Amenable mortality within the New Zealand homeless population: we can do better!

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ABSTRACT

AIM: To describe the context surrounding the deaths of homeless people in New Zealand and to determine the proportion of deaths that could be considered amenable to healthcare.

METHOD: We used coroners' findings related to 171 deaths of persons with "no fixed abode" at the time of death, from 2008 to 2019. Recent lists of amenable mortality from the New Zealand Ministry of Health and the Office of National Statistics in the UK were combined to determine the rate of amenable mortality.

RESULTS: The life expectancy of homeless persons identified in this sample was 30 years shorter than in the housed population, with a mean age of death of 45.7 years. Deaths occurred mainly alone, in public spaces (56.1%) or in private vehicles (14%). Three-quarters (75.8%) of homeless persons died from conditions amenable to timely and effective healthcare interventions, mostly from natural causes (45.7%) and suicide (41.5%).

CONCLUSION: Homeless people experience considerable challenges when accessing the healthcare system, as uncovered by the dramatic rate of amenable mortality. Our findings highlight the urgent need to implement specific models of care that are designed to meet the social and healthcare needs of homeless persons and address the significant health inequalities they experience.

Homelessness is an increasing and complex worldwide issue. New Zealand, like other higher-income countries, faces a growing prevalence of homelessness. Estimates indicate that between the 2006 and 2013 censuses, the absolute number of homeless persons increased from 33,000 to 41,000 (an increase of 24.2%), compared to the population growth during the same period of 5.3%.[1–2] Definitions of homelessness vary across countries depending on the social, cultural and legal context in which they operate.[3] The New Zealand Coalition to End Homelessness adopted a broad definition of homelessness based on a gradation of housing insecurity, ranging from those living rough or in their cars to those living in uninhabitable dwellings, in temporary accommodation or in overcrowded households.[4] Widening the definition of homelessness means that "hidden homelessness" is accounted for and better illustrates the health inequalities that impact mainly Māori and Pasifika peoples among this population.[4]

Health inequalities that affect the homeless population worldwide contribute disproportionately to a dramatic premature mortality rate compared to the housed population. Although the mortality rate varies between studies, typically homeless people die 15 to 30 years younger than their housed counterparts.[5–7] A New Zealand hospital-based study looked at risk factors for mortality in a cohort of homeless patients, which included 126 deaths with a median age of death of 52.6 years.[8] Many of the patients had a record of cardiovascular disease and diabetes as well as mental health issues and substance misuse.

Premature mortality results from a complex combination of medical conditions often related to severe and chronic comorbidities and the consequences of social exclusion shaped by homelessness—that is, marginalisation and stigma, loneliness, violence and adverse living conditions. Consequently, homeless people experience poor and irregular access to healthcare, unmet care needs, delays in clinical presen-

tations and a high use of emergency departments.[9–12] Yet, access to high-quality healthcare improves many health outcomes and can reduce the number of premature deaths.[13] The concept of amenable mortality as an indicator of performance (eg, weakness or strength) of the health system has been debated for decades as a way to determine the boundaries of health interventions.[14] The New Zealand approach has been to develop a measure of amenable mortality that reflects the performance of the healthcare system, excluding a wider and intersectoral approach based on the social determinants of health.[15] Amenable mortality is an important indicator of healthcare access and quality, which serves to identify areas of healthcare concern and support specific healthcare initiatives for diseases where effective intervention exist.[16] The classification of causes of death amenable to clinical interventions is based on expert reviews of medical knowledge and technologies and the causal epidemiology of diseases. To improve health outcomes within the population and reduce health inequalities, the New Zealand amenable mortality list was updated in 2016 as part of the System Level Measures and the refreshed New Zealand Health Strategy.[16]

The objectives of this present study are to use coroners' reports to describe the context surrounding the deaths of homeless people in New Zealand and to determine the proportion of deaths that could be considered amenable to healthcare intervention.

Method

Data collection

A critical challenge in reporting the deaths of homeless people is the lack of a systematised source of statistics for this population. The Mortality Collection classifies all causes of death registered in New Zealand using the International Classification of Diseases, Tenth Edition (ICD-10). The inclusion of the ICD-10 coding for homelessness (Z.590) has only recently begun to be used for identifying or registering the deaths of homeless people. These data are incomplete, and so the Mortality Collection is not a viable source of homeless mortality data.

Further, within District Health Boards (DHBs), the use of the Z.590 code has not been generally adopted. How DHBs record "no fixed abode" is unclear and varies between different hospitals.

Instead, the utility of medico-legal databases is recognised worldwide as a valid source of data for public health endeavours, especially for accessing data on populations that are difficult to reach (such as homeless people or prisoners) or to determine the nature, distribution and determinants of amenable deaths such as suicide.[17–19] Under the New Zealand Coroners Act 2006, deaths must be reported to the coroner if the death appears to (a) be without known cause, self-inflicted, unnatural or violent, (b) have occurred as a potential result of a medical procedure, (c) have occurred while someone was in official custody or care or (d) have been in relation to which no death certificate was issued.[20] The Case Management System is the New Zealand database systematically recording all deaths reported to coroners since 2007. The Information Advisor of the Coronial Office of Wellington provided data on all coronial deaths with the "no fixed abode" criterion at the time of death. One hundred and seventy six full-text coroners' findings reports were identified and released to SCF (first researcher). This included all the deaths of people with no fixed abode that were reviewed by the coronial service between January 2008 to June 2019.

Data analysis

Five cases did not meet the criteria for homelessness. The study sample is thus based on 171 coroners' reports. Demographic information was extracted from each report. Since ethnicity was not reported individually in the coroners' reports, this information is not available. The circumstances surrounding the deaths were obtained from the elements of information accompanying the coroners' findings: extracts of police and toxicology reports, forensic examination, witnesses' statements and elements of medical history provided by DHBs, community services or general practitioners. The majority of deaths due to natural causes were not followed up by a coroner's inquiry. Only a few inquiries into patients who died from natural causes (n=10) were considered necessary by the

coroners. Detailed medical information for all the deaths included due to natural causes was therefore not available for analysis. Conversely, deaths by suicide were assessed and ascertained after a long and detailed coroner's inquiry, enabling a detailed analysis. Underlying causes of death, based on forensic examination findings, were coded using ICD-10 classification. For the purposes of this study, drug- and alcohol-related deaths were coded using the proposal from Randall et al.[21] All deaths directly related to drug or alcohol use were coded as accidental poisoning (X40-X45) or related to mental and behavioural disorders (F10-F16, F19, F55). The causes of amenable mortality were revisited, combining the lists published recently by the New Zealand Ministry of Health (2016)[16] and by the Office of National Statistics in the UK.[22] This latter list was the main basis used to develop the amenable mortality list common to all the OECD countries.[23] It is based on a previous definition of amenable mortality that was developed for use in the Australian and New Zealand context.[24] Given this common background, and that aetiologies of diseases, risk factors and the healthcare standards are likely to be similar, the combination of the two lists was regarded as applicable. Variations across amenable mortality lists rely on different subcategories within groups of diseases and depend on the local epidemiology of diseases and the evidence of effectiveness of the intervention, as well as the quality of the cause-of-death coding procedure. For example, pneumonia not related to pneumococcal infection was removed from the New Zealand list because the quality of coding was deemed inadequate by the expert panel.[15] Health inequalities are extreme for the homeless population since they are marginalised in terms of accessibility to healthcare. Hence, the list that we have used was enlarged accordingly to capture all relevant amenable conditions. The threshold is set at 75 years of age for amenable deaths other than by accident or suicide, due to the frequent difficulty of assigning a single cause to deaths beyond this age in the general population.

Ethics approval

Ethics approval was obtained from the Human and Research Ethics Committee from the University of Waikato.

Results

Sociodemographic characteristics

Of the 171 homeless people's deaths reported to the coronial office, the majority were males (n=145, 84.7%), with females accounting for 15.2% (n=26). The mean age of death regardless of cause or gender was 45.7 years: 46.7 years for females and 44.8 years for males. The average age of death by accident and suicide was dramatically younger: 36.5 years and 38.2 years, respectively (Table 1). At the time of death, a small minority (n=25) of homeless people were employed (14.6%). The majority of people were unemployed (n=91, 53.2%), with a small number receiving a benefit (10.5%). Eleven homeless people were retired (6.43%). The information was unavailable for nine individuals (5.2%) and not specified in 17 cases (9.94%).

Underlying causes of death (Table 1)

The main cause of death was from natural causes (42.6%). Among these, deaths from cardiovascular diseases were the most frequent (n=33), followed by infectious diseases (n=9) and acute alcohol toxicity (n=7). Three cases of death by hypothermia were also reported. Suicide, ascertained by clear evidence of an intention to end one's life, accounted for nearly one third of all deaths (n=49). Thirty-three deaths (19.2%) were classified as accidental and mainly attributed to a vehicle crash or a pedestrian struck by a vehicle or a train (n=12), a fall from a height (n=7), a fire (n=4) or a drug overdose (n=4). Deaths from an unascertained nature due to an advanced decomposition of the body or the impossibility of precisely determining the cause of death accounted for 5.2% of all deaths. Seven deaths were the consequence of criminal homicides.

Circumstances of death and amenable mortality (Table 2)

Information on the location of death was available for 168 deaths. The most common place where death occurred, regardless of the cause of death, was public spaces such as streets, doorways, parks and reserves, forests, beaches, harbours or rivers (56.1%), followed by private cars or campervans (14%), private housing, but mainly garages (12.8%), hospitals (8.7%) and temporary

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Table 1: Underlying causes of death and amenable mortality by age group (n=171).

Age group	Suicide N=49 (28.6%)	Accident N=33 (19.2%)	Natural N=73 (42.6%)	Homicide N=7 (4.09%)	Unascer-tained N=9 (5.2%)	Total cause N=171	Amenable N=118/153 (75.8%)
Mean age (SD)	38.2 (14–61)	36.5 (13–57)	54.5 (17–78)	44.2 (27–64)	44.7 (25–57)	45.7 (13–78)	45.4 (13–71)
10–14	1	1	0	0	0	2	2
15–19	1	0	1	0	0	2	2
20–24	7	5	0	0	0	12	12
25–29	4	3	1	1	1	10	5
30–34	4	5	1	1	4	15	5
35–39	9	5	3	0	2	19	13
40–44	7	5	4	3	0	19	12
45–49	6	3	12	0	0	21	15
50–54	6	2	14	0	1	23	18
55–59	3	4	15	0	1	23	16
60–64	1	0	9	2	0	12	7
65–69	0	0	6	0	0	6	6
70–74	0	0	5	0	0	5	5
75+	0	0	2	0	0	2	0

accommodation such as motels, hostels and backpacker accommodation (5.26%).

Information included in the coroners' findings reports was sufficient for assessing amenable mortality in 153 cases of death. According to the amenable mortality list, the categories of death from unascertained and criminal nature were excluded (n=16), as well as death from natural causes that occurred beyond 75 years old (n=2). The contribution of amenable death to the overall mortality of homeless people was extreme, with 75.8% of deaths (n=118) considered as amenable to timely and effective healthcare intervention. The mean age of amenable death was 45.4 years old (Table 1). In the group aged up to 24 years, the prevalence of amenable mortality was 100%, due to suicide and accidents (Table 1). Among amenable deaths, 45.7 % (n=54) resulted from a natural cause, particularly cardiovascular disease (n=33), alcohol-related death (n=7) and pneumonia (n=6). A single case was cancer related; however, the post-mortem forensic examination diagnosed four cases of cancers at an advanced

stage. Suicide represented 41.5% of the amenable deaths (n=49), and accidents related to a vehicle crash or pedestrians struck (n=12) or resulting from fire effects (n=3) accounted for 12.7% of all amenable deaths (Table 2).

Nearly half of the amenable deaths from natural causes occurred in public spaces (46.1%), followed by deaths in private dwellings (21.1%), in cars or campervans (17.3%), in hospital (15.38%) and, lastly, in temporary accommodation (7.6%). Most of the homeless persons who died from an amenable death were alone at the time of death and were found deceased by witnesses sometimes several months after that death occurred.

Suicide (Table 3)

One of the main causes of death was suicide, accounting for 28.6% of all deaths (Table 1). In those under 44 years of age, over two-thirds of deaths were due to suicide (67.3%). Homeless persons who self-harmed were found mainly in public spaces (67.3%) or in their private vehicles

Table 2: Amenable mortality within the homeless population (modified from Otalunde et al and New Zealand Ministry of Health, 2016).

Group	Condition	Age	ONS UK-2016	NZ-MOH-2016	Amenable mortality (N=118)
Infections	Tuberculosis	0–74	A15-A19, B90	A15-A16	0
	Meningococcal disease	0–74	n/a	n/a	0
	Pneumococcal disease	0–74	A40.3, G.001, J.13	A40.3, G.001, J.13	n/a
	HCV	0–74	B17.1, B18.2	B17.1, B18.2	0
	HIV/AIDS	All	B20-B24	B20-B24	0
	Other selected bacterial infections	0–74	A.38-A41, A46, A48.1, B50-B54, G00, G03, J02, L03	n/a	n/a
Neoplasms	Stomach	0–74	C16	C16	0
	Colon	0–74	C18	n/a	1
	Rectal	0–74	C19-C21	C19-C21	0
	Bone and cartilage	0–74	n/a	C40-C41	0
	Melanoma	0–74	C43	C43	0
	Female breast cancer	0–74	C50	C50	0
	Cervical	0–74	C53	C53	0
	Uterus	0–74	C54-C55	C54-C55	0
	Prostate	0–74	n/a	C61	0
	Testis	0–74	C62	C62	0
	Thyroid	0–74	C73	C73	0
	Hodgkin	0–44	C81	C81	0
	Acute lymphoblastic leukaemia	0–74	C91, C92.0	C 91	0
	Liver	0–74	C22	n/a	0
	Mesothelioma	0–74	C45	n/a	0
	Bladder	0–74	C67	n/a	0
	Benign neoplasms	0–74	D10-D36	n/a	0
	Lip, oral cavity, pharynx	0–74	C00-C14	n/a	0
	Oesophagus	0–74	C15	n/a	0
	Trachea, bronchus, lung	0–74	C33-C34	n/a	0

Table 2: Amenable mortality within the homeless population (modified from Otalunde et al and New Zealand Ministry of Health, 2016) (continued).

Endocrine and metabolic	Diabetes mellitus	0–74	E10-E14	E10-E14	2
	Disease of thyroid	0–74	E00-E07	n/a	0
	Addison's disease	0–74	E27.1	n/a	0
Drug use disorders	Alcohol-related disease	0–74	F10, G31.2, G62.1, I42.6, K29.2, K70, K73, K74 9excl. K74.3-K74.5), K86	n/a	7
	Illicit-drug disorders	0–74	F11-F16, F18-F19	n/a	0
Neurological	Epilepsy	0–74	G40-G47	n/a	0
Cardiovascular	Rheumatic and other valvular heart diseases	0–74	I01-I09	I01, I05-I09, I33-I37	0
	Hypertensive disease	0–74	I10-I15	I10-I13	1
	Ischaemic heart disease	0–74	I20-I25	I20-I25	19
	DVT with pulmonary embolism	0–74	I26, I80.1-I80.3, I80.9, I82.9	I26	3
	Atrial fibrillation and flutter	0–74	n/a	I48	0
	Heart failure	0–74	n/a	I50	6
	Cerebrovascular disease	0–74	I60-I69	I60-I69	1
	Aortic aneurysm and dissection	0–74	I71	n/a	3
Respiratory	Influenza	0–74	J09-J11	n/a	0
	Pneumonia	0–74	J12-J18	n/a	6
	COPD	0–74	J40-J44	J40-J44	0
	Asthma	0–74	J45-J46	J45-J46	2

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Table 2: Amenable mortality within the homeless population (modified from Otalunde et al and New Zealand Ministry of Health, 2016) (continued).

Digestive disorders	Gastric and duodenal ulcer	0–74	K25-K28	K25-K27	3
	Acute abdomen, appendicitis, intestinal obstruction, pancreatitis, hernia	0–74	K35-K38, K40-K46, K83, K85, K86.1-K86.9, K91.5	n/a	0
	Cholelithiasis	0–74	K80	K80	0
Genitourinary disorders	Renal failure	0–74	N17-N19	N17-N19	0
	Nephritis and nephrosis	0–74	N00-N07, N25-N27	n/a	0
	Obstructive uropathy and prostatic hyperplasia	0–74	N13, N20-N21, N35, N40, N99.1	n/a	0
Injuries	Transport accidents	All	V01-V99	V01-V99 (excluded trains)	12
	Accidental falls on same level	All	W00-X59	W00-W008, W18	0
	Suicide	All	X60-X84, Y10-Y34	X60-X84	49
	Fire (burns)	All		X00-X09	3
	Homicide/ assault X85-Y09, U50.9	All	X85-Y09, U50.9	n/a	0

Table 3: Circumstances of death by suicide.

	N=49	%
Sociodemographic		
Age in years (median range)	38.2 (14–61)	
Male gender	41	85.7
Clinical diagnosis		
Psychosis	5	10.2
Bipolar disorder	5	10.2
Depressive illness	23	46.9
Problematic alcohol use	18	36.7
Drug use (casual/regular)	19	38.7
No history of mental health issues	8	16.3
Other	2	4
Unknown	3	6.1
Current or past treatment for mental health issues	23	46.9
Past expression of suicide thoughts and behaviours		
Communicated suicide intent (lifetime)	34	69.3
Communicated suicide intent (last year)	10	20.4
Suicide attempt (lifetime)	14	28.5
Suicide attempt (last year)	6	12.2
Suicide notes	2	4
Contact with health professionals		
Contact up to one year	6	12.2
Contact last month	12	24.4
Contact last year	14	28.5
No contact at all	11	22.4
Unknown	5	10.2
Suicide method		
Hanging	30	61.2
Self-poisoning	10	20.4
Jump/fall	5	10.2
Other methods	4	8.1

Table 3: Circumstances of death by suicide (continued).

Suicide location		
Public space	33	67.3
Vehicle	6	12.2
Temporary accommodation	5	10.2
Private dwelling	4	8.1
Hospital	1	2
Stressful life events		
Any events	34	69.3
Relationships breakdown	12	24.4
Financial problems	12	24.4
History of legal issues	7	14.2
Conflict with other persons	7	14.2
Bereavement	5	10.2

(12.2%), while 10.2% died in temporary accommodations and 8.16% in private garages. One person died in hospital from the direct consequences of suicide. Hanging was the most common method used (61.2%). The coroners' inquiries have revealed that 73.4% of homeless persons who committed suicide were diagnosed with mental health issues, mainly from alcohol or drug misuse and depressive mood disorders. However, the proportion of homeless persons treated for psychiatric disorders was less than half (46.9%). In addition, there was only evidence of recent contact with health professionals in just under a quarter of cases (24.4%). In the majority of cases (40.8%), the final contact was up to one year or more prior to death, and 22.4% of homeless persons had no contact at all with health professionals. References to lifetime suicide ideation and past suicide attempts were drawn from statements from relatives and health professionals. Nearly 70% of homeless persons had communicated suicide intent in their lifetime (69.3%), and 28.5% had evidence of prior self-harm. In nearly 70% of cases, homeless people had experienced significant and multiple stressful and traumatic life events.

Discussion

The main findings of this study are the devastating and dehumanising consequences of homelessness that result in premature and preventable deaths. The mean age of death of homeless persons identified in the sample as having "no fixed abode" at the time of death was over 30 years younger than in the New Zealand housed population, with an overall mean age of death of 45 years, reduced further to 38 years in cases of suicide.[25] The vast majority of deaths occurred in public spaces or in private vehicles. Just over three-quarters of homeless persons died from conditions amenable to timely and effective healthcare interventions, mainly from natural causes of death and suicide.

Our findings are consistent with previous results showing that premature and amenable mortality associated with homelessness is considerable, although exact comparisons cannot be made due to the variety of data sources and definitions of homelessness.[7,26–27] However, congruent to our results, prior homeless coronial samples indicate an average age of death of 46 years for all causes[26] and from nearly 36 to 39

years by suicide.[19,28] Cross-sectional studies of homeless deaths identified by linking hospital admissions and mortality data in England and New Zealand found a mean age of death of 52 years, which remains extremely young.[7–8] These studies included homeless patient samples who had been hospitalised and therefore may have benefited from medical follow-up.

The amenable mortality burden uncovered in our study is significantly higher than in a UK study that assessed this proportion to be approximatively one-third.[7] The UK study focused on the deaths of homeless patients admitted to hospitals that provided links with community healthcare services. Further, our findings were based on an extended list of amenable causes of death in a way that more clearly reflects the medical conditions associated with homeless deaths. The difference between the two amenable mortality lists was relevant in 23 cases and was mainly related to alcohol diseases, acute and treatable pneumonias and specific cardiovascular diseases (eg, heart failure and aortic dissection). We reported minimal rates of diabetes and cancers, which contradicts previous international and New Zealand hospital-based studies.[7–8] It is likely that many such cases would not be reported to the coroner, thus illustrating the differences in sampling. The magnitude of social isolation and disconnection from the health system, combined with chronic psychological distress and unstable life conditions, negatively affects the health-seeking behaviours of homeless people.[29–30] For homeless people, the difficulties of accessing basic human needs compete with the drive to access health and operate as significant additional stressors to receiving care.[29] Further, it is likely that the patients with "no fixed abode" cannot be registered with a general practitioner, because of a lack of address and that the cost for the co-payment within primary care is a further barrier to accessing regular care. Our findings are sadly aligned with extant literature and reiterate the pressing need for improving the accessibility to healthcare for homeless people.[30]

Of particular concern, and in line with other findings, suicide was prevalent among homeless youth and young adults.[28] In addition, the prevalence of lifetime suicide ideation (69.3%) was significantly higher than those of depressive disorders (46.9%). Yet, in the context of homelessness, research identifies that suicide ideation is a more sensitive indicator of acute risk of suicide than depressive symptomatology, in comparison to the general population.[31–33] Abuse and trauma especially are recognised as being major pathways to homelessness and strong predictors of suicide ideation among homeless adults and youth, which is intensified by different sources of emotional distress when living on the streets.[32–35] We found that nearly 70% of cases had evidence of stressful and traumatic life events that reverberate through the rate of suicide ideation we uncovered. Hence, we would argue that assessing suicide ideation should be part of routine screening provided by health providers in contact with homeless patients.

The strengths of this study include detailed data on the deaths of a group of patients who are often hard to identify from routine data sources. Our sample included homeless persons who did not receive regular healthcare, and this reflects the considerable challenges of meeting the healthcare needs among this population. It has been argued that the concept of amenable mortality suffers from a lack of accurate determination of the underlying cause of death.[13] By using findings from forensic examinations, this pitfall has been avoided. The study has some limitations. The study focused on a specific subset of homeless people identified as having "no fixed abode" at the time of death. People living in transitional housing, motels or private dwellings are provided with an address and have not been identified. Thus, our findings are relevant to those who were the most isolated and deprived in terms of support and access to healthcare, as is suggested by the extremely low rate of deaths in hospital settings for a population without a home. It is also conceivable that some relevant coroners' reports could have been missed. The proportion of natural causes differs significantly from previous hospital-based studies in England and New Zealand that evidenced cardiovascular diseases, cancers and respiratory diseases as being the main underlying causes of deaths.[7–8] Our sample framing relied on deaths that must be legally

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reported to coroners due to their violent or undetermined causes, and which represented nearly half of all deaths. This has likely led us to underestimate the contribution of natural causes of deaths to the overall mortality. Ethnicity was not individually reported on the coroners' findings, meaning that data regarding Māori and Pasifika people, who are mainly impacted by homelessness within New Zealand, were not available.[1]

Implications and need for future research

Our findings carry important implications for the development of health policy to enable earlier identification of homeless patients at high risk of premature mortality. This involves enhancing access to care, as well as providing the continuity and quality of care for homeless people with life-limiting conditions. Considering cardiovascular disease and suicide are leading causes of amenable mortality, regular access to a source of care is an imperative for this population. Within primary care, access to homeless-tailored services that emphasise outreach programmes and free care delivery has shown positive outcomes in terms of accessibility and continuity of care, and should therefore be facilitated.[36] Components of an effective response should also promote a holistic and patient-centred approach (or whānau-centred approach if appropriate) to support self-esteem recovery.[29] Treatment plans that actively encourage the participation of the homeless patients are needed to ensure adherence to care and follow-up. A first step in this direction could be to implement homeless-sensitive care training programmes for health providers within primary care and emergency departments, with special attention given to suicide ideation identification. For homeless patients with mental health issues or dual diagnoses, assertive community treatment seems the most encouraging response regarding regularity of health contacts and housing stability.[37]

That said, many homeless people are not mentally ill or substance users. Future research should assess more specifically healthcare utilisation and access barriers in various settings and for different subgroups of the homeless population. Lastly, this study has also provided the opportunity to highlight the lack of systematic capture of homelessness through different administrative data sets, other than by using a reductive identification of homeless persons by the "no fixed abode" criterion. Equally important, the use of the Z.590 code should be encouraged within DHBs, including during the completion of the Medical Certificate of Cause of Death, if we are to understand how to adequately and effectively improve the healthcare of the homeless population. This would be facilitated if the Law Commission's recommendations for modernising the legislation relating to death, burial, cremation and funerals in New Zealand became the responsibility of the Ministry of Health.[38] This should allow for a better recording of homeless deaths and would also ensure better recording of ethnicity data.

Conclusion

Homeless people experience considerable challenges when accessing the healthcare system, as uncovered by the dramatic rate of amenable mortality. Our findings outline the pressing necessity to implement specific models of care that are designed to meet the social and healthcare needs of homeless persons and address the significant health inequalities they face. This research highlighted an extreme situation of social isolation and disengagement from the healthcare system that point out the challenges of accessing regular sources of care and receiving comprehensive and culturally sensitive care. Future work should provide a more comprehensive picture of healthcare utilisation for the diverse groups of homeless patients, to assist policy decisions as part of comprehensive and effective response to homelessness.

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