sunday or early Monday morning. The authors speculate that this may have been related to Massachusetts “Blue Laws” which prohibit the sale of alcoholic beverages on Sundays.²³

Since 2000, the Boston Health Care for the Homeless Program has prospectively followed a cohort of 119 chronically homeless persons who had been living on the streets for at least six consecutive months. The ethnicity of this group did not differ significantly from that of the general population of Boston. 75% of the cohort was male, and the mean age was 47 years. At the end of 5 years, 33 individuals (28%) had died and 6 (7%) were in nursing homes. The average age at death was 51 years. The most common causes of death were cancer and cirrhosis, and only one person died of hypothermia. Deaths occurred at all times of the year. During the five years from 1999 through 2003, this group had a total of 18,384 emergency room visits.²⁴ Further analysis of the data from this cohort study is in progress, but the observation that more than a quarter of these individuals died in the five-year observation period from 2000 through 2004 suggests a significantly increased risk of death for homeless persons living on the streets.

Another Boston study prospectively followed 30 elderly rough sleepers ages 60 years and older for a four-year period from 2000 through 2003. This group of 8 (23%) women and 22 (73%) men ranged in age from 60 to 82 years with an average age of 67 years. Twenty-eight (93%) of these elderly individuals had been living on the streets for 10 years or longer, and 14 (47%) for longer than two decades. During the four year observation period, 9 (30%) and 6 (20%) had been placed in nursing homes. Only 5 (17%) had been placed in housing, and 9 (30%) remained on the streets.²⁵

VI. Summary

Early mapping studies of mortality data observed increased rates of premature death in geographic “zones of mortality.” These “death zones” included impoverished areas with high numbers of homeless persons, shelters, soup kitchens, and substandard housing. This observation, known as the “lodging house effect,” established an early and intricate relationship between homelessness and early death. Subsequent studies in major cities across the United States, Canada, Europe, Asia, and Australia have confirmed a persistent relationship between a lack of housing and excess mortality. Despite a diversity of methodologies utilized across multiple continents, the current literature reviewed in this paper demonstrates a remarkable consistency that transcends borders, cultures and oceans: *homeless persons are 3–4 times more likely to die than the general population.*

Age-related mortality ratios reveal that homeless persons in all age groups have a higher risk of death than people of similar ages in the general population of the cities cited in this paper. The most glaring discrepancies in mortality ratios are seen in the younger and middle-aged groups from 18 to 34 years and from 35 to 54 years of age. While elderly homeless persons have a greater risk of dying than their housed counterparts, the standard mortality ratios across these cities are not as dramatic as for the younger age groups.

Younger homeless women have from 4–31 times the risk of dying when compared to housed women, and younger homeless women have similar risks of premature death than younger homeless men. The usual competitive advantage of women over men, with increased life expectancy even in impoverished areas, appears to disappear in these studies, a finding that merits further investigation. Further study could also narrow the wide range of this finding. The average age of death in the studies reviewed is between 42 and 52 years, despite an average life expectancy of almost 80 years in this county. The potential years of life lost are incalculable.

Deaths occur throughout the year, not only during the colder months of winter. Hypothermia and exposure are surprisingly infrequent causes of death. Premature death is more highly associated with acute and chronic medical conditions than with either mental illness or substance abuse. The “tri-morbidity” of substance abuse and mental illness together with one or more

chronic medical illnesses appears to increase the risk of early death. Health care utilization prior to death is variable and remains poorly understood, although several studies show high numbers of emergency room visits as well as multiple contacts with medical, mental health, and substance abuse services and facilities in the days and weeks before death. Increased efforts are indicated to assure access to coordinated care, especially early in the disease processes which kill homeless people. Efforts to provide and evaluate housing as a health care intervention are also warranted.

Many sub-groups of homeless persons appear particularly vulnerable, especially those living with AIDS, street youth, mentally ill veterans, and those who live chronically on the streets. Most studies to date have been based on cohorts of homeless persons utilizing the shelter or clinic systems, and further study of those “sleeping rough” is warranted.

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