

# An Observational Study of Suicide Death in Homeless and Precariously Housed People in Toronto

Une étude d'observation des décès par suicide chez les personnes sans abri et au logement précaire de Toronto

Mark Sinyor, MD, FRCPC<sup>1</sup>, Nicole Kozloff, MD, FRCPC<sup>2</sup>,  
Catherine Reis, BA<sup>1</sup>, and Ayal Schaffer, MD, FRCPC<sup>1</sup>

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## Abstract

**Objective:** Homelessness has been identified as an important risk factor for suicide death, but there is limited research characterising homeless people who die by suicide. The goal of this study is to identify personal, clinical, and suicide method-related factors that distinguish homeless and precariously housed people who die from suicide from those who are not homeless at the time of suicide.

**Methods:** Coroner records were reviewed for all suicide deaths in Toronto from 1998 to 2012. Data abstracted included housing status as well as other demographics, clinical variables such as the presence of mental illness, and suicide method.

**Results:** Of 3319 suicide deaths, 60 (1.8%) were homeless and 230 (6.9%) were precariously housed. Homeless and precariously housed people were each younger than nonhomeless people ( $P < 0.0001$ ). Compared with nonhomeless, homeless people were more likely to be male and less likely to be married, to have interpersonal conflict, or to leave a suicide note. Homeless people and precariously housed were more likely to have died by fall/jump than nonhomeless people (62%, 57%, and 29%, respectively).

**Conclusions:** Homeless and precariously housed people are overrepresented among suicide deaths in a large urban center and differ demographically, clinically, and in their suicide method from nonhomeless people who die by suicide. Targeted suicide prevention strategies should aim to address factors specific to homeless people.

## Abrégé

**Objectif :** L'itinérance a été identifiée comme étant un facteur de risque important pour les décès par suicide mais la recherche caractérisant les personnes sans abri qui meurent par suicide est limitée. Le but de cette étude est d'identifier les facteurs personnels, cliniques et liés à la méthode de suicide qui distinguent les personnes sans abri et au logement précaire qui meurent par suicide de celles qui ne sont pas sans abri au moment du suicide.

**Méthodes :** Les dossiers du coroner ont été examinés pour tous les décès par suicide de Toronto, de 1998 à 2012. Les données prélevées incluaient l'état du logement et d'autres données démographiques, des variables cliniques comme la présence de maladie mentale, et la méthode de suicide.

**Résultats :** Sur 3 319 décès par suicide, 60 (1,8 %) étaient sans abri et 230 (6,9 %) avaient un logement précaire. Les personnes sans abri et au logement précaire étaient dans les deux cas plus jeunes que les personnes non sans abri ( $P < 0,0001$ ).

<sup>1</sup> Mood and Anxiety Disorders Program, Department of Psychiatry, Sunnybrook Health Sciences Centre, University of Toronto, Toronto, Ontario

<sup>2</sup> Centre for Urban Health Solutions, Li Ka Shing Knowledge Institute, St. Michael's Hospital, Toronto, Ontario

## Corresponding Author:

Mark Sinyor, MD, FRCPC, Department of Psychiatry, Sunnybrook Health Sciences Centre, University of Toronto, 2075 Bayview Avenue, FG52, Toronto, ON M4N 3M5, Canada.

Email: mark.sinyor@sunnybrook.ca

Comparativement aux non sans-abri, les personnes sans abri étaient davantage de sexe masculin, moins susceptibles d'être mariées, d'avoir un conflit interpersonnel ou de laisser une note de suicide. Les personnes sans abri et au logement précaire étaient plus susceptibles d'être décédés par une chute ou un saut que les non sans-abri (62 %, 57 % et 29 % respectivement).

**Conclusions :** Les personnes sans abri et au logement précaire sont surreprésentées parmi les décès par suicide d'un grand centre urbain, et diffèrent démographiquement, cliniquement et par leur méthode de suicide des personnes non sans abri qui meurent par suicide. Les stratégies ciblées sur la prévention du suicide devraient tenter de tenir compte des facteurs spécifiques aux personnes sans abri.

### Keywords

suicide, homeless, precariously housed

Homelessness carries a 2- to 6-fold increased risk of suicide compared to the general population.<sup>1-5</sup> Despite this, research on suicide death in homeless people is limited and has been identified as an area of need.<sup>1</sup> Homeless people are more likely, compared to others who died by suicide, to be younger, unmarried, non-Indigenous, and unemployed; to use alcohol and/or drugs; to have stressful life events; and to be have physical illness and untreated mental illness.<sup>1,6,7</sup> Schizophrenia and mood, personality, and substance use disorders are all strongly associated with suicide in this population.<sup>8</sup> Acknowledging the challenges inherent to studying homeless people, it has nevertheless been argued that we need better, evidence-based estimates of suicide rates in homeless people and, in addition to the research that has characterised those with suicidal ideation and attempts, a clearer picture of those within this population who die by suicide.<sup>4</sup> We are not aware of any studies that have described suicide deaths across the spectrum of housing status in a North American setting. As Canada's largest city, Toronto is home to a considerable number of homeless people with point-in-time counts suggesting that there are approximately 5000 at a given time, accounting for 0.2% of Toronto's population.<sup>9</sup> The present analysis will draw from a larger study, using coroner records to examine all suicide deaths in Toronto from 1998 to 2012, to determine the proportion of deaths that occur in homeless and precariously housed people as well as to characterise these groups. A precariously housed group was included in addition to homeless and non-homeless groups in recognition of the fact that homelessness lies on a continuum<sup>10</sup> and that tenuous housing status may affect suicide risk.

### Method

This work is part of the larger Toronto Analysis of Suicide for Knowledge and Prevention (TASK-P) study, and the details and methods of data collection have been published previously.<sup>11</sup> Records from the Office of the Chief Coroner of Ontario (OCC) were reviewed for the 3319 deaths in the city of Toronto ruled as suicides from 1998 to 2012. Demographic, clinical, and suicide-specific data were collected from the coroner's charts for all suicides by the primary investigator (MS) and 2 research assistants. Each chart contained a coroner's investigation report, which included a

determination of death, a pathology report, and commonly other sources of information such as police reports, letters from/interviews with family members or physicians, and copies of suicide notes. Housing status was defined according to OCC investigations of living circumstances, which are present in all charts: homeless was defined as having no fixed address and no last known residence or staying in emergency housing for the homeless such as a shelter; precariously housed was defined as having no fixed address and staying in a temporary location, including "couch-surfing," a hotel, hospital, or jail.

Statistical analysis was performed using IBM SPSS Statistics 24 (SPSS, Inc., an IBM Company, Chicago, IL). Chi-square or Monte Carlo Fisher exact test analyses were conducted for bivariate comparisons on categorical variables. A 1-way analysis of variance (ANOVA) was conducted to test for significant differences in continuous variables with *t* tests for pairwise comparisons between groups. When indicated, the Welch-Satterthwaite method was conducted.

### Results

Of 3319 suicide deaths in Toronto, 60 people (1.8%) were homeless, 230 (6.9%) were precariously housed, and 3029 (91.3%) were nonhomeless. Personal and clinical variables, as well as suicide methods for each group, are shown in Table 1. Homeless people were younger and more likely to be male than nonhomeless ( $38.9 \pm 12.7$  years vs.  $47.7 \pm 17.8$  years,  $P < 0.0001$ ; 83.3% vs. 70.0% male,  $P = 0.031$ ). Homeless people were much less likely to be married or to have interpersonal conflict (both  $n < 5$ , exact numbers suppressed). Rates of any mental illness (72.7%), depression (54.8%), and identified comorbid medical conditions (35.2%) were highest in nonhomeless and lowest in homeless people (40.0%, 20.0%, and  $n < 5$ , respectively). Homeless people were least likely to leave a suicide note ( $n < 5$ ). Homeless people were most likely to have been seen by an emergency department or outpatient psychiatrist in the week prior to suicide (15.0% compared with 7.7% of nonhomeless,  $P = 0.049$ ).

Precariously housed people were younger than nonhomeless ( $41.5 \pm 14.7$  years vs  $47.7 \pm 17.8$  years,  $P < .0001$ ) and were most likely to have interpersonal conflict (23.5%).

**Table 1.** Global and Pairwise Comparisons of Personal and Clinical Factors as Well as Suicide Methods among Homeless, Precariously Housed, and Nonhomeless Persons Who Died by Suicide in Toronto, Canada, 1998-2012.

Variable	Homeless <sup>a</sup> (n = 60)	Precariously- Housed <sup>b</sup> (n = 230)	Non- Homeless <sup>c</sup> (n = 3029)	Global Test of Significance		Post Hoc Tests					
						Homeless vs. Precariously Housed		Homeless vs. Nonhomeless		Precariously Housed vs. Nonhomeless	
				F	P Value	t	P Value	t	P Value	t	P Value
<b>Personal factors</b>											
Age, mean (SD), y	38.9 (12.7)	41.5 (14.7)	47.7 (17.8)	20.0	<0.0001	1.25	0.211	5.25 <sup>d</sup>	<0.0001	6.07 <sup>d</sup>	<0.0001
				$\chi^2$	P Value	$\chi^2$	P Value	$\chi^2$	P Value	$\chi^2$	P Value
Sex (% male)	83.3	75.7	70.0	7.93	0.019	1.60	0.230	4.96	0.031	3.20	0.084
Marital status (% married)	— <sup>e</sup>	22.6	26.4	20.10	<0.0001	13.97	<0.0001	18.76	<0.0001	1.60	0.214
Past suicide attempts (% yes)	16.7	23.5	27.8	6.62	0.158						
Outpatient psychiatry/ emergency room visit in past week (%)	15.0	10.4	7.7	6.12	0.047	.98	0.361	4.30	0.049	2.15	0.162
Comorbid substance abuse (% drug or alcohol)	23.3	19.1	20.4	.55	0.760						
Comorbid medical condition (%)	— <sup>e</sup>	15.2	35.2	60.56	<0.0001	4.36	0.051	23.74	<0.0001	38.24	<0.0001
Interpersonal: conflict or relationship breakup (%)	— <sup>e</sup>	23.5	23.3	11.17	0.004	10.29	0.002	11.15	0.001	.003	1.000
<b>Clinical factors</b>											
Depression (%)	20.0	40.4	54.8	44.61	<0.0001	8.60	0.004	28.64	<0.0001	17.67	<0.0001
Bipolar (%)	— <sup>e</sup>	4.8	6.4	1.84	0.398						
Schizophrenia (%)	— <sup>e</sup>	10.9	6.4	7.02	0.030	.33	0.643	.363	0.590	6.80	0.011
Any mental illness (%)	40.0	62.4	72.7	36.22	<0.0001	9.25	0.003	31.24	<0.0001	10.80	0.001
Presence of a suicide note (%)	— <sup>e</sup>	20.9	32.3	27.86	<0.0001	5.01	0.037	15.60	<0.0001	12.99	<0.0001
<b>Suicide method</b>											
Hanging (%)	18.3	20.4	31.0	15.42	<0.0001	.13	0.857	4.45	0.047	11.37	0.001
Other asphyxia (%)	— <sup>e</sup>	2.6	7.8	11.27	0.004	.18	1.000	3.10	0.085	8.30	0.004
Drowning/ hypothermia (%)	— <sup>e</sup>	10.0	1.7	67.70	<0.0001	2.69	0.124	1.00	0.625	67.96	<0.0001
Self-poisoning (%)	11.7	3.0	21.4	47.65	<0.0001	7.70	0.012	3.33	0.078	44.79	<0.0001
Fall/jump (%) <sup>f</sup>	61.7	58.7	28.9	113.66	<0.0001	.17	0.768	30.39	<0.0001	88.84	<0.0001
Shooting (%)	0.0	2.6	4.8	5.34	0.069						
Cutting/stabbing (%)	— <sup>e</sup>	— <sup>e</sup>	3.3	2.86	0.239						

Note:  $\chi^2$  tests were valid throughout; therefore, no Monte Carlo Fisher exact tests are presented.

Bolded *P* values represent tests that reached statistical significance.

<sup>a</sup>People who died from suicide with no fixed address and who had no place of last known residence or were staying in temporary housing for the homeless such as a shelter.

<sup>b</sup>Those who were known to be staying at a temporary location, including "couch-surfing," a hotel, hospital, or jail and had no fixed address.

<sup>c</sup>All those with a fixed address/clear living circumstances.

<sup>d</sup>Welch-Satterthwaite method.

<sup>e</sup>Suppressed due to small numbers.

<sup>f</sup>Includes jump and/or fall from building/bridge as well as subway/railway.

Schizophrenia was more prevalent in precariously housed (10.9%) compared to nonhomeless people (10.9% vs 6.4%,  $P = 0.01$ ).

Homeless and precariously housed people were approximately twice as likely to have died by fall/jump than nonhomeless people (both  $P < 0.0001$ ).

## Discussion

The present study highlights the important contribution of homelessness to suicide deaths in North America's fourth largest city by population. Homeless and precariously housed individuals accounted for 9% of all suicide deaths in Toronto over a 15-year period. They are therefore over-represented in suicide death counts 10-fold, which is consistent with previous studies in other locations.<sup>1-3</sup>

We found that 83% of homeless people who died by suicide in Toronto were male, which is consistent with data from other countries.<sup>1,7</sup> Rates of being married and of interpersonal conflict and/or relationship breakups, which were low in homeless people, were notably similar between precariously housed and nonhomeless people. Relationship problems have been cited by recently homeless adults as a main pathway into homelessness; we speculate that this may be true for the precariously housed individuals who died by suicide in our sample, for whom relationship conflict may have contributed to their housing difficulties and to their suicides.<sup>12</sup> Both social connectivity and access to support services for the homeless have been shown to independently predict well-being.<sup>13</sup> Furthermore, a study that examined suicidal ideation longitudinally among homeless people with mental illness randomised to a housing and psychosocial intervention or treatment as usual found that suicidal ideation diminished over time in both groups.<sup>14</sup> In addition to regression to the mean, the authors also attributed these results to increased social connectivity mediated by interaction with the researchers, providing further suggestion that addressing social marginalisation and isolation has the potential to decrease suicide death in homeless people. We speculate that the finding that very few homeless people in the current study left suicide notes may at least partially reflect low social connectivity in this group. That is, many may have felt there was no one to leave a message for.

Differences in suicide methods likely relate to availability, with jumping in front of subways and from high places such as bridges accounting for the majority of deaths in homeless and precariously housed people. This highlights the need for restriction strategies, for example, barriers on subways and bridges, which have been shown to reduce suicide deaths<sup>15</sup> and may preferentially affect these groups. The fact that homeless people had a higher rate of physician contact in the week prior to suicide presents another potential opportunity for intervention in which providers could make greater efforts to improve social isolation and to connect homeless people to support services.

This study has important limitations. First, it relies on the coroner's data, which are sometimes limited in clinical detail. Investigations of death in homeless people may be particularly vulnerable to missing data because they may be less likely to have next of kin to provide information or to have a regular physician to detect physical or mental disorders.<sup>16</sup> The lower rates of both mental and physical illness in homeless people, for example, should be interpreted with

caution given that previous studies have reported the opposite relationship<sup>1</sup> and given that the overall rate of mental illness is approximately 20% lower than what has been observed in other large population studies<sup>5</sup>; it should be assumed that the presence of mental disorders was under-detected in homeless people and reflects a need for improved surveillance of mental disorders in this population rather than the relative absence of them. While the coroner systematically collects data on last place of residence, in some cases, this information may fail to accurately capture a person's living situation and may have led to the assignment of some deaths into the wrong group. Variable selection was also constrained by the data reported in the coroner's records, and other salient factors could not be examined because they were not systematically available. These include previous/ongoing mental health care prior to the past week or a person's social milieu beyond marital status. This study is also limited by the lack of a living control group. Therefore, while we present observational data to characterise homeless people who died from suicide, future studies should aim to identify which homeless people are at greatest risk. While it is not possible to determine whether results in Toronto may be generalizable to other cities and countries, as a large multicultural city that includes ethnic groups from around the world, we speculate that the findings here are likely to be applicable elsewhere.

This study examined a large number of suicide deaths in homeless and precariously housed people in a major urban center. The findings suggest that homeless and precariously housed people who die from suicide are distinct from one another and from nonhomeless people who die from suicide. In contrast to the general population, for whom older age is an established risk factor for suicide, our findings agree with previous literature that homeless people who die from suicide tend to be younger.<sup>1,3,5</sup> Precariously housed people also have some similarities to nonhomeless people in terms of marital status and interpersonal conflict as a proximate factor in suicide death, suggesting that attention should be paid to relationship difficulties in those who are precariously housed.

This study identifies a need for interventions in homeless and precariously housed populations for suicide prevention. Given that suicide deaths are overrepresented among homeless and precariously housed people, greater efforts at engagement and targeted prevention in these groups, including access to mental health services and programs focused on social connectedness, physician suicide risk assessment and suicide prevention barriers on bridges and subways are warranted.

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## Ethical Approval

This study was approved by the Sunnybrook Health Sciences Centre research ethics board (ID 021-2011).

## References

1. Arnautovska U, Svetlicic J, De Leo D. What differentiates homeless persons who died by suicide from other suicides in Australia? A comparative analysis using a unique mortality register. *Soc Psychiatry Psychiatr Epidemiol*. 2014;49(4):583-589.
2. Hwang SW, Wilkins R, Tjepkema M, et al. Mortality among residents of shelters, rooming houses, and hotels in Canada: 11 year follow-up study. *BMJ*. 2009;339:b4036.
3. Nordentoft M, Wandall-Holm N. 10 year follow up study of mortality among users of hostels for homeless people in Copenhagen. *BMJ*. 2003;327(7406):81.
4. Christensen RC, Garces LK. Where is the research on homeless persons and suicide? *Psychiatr Serv*. 2006;57(4):447.
5. Nielsen SF, Hjorthøj CR, Erlangsen A, et al. Psychiatric disorders and mortality among people in homeless shelters in Denmark: a nationwide register-based cohort study. *Lancet*. 2011;377(9784):2205-2214.
6. Barak Y, Cohen A, Aizenberg D. Suicide among homeless people: a 9-year case-series analysis. *Crisis*. 2004;25(2):51-53.
7. Bickley H, Kapur N, Hunt IM, et al. Suicide in homeless people within 12 months of contact with mental health services: a national clinical survey in the UK. *Soc Psychiatry Psychiatr Epidemiol*. 2006;41(9):686-691.
8. Feodor Nilsson S, Hjorthøj CR, Erlangsen A, et al. Suicide and unintentional injury mortality among homeless people: a Danish nationwide register-based cohort study. *Eur J Public Health*. 2014;24(1):50-56.
9. Gaetz S, Donaldson J, Richter T, et al. The state of homelessness in Canada 2013. Toronto (Ontario): Canadian Homelessness Research Network Press; 2013.
10. Echenberg H, Jensen H. Defining and enumerating homelessness in Canada. Library of Parliament, 2012 [cited 2017 Feb 23]. Available from: <http://www.lop.parl.gc.ca/content/lop/ResearchPublications/prb0830-e.htm>.
11. Sinyor M, Schaffer A, Streiner D. Characterizing suicide in Toronto: an observational study and cluster analysis. *Can J Psychiatry*. 2014;59(1):26-33.
12. van Laere IR, de Wit MA, Klazinga NS. Pathways into homelessness: recently homeless adults problems and service use before and after becoming homeless in Amsterdam. *BMC Public Health*. 2009;9:3.
13. Walter ZC, Jetten J, Dingle GA, et al. Two pathways through adversity: predicting well-being and housing outcomes among homeless service users. *Br J Soc Psychol*. 2016;55(2):357-374.
14. Noël F, Moniruzzaman A, Somers J, et al. A longitudinal study of suicidal ideation among homeless, mentally ill individuals. *Soc Psychiatry Psychiatr Epidemiol*. 2016;51(1):107-114.
15. Pirkis J, Spittal MJ, Cox G, et al. The effectiveness of structural interventions at suicide hotspots: a meta-analysis. *Int J Epidemiol*. 2013;42(2):541-548.
16. Khandor E, Mason K, Chambers C, et al. Access to primary health care among homeless adults in Toronto, Canada: results from the Street Health survey. *Open Med*. 2011;5(2):e94-e103.