

# A Public Health Approach to Reducing Morbidity and Mortality Among Homeless People in Boston

James J. O'Connell, Shawn Mattison, Christine M. Judge, H. Joslyn Strupp Allen, and Howard K. Koh

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Urban homeless populations suffer disproportionately high rates of premature death. In response to a wave of highly publicized deaths on the streets of Boston during the winter of 1998–1999, the Massachusetts Department of Public Health (MDPH) convened a task force to investigate these deaths and implement an integrated response to this public health crisis. Comprised of a broad coalition of public and private agencies as well as homeless persons and advocacy groups, the MDPH Task Force reviewed the circumstances surrounding the 13 deaths, monitored subsequent deaths among homeless persons in Boston, and implemented a comprehensive plan to address critical needs and prevent further deaths. Contrary to the task force's initial assumption, the 13 decedents had not "fallen through the safety net" but had multiple recent contacts with the medical, psychiatric, and substance abuse systems. In response to this finding, the MDPH Task Force sought to improve continuity of care and prevent future deaths among Boston's street population. Coordination of needed services was achieved through the creation of new, and often unconventional, partnerships. This case study exemplifies a public health practice response to the vexing health care challenges confronting homeless people who must struggle to survive on the streets and in shelters.

**KEY WORDS:** delivery of health care, homeless persons, mortality, public health practice, urban health services

Homeless persons in urban areas suffer disproportionately high rates of premature death, largely from preventable causes. In the United States, studies from Philadelphia, Boston, and New York City have documented higher mortality risks in homeless individuals compared with the general population.<sup>1–3</sup> Pre-

ventable street deaths among homeless persons (due to hypothermia and other conditions resulting from neglect) represent a particularly compelling societal challenge.

Unattended deaths of homeless people on the streets (ie, "street deaths") emerged as a public health crisis in Boston during the decade of the 1990s. In particular, a wave of street deaths during the winter of 1998–1999 generated wide public concern and prompted a broad public health response.<sup>4</sup> A special public health task force was convened with the goals of understanding the root causes of such deaths and developing strategies to prevent future deaths among the elusive and often hard-to-reach street population. We describe that process as a case study of a public health practice response to this vexing health care challenge. The task force focused on Boston's rough sleepers, a subgroup of homeless individuals who avoid public shelters and hostels and sleep in the streets. Such "street people" sleep in doorways and alleys, in bus terminals and train

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Corresponding author: Christine M. Judge, MS, Harvard School of Public Health, Division of Public Health Practice, 677 Huntington Ave, Boston, MA 02115 (e-mail: [cjudge@hsph.harvard.edu](mailto:cjudge@hsph.harvard.edu)).

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**James J. O'Connell, MD**, is President, Boston Health Care for the Homeless Program, Boston, Massachusetts.

**Shawn Mattison, MS**, was a graduate student in the Department of Health Policy and Management, Harvard School of Public Health, Boston, Massachusetts at the time of the study.

**Christine M. Judge, MS**, is Research Specialist, Division of Public Health Practice, Harvard School of Public Health, Boston, Massachusetts.

**H. Joslyn Strupp Allen, MSW**, is Research Associate, Boston Health Care for the Homeless Program, Boston, Massachusetts.

**Howard K. Koh, MD, MPH**, is Director, Division of Public Health Practice, Associate Dean for Public Health Practice, and Professor, Health Policy and Management, Harvard School of Public Health, Boston, Massachusetts.

stations, under bridges and in subway tunnels, and in secluded places such as abandoned buildings and cars.

### ● Task Force Goals and Activities

In early 1999, in response to the deaths in Boston, the Massachusetts Department of Public Health (MDPH) launched a task force representing a broad array of interest groups committed to the welfare and care of homeless persons living on the streets. Convened and chaired by the MDPH Commissioner, this task force of approximately 75 persons met regularly through 1999–2002. It included representation from the following: state agencies (including mental health, public health, welfare, housing, and corrections); the Emergency Shelter Commission of the City of Boston; academic medical centers (including Massachusetts General Hospital, New England Medical Center, and Boston Medical Center); detoxification units and recovery programs; homeless advocates (particularly the Massachusetts Shelter and Housing Alliance and Homes for Families); homeless persons; health care clinicians; state, city, and metropolitan transit authority police; emergency medical services (EMS); shelter providers and street outreach workers; downtown neighborhood associations; and researchers and evaluators from local universities.

The MDPH Task Force goals were to understand the root causes of street deaths and to develop strategies for preventing future deaths. In working toward these goals, the specific objectives of the task force were (1) gathering descriptive data on street deaths, improving data collection, and tracking high-risk homeless persons and (2) engaging rough sleepers in primary care and substance abuse treatment to improve primary care outcomes and prevent death.

### ● Understanding the Root Causes of Street Deaths

In trying to understand the nature of deaths among homeless individuals, the MDPH Task Force first wrestled with the absence of an official tracking system. Estimates of the number of homeless individuals in urban areas vary, and the results are often contentious. Since 1986, the Emergency Shelter Commission of the City of Boston has conducted an annual single-night census on the second Monday of December. While the census likely undercounts the true number of homeless individuals and families, important trends can be identified. A total of 5,272 homeless individuals were counted in 1998, with a gradual increase in subsequent years to 6,241 in 2003 (Figure 1). The number of people

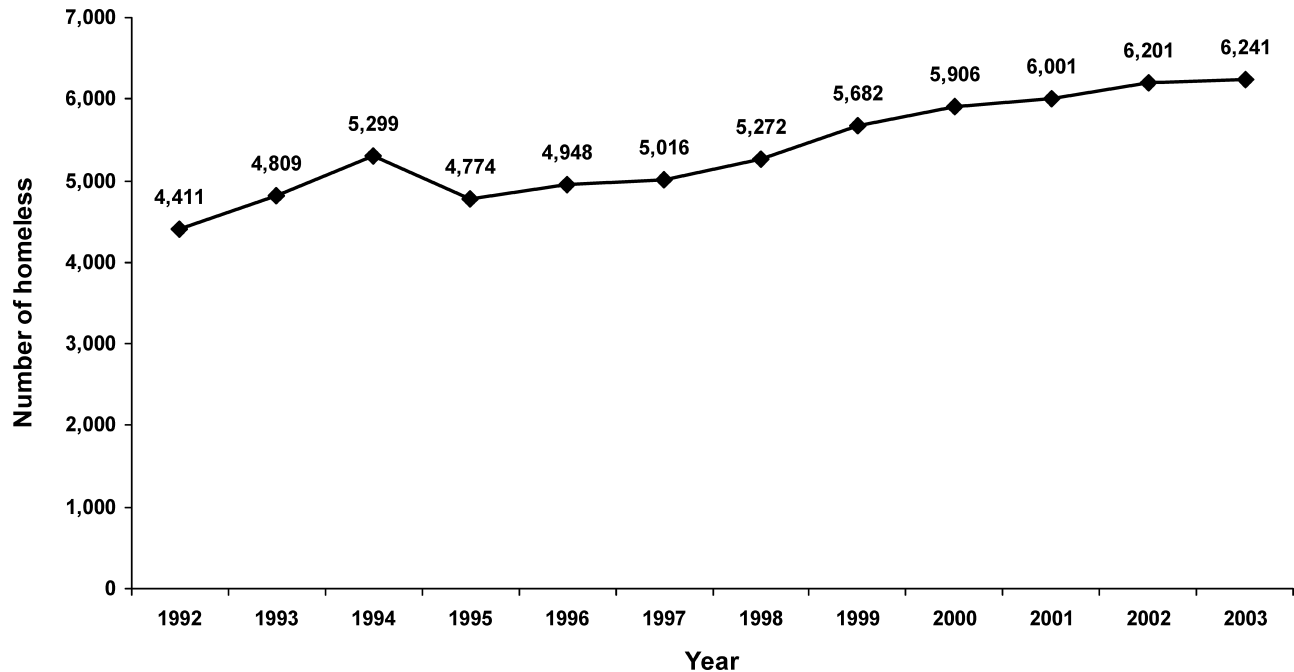
sleeping rough at the time of the 2003 Boston census was 230, a population that swelled to more than 1,200 in the warmer months, according to logs kept by homeless health care providers and shelter outreach workers.

The lack of standardized definitions for subcategories of homeless deaths presented a second obstacle. Deaths among homeless persons occur not only on the streets but also in shelters, hospitals, and other facilities. Of the 40 to 80 homeless deaths each year, a review of aggregate homeless mortality data since 1988 showed that 24 to 30 persons died annually on the streets. The task force was especially concerned with these deaths on the streets, and subsequently distinguished between street deaths that are preventable and those that are less amenable to prevention (homicide, trauma, end-stage medical illnesses such as cancer or cirrhosis). (Further analysis is needed to determine the precise number and causes of street deaths that occurred prior to the inception of the MDPH Task Force.)

MDPH Task Force members, led by the Boston Health Care for the Homeless Program (BHCHP), worked closely with the Commonwealth's Office of the Chief Medical Examiner to gather descriptive data on 13 street deaths that occurred from mid-1998 through early 1999. The members conducted a retrospective review of death certificates and available medical records for the decedents; BHCHP's medical records (including admissions to the McInnis House, the BHCHP's 90-bed medical respite facility for sick and injured homeless persons, and documentation through its "street" database for outreach encounters); charts at the three academic medical centers where BHCHP conducts primary care clinics and inpatient care; and data from the MDPH's Bureau of Substance Abuse Services.

Of the 13 street deaths, occurring from July 4, 1998, through January 29, 1999, 12 involved men. The mean and median age was 44 years (range 30–57 years). Eight were White, three African American, and two Latino. The only woman in this cohort was African American. All but one (92%) of the decedents suffered from chronic alcoholism, while the remaining person used heroin and occasional alcohol. Eight (62%) of the 13 individuals suffered from severe and persistent mental illness, as evidenced by a documented *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV)* diagnosis in the medical record. All 13 (100%) of those who died had multiple acute and chronic medical illnesses.

While all 13 died on the street, the cause of death varied. Hypothermia was the primary cause of death for 3 (23%) of the 13 individuals. Two others succumbed to trauma. Seizures were the immediate cause of two deaths, both in the setting of alcohol withdrawal. Four deaths were related to chronic medical illnesses, including diabetes, end-stage liver disease, and chronic



**FIGURE 1.** Homeless count by year, 1992–2003, Boston, Massachusetts. Data source: Homeless counts, City of Boston Emergency Shelter.

obstructive pulmonary disease (2 individuals). Two persons drowned.

The task force initially conjectured that these individuals had somehow fallen through the safety net, eluding state and city services and succumbing in back alleys and other sites while hidden from society. To our surprise, all of the deceased individuals had BHCHP medical records and had contact with multiple points of care in the medical, psychiatric, and substance abuse systems in the recent period before their death. Death certificate information verified the place of death. The deaths occurred in busy and populated areas of the city, such as on the gates outside the Boston Public Library, in a doorway across from the Cathedral of the Holy Cross (seat of the Catholic Archdiocese of Boston), behind the main headquarters of the Boston Police Department, in front of the state's Transportation Building, and in a park on the grounds of a major academic teaching hospital. The locations of the deaths are depicted in Figure 2.

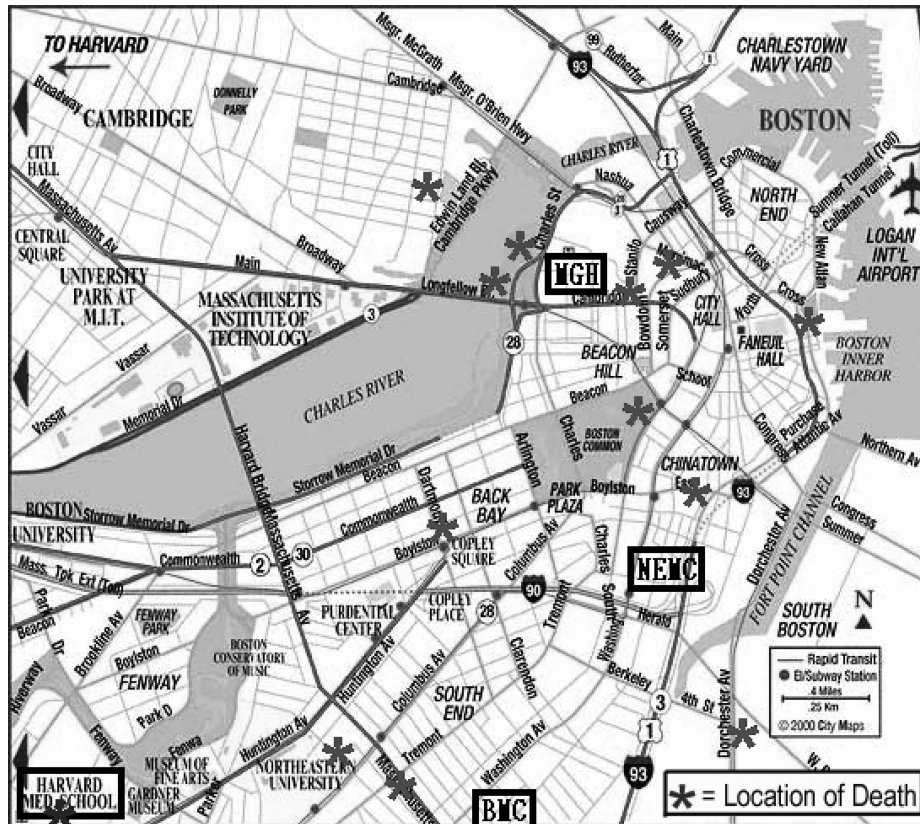
The pattern of health care utilization prior to death was remarkable for multiple emergency department visits and hospitalizations, particularly in the 6 months prior to death. In fact, 9 of 13 (69%) had been seen in local emergency departments or admitted to acute care hospitals within 3 weeks prior to death. This frequency of utilization of the medical health care system was paralleled by a dramatic number of admissions to publicly funded detoxification programs. Ten of the decedents (77%) had received detoxification services (from alcohol and other drugs) within 6 weeks prior to death,

and three (23%) died on the streets within 1 week of discharge from a detoxification unit.

Of note, nine (69%) of the deaths occurred on Sunday or early Monday morning. We speculated that because Massachusetts "Blue Laws" made alcohol unavailable on Sundays, people suffering from alcoholism were placed at a higher risk of the consequences of acute alcohol withdrawal syndrome on that particular day of the week. Also of note, all of these individuals had been noted (in the medical records) to use Listerine™, which has an alcohol content of 27% and is easily available on Sundays.

### ● Developing Strategies to Prevent Street Deaths

With an understanding of the descriptive details surrounding the street deaths, the MDPH Task Force then sought to coordinate and improve the health care of homeless men and women, with the specific goal of preventing street deaths. The MDPH Task Force targeted those homeless persons who were at a high risk of premature death. A previous study had identified specific risk factors for premature mortality among homeless persons.<sup>5</sup> During early 2000, BHCHP used this risk factor profile to identify a "high risk" cohort of 119 individuals who had been sleeping regularly on the streets for 6 months or more and who had one or more high-risk conditions: (1) "trimorbidity" of substance abuse, severe persistent mental illness, and multiple chronic



**FIGURE 2.** Locations of deaths of 13 homeless persons on the streets of Boston, Massachusetts, 1998–1999. Data source: Boston Health Care for the Homeless Program Research Office.

medical illness; (2) major medical problem(s) resulting in hospital admission, multiple emergency department visits (3 or more visits in the previous 3 months), or admission to the respite facility anytime during the previous year; (3) age more than 60 years; (4) known human immunodeficiency virus/acquired immunodeficiency syndrome; (5) known cirrhosis, end-stage liver disease, or renal failure; and (6) previous history of frostbite, hypothermia, or immersion foot. After identifying such high-risk homeless persons, task force members then worked to create a more integrated system of care involving hospitals and health care workers, substance abuse providers, EMS, and shelter providers capable of monitoring and supporting these individuals.

The MDPH Task Force improved the web of services for homeless individuals. The Mayor of Boston secured funds for Pine Street Inn to add a second overnight rescue van to increase transportation capacity from hospitals to shelters, as well as from the streets to local detoxification centers and emergency departments. The hours of the day and evening street outreach teams were expanded to include Sundays and early Monday mornings to facilitate referrals to detoxification units and hospital emergency departments.

In addition, several key Boston hospital emergency departments agreed to avoid late-night discharges of

homeless individuals unless transportation to an available shelter had been previously arranged. Detoxification centers agreed to reserve beds for late-night as well as Sunday admissions directly from the streets; by forgoing the usual requirement of a medical clearance in the emergency department, this agreement obviated prolonged waiting times in crowded emergency departments. The BHCHP's McInnis House made three cots available each night for admissions directly from the van and the emergency department.

Additional activities strengthened the service delivery network. The emergency medical services, police, and transit authority officials committed to assisting individuals to shelters or emergency departments. The BHCHP's medical team sought to deliver primary as well as episodic care directly on the streets with a goal of improving continuity of care and health care outcomes for this group of individuals. Traditionally, homeless persons assiduously avoided clinic sites in the shelters and the hospitals for reasons that reflect the complexity of homelessness, including lack of insurance, social isolation, and the prioritization of other aspects of survival over health care.<sup>6</sup> The team began tracking these outreach efforts by evaluating the percentage of street persons with timely primary care benchmark indicators (including influenza vaccinations, purified protein derivative testing for tuberculosis, vaccination

for pneumonia (Pneumovax™), stool for occult blood, screening for syphilis, and age-appropriate Papanicolaou smears and mammograms for women). Area shelters, which were usually full by the early evening and typically not able to accept persons in the late night hours, agreed to amnesty for all street persons during the cold weather and kept the doors open throughout the night for persons seeking to come in from the cold.

### ● Progress in Reducing Street Deaths in Boston

Implementation of the new tracking system for high-risk homeless individuals allowed for a consistent monitoring of overall homeless deaths from 2000 onward. The BHCHP's street team reviewed the high-risk list each week, and all known deaths on the streets were reported at monthly meetings convened by Boston's Emergency Shelter Commission that included police, EMS, outreach workers, shelter providers, and representatives from state and city agencies as well as local emergency departments. Despite rising numbers of homeless persons, overall deaths among Boston's homeless population declined from 58 (in 2000) to 46 (in 2003). During this 4-year observation period, an average of 16 street deaths occurred annually, a decline from the 24 to 30 annual street deaths seen previously. Of the more than 60 street deaths during the 4-year period, only three street deaths were attributed to hypothermia. While we cannot directly attribute this decrease in street deaths to the interventions of the MDPH Task Force, efforts to improve and coordinate care for the street population may have helped to respond to the special needs of this high-risk group.

### ● Discussion

To our knowledge, this is the first report to describe a public health approach to the prevention of street deaths among homeless individuals. While not a formal epidemiologic study, this public health response through the MDPH Task Force led to a number of insights. First, findings from the analysis of Boston street deaths in 1998–1999 ran contrary to the assumption that such deaths occurred in homeless individuals unknown to the health care system who had fallen through the safety net. In fact, homeless persons who died unattended on the streets were likely to have had a recent health care contact, and 9 of the 13 had been seen in hospitals and emergency departments within 3 weeks prior to their death.<sup>7</sup> Hence, we con-

cluded that unattended wintertime street deaths occurred among individuals well known to the service system who had become “lost” among multiple points of care. A recent study confirms the substantial but inconsistent use of services by the high-risk cohort of homeless identified in 2000 as a result of the task force.<sup>8</sup>

This insight led to a further commitment by task force members to strengthen the web of services supporting homeless individuals. The task force united a broad coalition of public and private partners in a common mission. Many innovative, and often unconventional, collaborations were created, such as those between the police and outreach workers, between hospital and emergency department staff and the Mayor's office, and between neighborhood associations and shelter providers. As a result, care for homeless individuals was marked by increased outreach and coordination between shelters, detoxification centers, and hospital emergency departments. Providers also improved efforts to enroll homeless individuals into primary care.

Work of the MDPH Task Force also advanced the understanding of risk factors for death in homeless persons. Hwang et al had previously documented that homeless individuals who had experienced frostbite, hypothermia, or immersion foot, for example, were 6.7 times as likely to die as those without such risk factors.<sup>5</sup> Providers used this information to maintain and track a high-risk group of 120 to 140 individuals with the goal of preventing street deaths.

Since alcoholism played a major role in the lives of almost all of the 13 decedents, the task force focused much attention on the challenge of substance abuse services within the web of services supporting homeless individuals. The task force analysis also showed that most deaths occurred on Sunday or early Monday morning when lack of alcohol availability likely enhanced the possibility of alcohol withdrawal complications. In this context, use of Listerine, while not inherently dangerous, could be viewed as a marker for end-stage alcoholism and a risk factor for premature mortality. As a direct result of the efforts of the MDPH Task Force, the emergency departments in Boston now treat individuals who present with Listerine use as in need of detoxification and aggressive substance abuse intervention.

Since the inception of the task force, street deaths due to hypothermia have occurred, on average, less than once each year, despite growing numbers of homeless persons, escalating housing costs, a worsening economy, and in the absence of extraordinary long-term changes in wintertime weather. While assigning causality is not possible, the improved integration of services has emerged as a clear outcome

of this public health effort. In fact, the Emergency Shelter Commission of the City of Boston has now created a comprehensive winter plan, modeled on the work of the MDPH Task Force, which was successfully implemented during a record-breaking cold streak in January 2004.

Future public health research on homeless street deaths should focus on more formal interventions with strict study designs and should address the many questions raised by our efforts. For example, it is not clear how the morbidity/mortality profile of the 13 decedents of this case study compares with that of other homeless. Efforts by Meschede<sup>8</sup> and others are further defining and exploring bridges and barriers to housing for chronically homeless street dwellers. In the meantime, the MDPH Task Force created a forum in which diverse perspectives could be safely shared and common solutions could begin to be explored. Homelessness remains a complex societal problem and the added risk of death for homeless persons has been documented in prior studies. More national experience in such integrated models and more formal evaluation of their impact could offer avenues for preventing street deaths and improving medical care for homeless individuals in the future.

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