BMJ Open

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Journal:	*BMJ Open*
Manuscript ID	bmjopen-2018-024748
Article Type:	Research
Date Submitted by the Author:	16-Jun-2018
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Keywords:	Indigenous health, Homelessness, substance use, service use, health equity, MENTAL HEALTH

The Distinct Service Needs of Indigenous People Experiencing Homelessness and Mental Illness in Two Canadian Cities: Evidence to Support Culturally Informed Responses

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Word Count Abstract: 243

Word Count Body: 3592

Key words: homelessness, Indigenous, mental health, substance use, service use

ABSTRACT
OBJECTIVES:
Indigenous people in Canada are not only overrepresented among the homeless population but their pathways to homelessness may differ from those of non-Indigenous people. This study investigated the history and current status of Indigenous and non-Indigenous people experiencing homelessness and mental illness. We hypothesized that compared to non-Indigenous people, those who are Indigenous would demonstrate histories of displacement earlier in life, higher rates of trauma and self-medication with alcohol and other substances.
METHODS: Retrospective data were collected from a sample recruited in Winnipeg and Vancouver. Eligibility included being 19 years or older, current mental disorder and homelessness. Univariate and multivariable models were used to model the association between Indigenous ethnicity and dependent variables.
RESULTS: A total of 1010 people met inclusion criteria, of whom 439 self-identified as Indigenous. In adjusted models, Indigenous ethnicity was independently associated with being homeless at a younger age, having a lifetime duration of homelessness longer than 3 years, post-traumatic stress disorder, less severe mental disorder, more severe substance use in the past month and infectious disease. Indigenous participants were also nearly twice as likely as others (47% vs. 25%) to have children younger than 18 years.
CONCLUSIONS: Among Canadians who are homeless and mentally ill, those who are Indigenous have distinct histories and current needs that are consistent with the legacy of colonization. Responses to Indigenous homelessness must be developed within the context of reconciliation between Indigenous and non-Indigenous Canadians, addressing trauma, substance use, and family separations.

Strengths and Limitations of this Study:

- A large sample and validated self-report measures.
- First investigation of distinct needs among homeless people related to Indigenous ethnicity.
- Demonstration that Indigenous and non-Indigenous homeless individuals have needs that correspond to differences in their historical experiences.
- Recollection of past events may have been incomplete or inaccurate.
- Symptoms of mental illness and substance use may have influenced responses.
- Indigenous ethnicity may have been underreported due to concerns regarding stigma or discrimination.

BACKGROUND

Indigenous[1] people are overrepresented among homeless populations in every part of the world where these rates are documented (1). Indigenous people struggling with mental illness, substance use or homelessness often share experiences involving structural inequities and trauma related to colonization. Despite a visible presence of Indigenous peoples in the urban homeless populations of North America, Australia and New Zealand, there is limited research investigating the prevalence and causes of Indigenous homelessness (1). Canadian data indicate that homelessness among Indigenous people is 8 times more prevalent than among non-Indigenous people (2). Indigenous Australians comprise 9% of the homeless population compared to less than 2% of the general population. Similarly, in New Zealand, Maori homelessness has been reported to be five times that of non-Maori (1).

Pathways to homelessness include poverty, mental illness, addiction, lack of affordable housing, and socio-economic inequities (3-5). More specifically, a clear link has been established between mental illness and homelessness (6,7). The deinstitutionalization of individuals with serious mental illness, combined with barriers resulting from housing policy and lack of affordable housing, has contributed to high rates of homelessness (8). Further, fragmentation between primary care, substance use and mental health systems has resulted in overall poor health for marginalized people who are struggling to find stable housing (7).

Indigenous pathways to homelessness are likely inclusive of the above factors, but are further shaped by the presence of profound intergenerational trauma, systemic racism, cultural oppression, disempowerment and dispossession of Indigenous lands (2,3,9). Compared to the general population, Indigenous people become homeless at a younger age

[1] The term 'Indigenous' will be used throughout this paper to collectively describe the Indigenous peoples of Canada, inclusive of those who identify as 'Aboriginal', or First Nations, Métis and Inuit. This term is used while also acknowledging the diversity of cultures, languages and traditions that exist among Indigenous Canadians.

and Indigenous youth are over-represented in the child welfare system (2). These differences have led to the development of a distinct definition of Indigenous homelessness in Canada: "Unlike the common colonialist definition of homelessness, Indigenous homelessness is not defined as lacking a structure of habitation; rather, it is more fully described and understood through a composite lens of Indigenous worldviews. These include: individuals, families and communities isolated from their relationships to land, water, place, family, kin, each other, animals, cultures, languages and identities. Importantly, Indigenous people experiencing these kinds of homelessness cannot culturally, spiritually, emotionally or physically reconnect with their Indigeneity or lost relationships"(10). A related insight can be found in the final report of Canada's Truth and Reconciliation Commission, which examined the urgent and complex relationships between Indigenous and non-Indigenous peoples in Canada and does not mention the term "homelessness" at all, but includes the term "home" 146 times, usually in the context of loss, and enforced separation (11).

Among relevant empirical studies, disparities have been reported concerning Indigenous peoples' access to appropriate and responsive primary health care (12). However, there are substantial gaps in research examining the implications of historical and current differences between Indigenous and non-Indigenous peoples as they relate to policies and services addressing homelessness and mental illness. In a review of the supportive housing literature, Rog and colleagues called for further research into the effects of race and ethnicity (13). Indeed, few studies have examined the potential upstream causal factors that contribute to the overrepresentation of Indigenous people among the homeless (1). Such information is essential to the development of effective policies.

The current study investigated differences between Indigenous and non-Indigenous people who experienced homelessness and mental illness, and whether differences are consistent with distinct trajectories leading to homelessness. We hypothesized that

Indigenous participants would be more likely to have experienced homelessness earlier in life and have higher prevalence of trauma and substance use, and that non-Indigenous participants would be more likely to experience serious mental illness such as schizophrenia.

METHODS

Ethics Statement

This study sample was recruited for the following experimental trials: ISRCTN42520374; ISRCTN57595077; ISRCTN66721740. All variables were collected pre-randomization. Ethical review and approval was conducted by the Research Ethics Boards at Simon Fraser University, The University of British Columbia and the University of Manitoba with endorsement from the University of Winnipeg.

Data Source and Sample

The At Home/Chez Soi study took place in five Canadian cities and enrolled participants who were homeless and mentally ill (14,15). The current study includes baseline data from Vancouver and Winnipeg, the sites with the highest proportions of Indigenous people who are homeless. Further details related to the trial protocols and methods that are not essential to the current study have been published elsewhere(14,15).

Eligibility criteria included being a legal adult (19 years or older), current mental disorder, and being absolutely or precariously housed. Absolute homelessness was defined as having no place to stay for more than seven nights and little likelihood of finding a place in the next month (14). Precarious housing referred to living in a rooming house, hotel or transitional housing, and having at least two episodes of homelessness, as defined above, in the past year (14,15). Participants were recruited through referral from diverse agencies including: homeless shelters; drop in centers; homeless outreach teams; hospitals; community mental health team and criminal justice programs. Organizations that serve

women, youth, Indigenous peoples and gay/lesbian/transgender were targeted to obtain a diverse sample.

An initial face-to-face interview was conducted to determine if referred individuals met the inclusion criteria. Upon meeting criteria, participants were enrolled and administered the baseline questionnaire that included information on socio-demographics, mental illness, substance use, physical health, service use and quality of life. Participants received a cash honorarium of $30 upon completion of the baseline interview and $20 for each subsequent interview. Results are based on data from the baseline questionnaires of 497 Vancouver participants and 513 Winnipeg participants.

Patient and Public Involvement

Indigenous people and other community stakeholders were engaged in the development and implementation of this research. Community meetings (including advertised open meetings) and six focus groups were conducted with key informants (15). In total, 58 individuals were convened and met with a facilitator who prepared reports of the proceedings. Focus group participants advised on procedures, reducing risks and maximizing benefits to participants and on how to incorporate the expertise of individuals with direct experience of homelessness into the study. Narrative feedback from participants was incorporated into the grant application and the project. Service providers were also consulted extensively during the design of the research. More specifically, in Winnipeg, where Indigenous homelessness was a specific focus, an Indigenous Research steering committee was created, comprised of elders and traditional teachers, to provide cultural advice and guidance to the research team and ensure that Indigenous perspectives were incorporated. In addition, a Lived Experience Circle (LEC) was created. The LEC specifically ensured that Indigenous lived experience perspectives were honoured and promoted through the research. In Winnipeg, patients or persons with lived experience (PWLE) were

involved in multiple roles on the project as representatives on an advisory committee and employed as research staff. PWLE assisted in facilitating integrated knowledge exchange working with staff of the interventions and directly to bring patient perspectives into the research and interventions. Since completion of the trial, across all study sites findings have been reported at a wide array of academic and non-academic research forums and have been distributed to diverse audiences including provincial governments, municipalities, health authorities and community agencies. In April 2018, a forum was held where key members of community service organizations that work with Indigenous people who are homeless and PWLE were invited to review study results and were invited to provide their recommendations and guide the interpretation of meaning. The current findings will be disseminated following publication via the established network of local service providers, stakeholders and participants of the research forum.

Variables of Interest

Indigenous or Aboriginal ethnicity status was derived from self-report. Participants were asked if they identify as "Aboriginal" and to check all that apply: Inuit, Métis, First Nations status, First Nations non-status, Indigenous from outside Canada and other. For the purposes of these analyses participants who identified as any of these categories of "Aboriginal" were considered to be Indigenous. The cluster of severe mental disorders includes at least one of current (i.e. past month) Psychotic Disorder, mood disorder with psychotic features, and hypomanic or manic episode, as identified through the MINI International Neuropsychiatric Interview (M.I.N.I.)(16). The less severe cluster includes at least one of current major depressive episode, panic disorder and posttraumatic stress disorder (PTSD). Substance dependence was assessed using the MINI and the GAIN SPS (Global Assessment of Individual Need – Substance Problem Scale), a 16 item subscale that integrates research and clinical assessment for people presenting for substance abuse

treatment (14). Frequency of use included all illicit drugs. Infectious disease was based on a positive self-report diagnosis of HIV, Hepatitis B, or Hepatitis C. Self-reported involvement with health services was collected for the past 6 months including visiting a: Family doctor, Psychiatrist, Emergency room (ER) and being transported by ambulance to an ER. Access to health care was elicited by the questions "Is there a place that you usually go to when you're sick or in need of advice about your health?" and "In the past 6 months, was there ever a time when you needed health care but you did not receive it?" Criminal justice services included: Contact with the police that did not result in arrest; contacts that resulted in arrest; or being held in a police cell for less than 24 hours. Participants were categorized as either moderate needs (MN) or high needs (HN). Inclusion in the HN category was based on a score of 62 or lower on the Multnomah Community Ability Scale (MCAS) or current bipolar or psychotic disorder as well as one of the following: legal involvement in the past year; substance dependence in the past month; and two or more hospitalizations for mental illness in the past 5 years (17,18). All other eligible participants were categorized as MN in the study(15).

Statistical Analysis

Pearson Chi-square or Fisher's exact test were used to conduct comparisons between baseline socio-demographic characteristics for Vancouver and Winnipeg participants and to make comparisons between Indigenous and non-Indigenous participants. Comparisons of numeric variables (e.g. age at enrolment) between groups were conducted using the Student t test and Wilcoxon's rank-sum test. Comparisons were conducted across socio-demographic variables, homelessness variables, mental health, substance use, health conditions and service use for individuals of Indigenous vs. non-Indigenous ethnicity. Univariate and multivariate logistic regression analyses were used to model the independent associations between Indigenous ethnicity and a series of outcome

variables. Outcome variables that were significant at the $p<0.05$ level were considered for the multivariable logistic regression analyses. The multivariable model adjusted for potentially confounding variables which may have been unevenly distributed based on ethnicity (15,19). The following controlling variables were used for the multivariable model: age (continuous); gender (man, woman); need level (high, moderate); marital status (single, other); site (Vancouver, Winnipeg); education (completed high school, incomplete high school); have children (under age 18). Both unadjusted and adjusted odds ratios and 95% Confidence intervals (CI) are reported. SPSS Version 21 was used to conduct these analyses.

RESULTS

Descriptive characteristics of participants recruited in Vancouver (n=497) and Winnipeg (n=513) are presented in Table 1. In Vancouver, the mean age of participants was 41 years (SD=11) and the majority were male (73%), White (56%), single/never married (70%), and had not completed high school (57%). In Winnipeg, the mean age of participants (n=513) was 39 years (SD=11) and the majority were male (64%), Indigenous (71%), single/never married (70%), and had not completed high school (69%). Participants at the Vancouver and Winnipeg sites significantly differed with respect to: Need level; gender; ethnicity; education; hospitalizations; arrests; housing status; mental illness severity; and suicidality ($p\leq0.05$).

Univariate comparisons between Indigenous (439) and non-Indigenous (571) samples from both study sites are presented in Table 2. The majority of Indigenous participants met criteria for the moderate needs condition (59%), were male (61%), had not completed high school (75%) and had a lifetime duration of homelessness greater than three years (52%). Compared to non-Indigenous participants, Indigenous participants were more likely to have children under the age of 18 (52% vs. 25%) and were first homeless at a younger age (63% vs. 51% reporting being first homeless before the age of 30).

Effect size estimates as unadjusted and adjusted odds ratios (UOR and AOR) and 95% confidence intervals (CI) are presented in Table 3. Results from multivariable logistic regression analyses indicate that self-reported Indigenous ethnicity independently predicted a younger age first homeless <25 years (AOR: 1.56; 95%CI= 1.06-2.27), a longer lifetime duration of homelessness (more than 3 years) (AOR: 1.41; 95%CI= 1.01-2.0), Post-Traumatic Stress Disorder (PTSD) (AOR: 1.91; 95%CI= 1.35-2.70), not meeting criteria for "severe" mental disorder (AOR: 1.72; 95%CI= 1.16-2.56), more severe substance use in the past month (AOR: 2.43; 95%CI= 1.67-3.56) and infectious blood borne diseases (AOR: 1.59; 95%CI= 1.08-2.34).

DISCUSSION

Our findings suggest that the trajectories leading to homelessness among Indigenous and non-Indigenous people differ meaningfully from each other, and that they can both be understood as consequences of different government policies. Consistent with the legacy of colonization and cultural genocide, when compared to others, Indigenous participants experienced homelessness and first used substances at a younger age, spent more of their lives living homeless, were more frequently taken by ambulance to hospital, and were more likely to meet criteria for PTSD, severe substance use, and have an infectious disease. Conversely, non-Indigenous participants were more likely to meet criteria for schizophrenia or other severe mental illness, suggesting links to deinstitutionalization and the inadequate implementation of alternative community-based treatment. These differences require consideration in the development of culturally-appropriate housing and support services that are specific to the needs of Indigenous and non-Indigenous peoples. Programs for Indigenous people must prevent homelessness early in life, stemming the grossly disproportionate rates of removal of Indigenous children and youth into state administered foster care (20,21).

Within our sample of Indigenous people, we found that almost half of the participants met criteria for PTSD (49% compared to 26% among non-Indigenous), consistent with a significant body of literature documenting the historical and continuing trauma experienced by Indigenous people in Canada (22-24). Bombay and colleagues (2009), proposed that trauma can be transmitted across generations, based on findings that children of trauma survivors were more likely to have negative responses to stressors and more likely to develop PTSD or depression as a result (22,23). The overrepresentation of Indigenous children in the child welfare system and foster care continues to impact Indigenous families and contributes to homelessness (2,12). In Canada, Indigenous children and youth are 15 times more likely to be in government care than non-Indigenous children and youth (20). Cycles of child neglect have been attributed to the impact of intergenerational trauma exhibited in Indigenous communities in varying degrees resulting from the residual effects of experiences in residential schools, the 60's scoop and the child welfare system (20). Intergenerational trauma represents a complex subtype of PTSD that must be addressed in housing interventions for Indigenous people.

Indigenous homeless participants in our study were significantly more likely to have used drugs at a younger age (13 years) compared to non-Indigenous participants. Indigenous participants were also more likely to report severe substance use in the past month. These findings are consistent with research involving non-homeless samples and showing that Indigenous youth compared to non-Indigenous youth have a higher likelihood of experimenting with substances at a younger age and using substances persistently into adulthood (25,26). Early initiation into drug use poses a significant risk for adverse outcomes such as infectious disease and other morbidity or mortality. Youth who initiated injection drug use at an earlier age have been found to be more likely to become infected with HIV and Hepatitis C, demonstrating the need for targeted and early intervention for youth at risk of drug use (27). Observers have consistently reported that Indigenous youth

are at disproportionately high risk for problematic substance use. However, few studies have investigated the protective factors related to substance use trajectories for Indigenous youth (28). Mainstream substance use treatment models have demonstrated limited success for Indigenous people (29). This may be because the factors responsible for substance use, (as well as homelessness and trauma) are unique to the experience of Indigenous people, and require "treatments" that restore and rebuild Indigenous culture and rights. Approaches that create reconnection to community, culture and traditions have been shown to have a positive impact on substance use (29). Rawana & Ames reported that optimism, participation in recreational activities, and attendance at religious or spiritual services were found to be protective against alcohol misuse for Indigenous youth (28). Prevention and early intervention of problematic substance use among Indigenous youth is urgently required in on-reserve and urban settings. Culturally relevant curricula, increased access to psychosocial supports, youth sports and recreation and peer support models and trauma informed services are also required.

Indigenous homelessness is an urgent concern and perpetuates inter-generational suffering of individuals as well as their families and communities. In 2018, the Metro Vancouver homeless count reported that Indigenous people comprised 40% of the homeless but only 2.2% of the total population, with close to half of Indigenous homeless identified as unsheltered (46%) (30). Furthermore, Indigenous women accounted for 53% of the Indigenous homeless in Vancouver. Among youth who were under 25 years close to half (46%) identified as Indigenous (30). In the 2016 count, homelessness among youth had increased to the highest level recorded in the region with 397, or 24% of the overall homeless population, under the age of 25. Youth reported that they had been affected by the lack of youth services or cuts to youth programs from one or more levels of government (31). Street involved youth often fall between services tailored to children or adults, and this issue is further complicated for Indigenous youth in the child welfare system (19,32).

Developmental resources grounded in Indigenous cultural practices are required to prevent homelessness among youth who are transitioning from foster care settings and also to support youth who experienced trauma in foster care settings (19,32).

Indigenous participants in both sites were significantly more likely than non-Indigenous people to have a regular medical doctor and were also more likely to have been taken to the hospital by an ambulance in the past 6 months. This seemingly contradictory finding may indicate that medical care alone is insufficient to prevent acute emergencies caused by environmental, social, and historical harms. Moreover, emergency room visits may be for reasons other than those typically addressed in a primary care setting such as acute psychotic symptoms, overdose, acute trauma, and other serious health complications caused by long-term homelessness.

The use of ambulance services for those who are homeless and mentally ill is indicative of the lack of essential supports to sustain wellness. Consistent with research with non-homeless samples, we found that Indigenous participants were more likely than non-Indigenous people to report positive status for HIV, Hepatitis C or Hepatitis B Virus(33,34). Marshall and colleagues examined HIV prevalence among street-involved youth and found that Indigenous ethnicity was a correlate of HIV infection and that Hepatitis C co-infection was less common among Indigenous participants (33). Indigenous people also face disparities in HIV outcomes and treatment, as they are likely to be diagnosed and initiate treatment later than non-Indigenous patients. Indigenous people have been noted to suffer higher mortality even after receiving antiretroviral treatment, suggesting that social determinants may need to be addressed in order to realize the expected effectiveness of medical treatment (34). Interventions must consider the inter-generational context of Indigenous homelessness, and promote the health of children through investments in families and communities.

This analysis has strengths and limitations. Strengths of the study include a large sample size, structured diagnostic interviews, and self-report measures validated against administrative data sources (35). Limitations include the possibility that current mental illness or substance use symptoms may have compromised some participant responses. Although participants were asked if they were First Nations, Inuit, Métis and status vs. non-status the current study did not allow for analysis to elicit unique differences between these smaller groups. It is recommended that further research investigate the differences between First Nations, Métis and Inuit service needs as well as differences between those recognized as status and non-status under the Indian Act to elucidate the diversity of service needs within Indigenous groups. Finally, we relied on self-reported ethnicity and it is possible that Indigenous people may not have self-identified due to concerns related to stigma and discrimination.

Implications

Pathways leading to homelessness differ meaningfully between Indigenous and non-Indigenous adults who meet criteria for current homelessness and mental illness. Consistent with our hypotheses, Indigenous participants experienced homelessness at a younger age, were homeless longer, had greater substance-related problems, less formal education, more health emergencies, and higher rates of infectious disease than non-Indigenous participants. Indigenous participants were also significantly more likely to satisfy our study's "mental illness" criterion with PTSD, while non-Indigenous participants were more likely to meet criteria for Schizophrenia or Bipolar Disorder. Our findings are consistent with the view that solutions to Indigenous homelessness – both prevention and treatment – must involve practices that restore social and cultural power to Indigenous communities. By contrast, non-Indigenous participants showed strong indications for the appropriateness of housing and assertive community treatment, as promised by governments during the era of deinstitutionalization. Further research is needed to

replicate these findings in other regions and where the historical experiences of Indigenous peoples differ based on varying degrees of political and social autonomy and the preservation of cultural practices.

Table 1: Socio-demographic, mental health, substance use and service use characteristics for Vancouver and Winnipeg at Home Study Participants (N=1010)

Variable	Vancouver Site N (%) 497(49.2)	Winnipeg Site N (%) 513(50.8)	P-Value
Need Level			
High Need	297(59.8)	199(38.8)	**<.001**
Moderate Need	200(40.2)	314(61.2)	
Gender			
Male	359(72.8)	326(63.8)	**.002**
Female	134(27.2)	185(36.2)	
Age at Enrollment			
Youth	36(7.2)	64(12.5)	
25-44 Years	281(56.5)	277(54.0)	
44 Plus Years	180(36.2)	172(33.5)	
Ethnicity			
Indigenous	77(15.5)	362(70.6)	**<.001**
Caucasian	280(56.3)	112(21.8)	
Mixed/Other	140(28.2)	39(7.6)	
Education			
High School or Higher	214(43.3)	157(30.7)	**<.001**
Less than High School	280(56.7)	354(69.3)	
Marital Status			
Single (never married)	343(69.6)	359(70.3)	.971
Married/Partner	25(5.1)	25(4.9)	
Separated/Widow/divorced	125(25.4)	127(24.9)	
Have Children (under 18)	122(25.1)	238(47.1)	**<.001**
Hospitalized for mental illness over 6 months in past 5 years	57(11.7)	23(4.5)	**<.001**
Hospitalized for mental illness over 2 times in the past 5 years	253(52.7)	111(21.9)	**<.001**
Arrested/Imprisoned/Probation/ Community sanction in past 6 months	221(45.2)	179(35.0)	**.001**
Spend 1 or more night in hospital, detox, shelter and jail in past 6 months	65(84.4)	321(88.7)	.298
Length of Homelessness Lifetime			
1-3 years	257(52.3)	262(53.0)	.827
3 years plus	234(47.7)	232(47.0)	
Length of homelessness longest single period			
12 months	246(50.1)	227(46.9)	.317
13-60 months	182(37.1)	192(39.7)	
60 months plus	63(12.8)	65(13.4)	
Age first homeless			
18 years or less	110(22.4)	138(27.2)	.173
19-30 years	158(32.2)	151(29.8)	

31-40 years	94(19.1)	106(20.9)	
Over 40 years	129(26.3)	112(22.1)	
Housing Status			
Absolutely Homeless	388(78.1)	354(69.1)	**.001**
Precariously Housed	109(21.9)	158(30.9)	
Less severe mental illness	264(53.1)	436(85.0)	**<.001**
Multiple mental disorders (≥2)	240(48.3)	338(65.9)	**<.001**
PTSD	129(26.0)	233(45.4)	**<.001**
Current suicidality (high)	373(75.1)	447(87.1)	**<.001**
Blood borne diseases	157(31.9)	113(22.2)	**.001**
Two or more physical illness	402(80.9)	458(89.3)	**<.001**
Have a regular medical doctor	320(64.5)	337(65.7)	.695
Place you usually go when you are sick or need advice about your health	395(80.8)	430(84.1)	.161
Needed health care, but did not receive it in past 6 months	209(43.2)	278(55.0)	**<.001**
Alcohol dependence	29(37.7)	261(72.1)	**<.001**
Current Substance dependence	57(74.0)	183(50.6)	**<.001**
Age first alcohol use (categorized by median) (≥ 14; ≤13)	33(44.0)	140(39.9)	**.510**
	42(56.0)	211(60.1)	
Age first drug use (After ≥ 14; ≤13)	37(49.3)	160(47.1)	**.721**
	38(50.7)	180(52.9)	
GAIN Score – (0-3 less severe); (4-5 severe) substance use in past month	34(48.6)	214(62.8)	**.027**
	36(51.4)	127(37.2)	

Table 2: Socio-demographic, mental health, substance use and service use characteristics for Vancouver and Winnipeg at Home Study participants by Indigenous ethnicity (N=1010)

Variable	Indigenous N (%) 439(43.5%)	Non-Indigenous N (%) 571(56.5%)	P-Value
Need Level			
High Need	180(41.0)	316(55.3)	**<.001**
Moderate Need	259(59.0)	255(44.7)	
Gender			
Male	265(61.1)	420(73.7)	**<.001**
Female	169(38.9)	150(26.3)	
Age at Enrollment			
Youth	53(12.1)	47(8.2)	**.043**
25-44 Years	266(60.6)	292(51.1)	
44 Plus Years	120(27.3)	232(40.6)	
Education			
High School or Higher	110(25.2)	261(46.0)	**<.001**
Less than High School	327(74.8)	307(54.0)	
Marital Status			
Single (never married)	313(71.6)	389(68.6)	**.018**
Married/Partner	29(6.6)	21(3.7)	
Separated/Widow/divorced	95(21.7)	157(27.7)	
Have Children (under 18)	222(51.5)	138(24.6)	**<.001**
Hospitalized for mental illness over 6 months in past 5 years	22(5.1)	58(10.3)	**.003**
Hospitalized for mental illness over 2 times in the past 5 years	107(24.7)	257(46.5)	**<.001**
Arrested/Imprisoned/Probation/ community sanction in past 6 months	171(39.0)	229(40.7)	.585
Spent one or more nights in hospital, detox, shelter and jail in past 6 months	386(87.9)	510(89.6)	.393
Length of Homelessness Lifetime			
1-3 years	205(48.3)	314(56.0)	**.018**
3 years plus	219(51.7)	247(44.0)	
Length of homelessness longest single period			
12 months	189(45.2)	284(51.0)	.074
13-60 months	166(39.7)	208(37.3)	
60 months plus	63(15.1)	65(11.7)	
Age first homeless			
18 years or less	130(30.0)	118(20.9)	**<.001**
19-30 years	142(32.7)	167(29.6)	
31-40 years	86(19.8)	114(20.2)	
Over 40 years	76(17.5)	165(29.3)	
Housing Status			
Absolutely Homeless	309(70.4)	433(76.0)	**.046**
Precariously Housed	130(29.6)	137(24.0)	
Less severe mental illness	370(84.3)	330(57.8)	**<.001**

Multiple mental disorders (≥2)	290(66.1)	288(50.4)	**<.001**
PTSD	215(49.0)	147(25.8)	**<.001**
Current suicidality (high)	381(86.8)	439(76.9)	**<.001**
Blood borne diseases	122(28.1)	148(26.1)	.488
Two or more physical illness	389(88.6)	471(82.5)	**.007**
Have a regular medical doctor	299(68.1)	358(62.8)	.080
Place you usually go when you are sick or need advice about your health	373(85.4)	452(80.3)	**.036**
Needed health care, but did not receive it in past 6 months	224(51.7)	263(47.3)	.167
Alcohol dependence	290(66.1)	153(26.8)	**<.001**
Current Substance dependence	240(54.7)	289(50.6)	.201
Age first alcohol use (categorized by median) (≥ 14; ≤13)	173(40.6) 253(59.4)	301(55.4) 242(44.6)	**<.001**
Age first drug use (After ≥ 14; ≤13)	197(47.5) 218(52.5)	327(63.1) 191(36.9)	**<.001**
GAIN Score – (0-3 less severe); (4-5 severe) substance use in past month	248(60.3) 163(39.7)	405(75.4) 132(24.6)	**<.001**

Table 3: Logistic Regression analysis to estimate the association between Indigenous Ethnicity and homelessness, mental & physical illness and service utilization among Vancouver and Winnipeg 'At home' participants (N=1010)

Dependent variable	Unadjusted OR (95% CI)	P Value	Adjusted[2] OR (95% CI)	P Value
Homelessness				
Age first homeless (<25 years)	1.54 (1.19, 1.98)	.001*	1.56 (1.06, 2.27)	.023*
Lifetime duration of homelessness (More or less than 3 years)	1.36(1.05, 1.75)	.018*	1.41(1.01, 2.0)	.041*
Longest single episode of homelessness (1 year or more)	1.26(0.98, 1.63)	.074	1.10(0.79, 1.52)	.590
Mental Health				
PTSD	2.76(2.12, 3.60)	<.001*	1.91(1.35, 2.70)	<.001*
Multiple mental disorders (≥2)	1.91(1.48, 2.47)	<.001*	1.27(0.90, 1.78)	.169
Less severe mental disorder	3.92(2.89, 5.32)	<.001*	1.72(1.16, 2.56)	.008*
Severe mental disorder	0.46(0.35, 0.59)	<.001*	0.73(0.50, 1.07)	.104
Substance Use				
Current substance dependence	1.18(0.92, 1.51)	.201	1.31(0.92, 1.86)	.132
Age first alcohol use (After ≥ 14; ≤13)	1.82(1.41, 2.35)	<.001*	1.35(0.97, 1.87)	.077
Age first drug use (After ≥ 14; ≤13)	1.90(1.46, 2.46)	<.001*	1.68(1.20, 2.37)	.003*
GAIN Score – (0-3 less severe); (4-5 severe) substance use in past month	2.02(1.53, 2.67)	<.001*	2.43(1.67, 3.56)	<.001*
Chronic Diseases				
Infectious (Blood Borne) disease – HIV, HEP C, HBV	1.10(0.83, 1.46)	.489	1.59(1.08, 2.34)	.018*
Multiple comorbid conditions (2 or more)	1.65(1.15, 2.40)	.007*	1.02(0.64, 1.64)	.923
Three or more physical conditions	1.90(1.41, 2.60)	<.001*	1.28(0.87, 1.90)	.212
Service Use				
Have regular medical doctor	1.27(0.97, 1.65)	.080	1.49(1.05, 2.10)	.024*
Needed health care but didn't receive it in past 6 months	1.19(0.93, 1.54)	.167	0.79(0.57, 1.10)	.166
Taken to ER in P6M	1.21(0.94, 1.56)	.145	1.37(0.99, 1.92)	.062
Multiple ER visit (>1 visit)	0.89(0.68, 1.16)	.382	1.07(0.75, 1.51)	.719
Taken by ambulance to hospital P6M	1.29(1.0, 1.67)	.052	1.86(1.32, 2.61)	<.001*
Arrested P6M	0.89(0.68, 1.17)	.416	1.10(0.76, 1.60)	.604
Court Appearances P6M	0.95(0.73, 1.25)	.717	1.06(0.74, 1.52)	.761
Participated in justice service programs (eg. drug	1.30(0.86, 1.96)	.218	1.13(0.66, 1.94)	.652

[2] - Controlled for age (continuous), gender (male, female), need level (high, moderate), marital status (single, other), site (Vancouver, Winnipeg), education (high school or higher, less than high school) and have children (under 18).

treatment court, mental health court, Indigenous justice)				

*p≤0.05

*Controlled for age (continuous), gender (male, female), need level (high, moderate), marital status (single, other), site (Vancouver, Winnipeg), education (high school or higher, less than high school), have children (under 18).

Contributorship Statement:
BB is the lead in the development of the manuscript. AM carried out the primary statistical analyses. MP, JD, JS and JO contributed to the editing of the manuscript. JS was the principal investigator, contributed to the research design and writing of the manuscript. All authors read and approved the final manuscript.

Competing Interests:
The authors declare that they have no competing interests.

Funding:
This work was supported by a grant to Simon Fraser University from Health Canada and the Mental Health Commission of Canada. The views expressed herein solely represent the authors.

Patient Consent: Obtained.

Ethics Approval: Office of Research Ethics, Simon Fraser University and the Health Research Ethics Board at the University of Manitoba.

Acknowledgments:
The research team would like to extend thanks to the participants, service providers and field research teams. The authors also thank the At Home/Chez Soi Project Collaborative.

Data Sharing:
Data is stored at St. Michael's Hospital in Toronto and is available to external investigators who sign a Data Sharing and Use Agreement that stipulates the responsibilities associated with transfer of datasets. Dr. Carol Adair at the University of Calgary is the data access coordinator.

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BMJ Open

Indigenous and Non-Indigenous People Experiencing Homelessness and Mental Illness in Two Canadian Cities: A Retrospective Analysis and Implications for Culturally Informed Action

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2018-024748.R1
Article Type:	Research
Date Submitted by the Author:	30-Jan-2019
Complete List of Authors:	Bingham, Brittany; Simon Fraser University, Health Sciences Moniruzzaman, Akm; Simon Fraser University, Patterson, Michelle; Simon Fraser University, Health Sciences Distasio, Jino; University of Winnipeg, Geography Sareen, J; University of Manitoba, Department of Community Health O'Neil, John; Simon Fraser University, Faculty of Health Sciences Somers, Julian; Simon Fraser University, Faculty of Health Sciences
Primary Subject Heading:	Health services research
Secondary Subject Heading:	Health policy, Health services research, Mental health, Addiction, Evidence based practice
Keywords:	Indigenous health, Homelessness, substance use, service use, health equity, MENTAL HEALTH

Indigenous and Non-Indigenous People Experiencing Homelessness and Mental Illness in Two Canadian Cities: A Retrospective Analysis and Implications for Culturally Informed Action

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Word Count Abstract: 281

Word Count Body: 4009

Key words: homelessness, Indigenous, mental health, substance use, service use

ABSTRACT

Objectives:

Indigenous people in Canada are not only overrepresented among the homeless population but their pathways to homelessness may differ from those of non-Indigenous people. This study investigated the history and current status of Indigenous and non-Indigenous people experiencing homelessness and mental illness. We hypothesized that compared to non-Indigenous people, those who are Indigenous would demonstrate histories of displacement earlier in life, higher rates of trauma and self-medication with alcohol and other substances.

Design and Setting: Retrospective data were collected from a sample recruited through referral from diverse social and health agencies in Winnipeg and Vancouver.

Participants: Eligibility included being 19 years or older, current mental disorder and homelessness.

Measures: Data was collected via interviews, using questionnaires, on socio-demographics (e.g., age, ethnicity, education), mental illness, substance use, physical health, service use and quality of life. Univariate and multivariable models were used to model the association between Indigenous ethnicity and dependent variables.

Results: A total of 1010 people met the inclusion criteria, of whom 439 self-identified as Indigenous. In adjusted models, Indigenous ethnicity was independently associated with being homeless at a younger age, having a lifetime duration of homelessness longer than 3 years, post-traumatic stress disorder, less severe mental disorder, more severe substance use in the past month and infectious disease. Indigenous participants were also nearly twice as likely as others (47% vs. 25%) to have children younger than 18 years.

Conclusions: Among Canadians who are homeless and mentally ill, those who are Indigenous have distinct histories and current needs that are consistent with the legacy of colonization. Responses to Indigenous homelessness must be developed within the context of reconciliation between Indigenous and non-Indigenous Canadians, addressing trauma, substance use, and family separations.

Trial Registration: This trial has been registered with the International Standard Randomized Control Trial Number Register and assigned ISRCTN42520374; ISRCTN57595077; ISRCTN66721740.

Strengths and Limitations of this Study:

- A large sample and validated self-report measures.
- First multi-site investigation of distinct needs among Indigenous homeless.
- Demonstration that Indigenous and non-Indigenous homeless individuals have needs that correspond to differences in their historical experiences.
- Symptoms of mental illness and substance use and recollection of past events may have influenced responses.
- Indigenous ethnicity may have been underreported due to concerns regarding stigma or discrimination.

BACKGROUND

Indigenous[1] people are overrepresented among homeless populations in every part of the world where these rates are documented (1). Indigenous people struggling with mental illness, substance use or homelessness often share experiences involving structural inequities and trauma related to colonization. Despite a visible presence of Indigenous peoples in the urban homeless populations of North America, Australia and New Zealand, there is limited research investigating the prevalence and causes of Indigenous homelessness (1). Indigenous Australians comprise 9% of the homeless population compared to 3.3% of the general population. Similarly, in New Zealand, Maori homelessness has been reported to be five times that of non-Maori (1). In Canada, homelessness among Indigenous peoples' is eight times more prevalent than among all others (2). Indigenous people comprise about 6% of British Columbia's population, yet in 2018 accounted for 40% of Vancouver's homeless of whom close to half are unsheltered (46%) (3). The Vancouver area is home to approximately 62,000 Indigenous people representing 23% of B.C.'s Indigenous population (4). Women accounted for 53% of the Indigenous homeless people in Vancouver, and 46% were under 25 (3). Homelessness among youth has increased in Vancouver, with those under 25 representing 24% of the overall homeless population [31].

Pathways to homelessness integrate poverty, mental illness, addiction, lack of affordable housing, and socio-economic inequities (5-7). The high prevalence of mental illness among the homeless (8,9) is related to sustained disinvestment in institutional models of care and insufficient attention to the design and implementation of community-based approaches to delivering housing and support (10). Fragmentation between systems responsible for health care and social services amplifies the challenges faced by people who

[1] The term 'Indigenous' will be used throughout this paper to collectively describe the Indigenous peoples of Canada, inclusive of those who identify as 'Aboriginal', or First Nations, Métis and Inuit. This term is used while also acknowledging the diversity of cultures, languages and traditions that exist among Indigenous Canadians.

are mentally ill and homeless (9). Many marginalized and homeless people must navigate a maze of multiple systems to receive essential supports, leading one scholar to describe them as "system survivors"(9). Multidisciplinary models integrating primary care and specialized services have been recommended for people with multiple and complex needs (11).

Indigenous pathways to homelessness are likely inclusive of the above factors. In addition, current inequities in the health of Indigenous peoples are directly related to past and present colonial policies that created and sustain systemic racism, cultural oppression, disempowerment and dispossession of Indigenous peoples' lands (2,5,12). The Indian Act (1876) and related policies served to dispossess Indigenous peoples of land, disrupt the practice and transmission of traditional knowledge, undermine the matriarchal role of women, and remove generations of children from their communities into settings where abuse was widespread. Canada's Truth and Reconciliation Commission (TRC) identified the residential school era as the beginning of intergenerational cycles of trauma for Indigenous Canadians (13,14), and concluded that the actions taken under the Indian Act and related policies amounted to "cultural genocide"(13).

Child welfare policies continue to separate Indigenous children from their families and communities. Indigenous youth are vastly over-represented in the child welfare system and foster care, disrupting Indigenous families and contributing to homelessness (2). In Canada, Indigenous children and youth are fifteen times more likely to be in government care than non-Indigenous children and youth (14). The "60's scoop" refers to a time at the height of the residential school era in the 50's and 60's, where an amendment to the Canadian Indian Act gave provinces authority over their child protection policies, leading to a dramatic increase in the number of Indigenous children in the child welfare system. Trauma arising from these experiences affects communities across generations (14).

These differences have led to the development of a distinct definition of Indigenous homelessness in Canada: "Unlike the common colonialist definition of homelessness, Indigenous homelessness is not defined as lacking a structure of habitation; rather, it is more fully described and understood through a composite lens of Indigenous worldviews. These include: individuals, families and communities isolated from their relationships to land, water, place, family, kin, each other, animals, cultures, languages and identities. Importantly, Indigenous people experiencing these kinds of homelessness cannot culturally, spiritually, emotionally or physically reconnect with their Indigeneity or lost relationships"(15). A related insight can be found in the final report of the TRC, which examined the urgent and complex relationships between Indigenous and non-Indigenous peoples in Canada and does not mention the term "homelessness" at all, but includes the term "home" 146 times, usually in the context of loss and enforced separation (13).

Among relevant empirical studies, disparities have been reported concerning Indigenous peoples' access to appropriate and responsive primary health care (16-18). Pervasive racism and discrimination against Indigenous peoples in the Canadian health care system has been widely reported and in many cases has led to Indigenous patients strategizing for how to avoid racism before seeking care or avoiding care altogether (16,19). Despite the high need for mental health, substance use and health care among homeless populations there remain substantial gaps in research examining the implications of historical and current differences between Indigenous and non-Indigenous peoples as they relate to policies and services addressing homelessness. The need for further research into the effects of ethnicity on homelessness has been well established (20). Indeed, few studies have examined the potential upstream causal factors that contribute to the overrepresentation of Indigenous people among the homeless (1). Such information is essential to the development of effective policies.

The current study investigated differences between Indigenous and non-Indigenous people who experienced homelessness and mental illness, and whether differences are consistent with distinct trajectories leading to homelessness. We hypothesized that Indigenous participants would be more likely to have experienced homelessness earlier in life and have higher prevalence of trauma and substance use, and that non-Indigenous participants would be more likely to experience serious mental illness such as schizophrenia.

METHODS

Ethics Statement

This study sample was recruited for the following experimental trials: ISRCTN42520374; ISRCTN57595077; ISRCTN66721740. All variables were collected pre-randomization. Ethical review and approval was conducted by the Research Ethics Boards at Simon Fraser University, the University of British Columbia and the University of Manitoba with endorsement from the University of Winnipeg.

Data Source and Sample

The At Home/Chez Soi study took place in five Canadian cities and enrolled participants who were homeless and mentally ill (21,22). The current study includes baseline data from Vancouver and Winnipeg, the sites with the highest proportions of Indigenous people who are homeless. Further details related to the trial protocols and methods that are not essential to the current study have been published elsewhere (21,22).

Eligibility criteria included being a legal adult (19 years or older), current mental disorder, and being absolutely or precariously housed. Absolute homelessness was defined as having no place to stay for more than seven nights and little likelihood of finding a place in the next month (21). Precarious housing referred to living in a rooming house, hotel or transitional housing, and having at least two episodes of homelessness, as defined above, in

the past year (21,22). Participants were recruited through referral from diverse agencies including: homeless shelters; drop in centers; homeless outreach teams; hospitals; community mental health team and criminal justice programs. Organizations that serve women, youth, Indigenous peoples and gay/lesbian/transgender were targeted to obtain a diverse sample.

An initial face-to-face interview was conducted to determine if referred individuals met the inclusion criteria. Upon meeting criteria, participants completed written informed consent obtained by the interviewer and were enrolled and administered the baseline questionnaire that included information on socio-demographics, mental illness, substance use, physical health, service use and quality of life. Participants were not eligible for recruitment if they could not give informed consent. Consent procedures were tested prior to study implementation (23) and interviewers were trained by senior clinicians with ongoing support from a clinical psychologist and psychiatry resident. Interviews were postponed or rescheduled if a participant was unable to give informed consent to the study details (e.g., randomization) for any reason [22]. Participants received a cash honorarium of $30 upon completion of the baseline interview and $20 for each subsequent interview. Results are based on data from the baseline questionnaires of 497 Vancouver participants and 513 Winnipeg participants.

Patient and Public Involvement

Indigenous people and community stakeholders were engaged in the development and implementation of this research. Community meetings (including advertised open meetings) and six focus groups were conducted with key informants [22]. In total, 58 individuals were convened and met with a facilitator who prepared reports of the proceedings. Focus group participants advised on procedures, reducing risks and maximizing benefits to participants and on how to incorporate the expertise of individuals

with direct experience of homelessness into the study. Narrative feedback from participants was incorporated into the grant application and the project. Service providers were also consulted extensively during the design of the research. More specifically, in Winnipeg, where Indigenous homelessness was a specific focus, an Indigenous research steering committee was created, comprised of elders and traditional teachers, to provide cultural advice and guidance to the research team to ensure that Indigenous perspectives were incorporated. In addition, a Lived Experience Circle (LEC) was created which honoured and promoted Indigenous lived experience through the research. In Winnipeg, persons with lived experience (PWLE) were involved in multiple roles on the project as representatives on an advisory committee and employed as research staff. PWLE assisted in facilitating integrated knowledge exchange, working with staff of the interventions and directly to bring patient perspectives into the research and interventions. Since completion of the trial, across all study sites findings have been reported at a variety of academic forums distributed to diverse audiences including provincial governments, municipalities, health authorities and community agencies. In April 2018, a forum was held where key members of community service organizations that work with Indigenous people who are homeless were invited to review study results, provide their recommendations and guide the interpretation of meaning. The current findings will be disseminated following publication via the established network of local service providers, stakeholders and participants of the research forum.

Variables of Interest

Indigenous or Aboriginal ethnicity status was derived from self-report. Participants were asked if they identify as "Aboriginal" and to check all that apply: Inuit, Métis, First Nations status, First Nations non-status, Indigenous from outside Canada and other. For the purposes of these analyses participants who identified as any of these categories of

"Aboriginal" were considered to be Indigenous. The cluster of severe mental disorders includes at least one of current (i.e. past month) Psychotic Disorder, mood disorder with psychotic features, and hypomanic or manic episode, as identified through the MINI International Neuropsychiatric Interview 6.0 (MINI)[24]. The MINI is a structured, short diagnostic interview often used for psychiatric evaluation and outcome tracking, with an administrative time of about 15 minutes. The less severe cluster includes at least one of current major depressive episode, panic disorder and posttraumatic stress disorder (PTSD). In addition, diagnosis of alcohol and substance dependence was assessed determined using the MINI. Substance use severity in the past month was assessed using the GAIN SPS (Global Assessment of Individual Need – Substance Problem Scale), a 16 item subscale that integrates research and clinical assessment for people presenting for substance abuse treatment [21]. Frequency of use included all illicit drugs and alcohol. Blood borne infectious disease was based on a positive self-report diagnosis of HIV, Hepatitis B, or Hepatitis C. Self-reported involvement with health services was collected for the past 6 months including visiting a: Family doctor, Psychiatrist, Emergency room (ER) and being transported by ambulance to an ER. Access to health care was elicited by the questions "Is there a place that you usually go to when you're sick or in need of advice about your health?" and "In the past 6 months, was there ever a time when you needed health care but you did not receive it?" Criminal justice services included: Contact with the police that did not result in arrest; contacts that resulted in arrest; or being held in a police cell for less than 24 hours. Rates of imprisonment were not differentiated from this item. However, further analysis of administrative records for the Vancouver sample found that 14% had been in custody during the six months prior to study recruitment [25]. Participants were categorized as either moderate needs (MN) or high needs (HN). Inclusion in the HN category was based on a score of 62 or lower on the Multnomah Community Ability Scale (MCAS) or current bipolar or psychotic disorder as well as one of the following: legal

involvement in the past year; substance dependence in the past month; and two or more hospitalizations for mental illness in the past 5 years [26]. All other eligible participants were categorized as MN in the study [22]. The MCAS is a 17-item scale measuring the degree of functional ability through 17 indicators. Indicators are rated into a 5-point scale across health, coping, social and behavioural domains. Detailed descriptions and psychometric information for study instruments is published in the At Home/Chez Soi Trial protocol [21].

Statistical Analysis

Pearson Chi-square or Fisher's exact test were used to conduct comparisons between baseline socio-demographic characteristics for Vancouver and Winnipeg participants and to make comparisons between Indigenous and non-Indigenous participants. Comparisons of numeric variables (e.g. age at enrolment) between groups were conducted using the Student t test and Wilcoxon's rank-sum test. Comparisons were conducted across socio-demographic variables, homelessness variables, mental health, substance use, health conditions and service use for individuals of Indigenous vs. non-Indigenous ethnicity. Univariate and multivariate logistic regression analyses were used to model the independent associations between Indigenous ethnicity and a series of outcome variables. Statistical significance (variables that were significant at the $p<0.05$ level) as well as subjective assessment were considered to select outcome variables for the multivariable logistic regression analyses. The multivariable model adjusted for potentially confounding variables which may have been unevenly distributed based on ethnicity [22,27]. The following controlling variables were used for the multivariable model: age (continuous); gender (man, woman); need level (high, moderate); marital status (single, other); site (Vancouver, Winnipeg); education (completed high school, incomplete high school); have

children (under age 18). Both unadjusted and adjusted odds ratios and 95% Confidence intervals (CI) are reported. SPSS Version 21 was used to conduct these analyses.

RESULTS

Descriptive characteristics of participants recruited in Vancouver (n=497) and Winnipeg (n=513) are presented in Table 1. In Vancouver, the mean age of participants was 41 years (SD=11) and the majority were male (73%), White (56%), single/never married (70%), and had not completed high school (57%). In Winnipeg, the mean age of participants (n=513) was 39 years (SD=11) and the majority were male (64%), Indigenous (71%), single/never married (70%), and had not completed high school (69%). Participants at the Vancouver and Winnipeg sites significantly differed with respect to: Need level; gender; ethnicity; education; hospitalizations; arrests; housing status; mental illness severity; and suicidality ($p \leq 0.05$).

Univariate comparisons between Indigenous (439) and non-Indigenous (571) samples from both study sites are presented in Table 2. The majority of Indigenous participants met criteria for the moderate needs condition (59%), were male (61%), had not completed high school (75%) and had a lifetime duration of homelessness greater than three years (52%). Compared to non-Indigenous participants, Indigenous participants were more likely to have children under the age of 18 (52% vs. 25%) and were first homeless at a younger age (63% vs. 51% reporting being first homeless before the age of 30).

Effect size estimates as unadjusted and adjusted odds ratios (UOR and AOR) and 95% confidence intervals (CI) are presented in Table 3. Results from multivariable logistic regression analyses indicate that self-reported Indigenous ethnicity independently predicted a younger age first homeless <25 years (AOR: 1.56; 95%CI= 1.06-2.27), a longer lifetime duration of homelessness (more than 3 years) (AOR: 1.41; 95%CI= 1.01-2.0), Post-Traumatic Stress Disorder (PTSD) (AOR: 1.91; 95%CI= 1.35-2.70), not meeting criteria for "severe" mental disorder (AOR: 1.72; 95%CI= 1.16-2.56), alcohol dependence (AOR: 2.64,

95% CI: 1.90, 3.68), more severe substance use in the past month (AOR: 2.43; 95%CI= 1.67-3.56) and infectious blood borne diseases (AOR: 1.59; 95%CI= 1.08-2.34).

DISCUSSION

Our findings suggest that the trajectories leading to homelessness among Indigenous and non-Indigenous people differ meaningfully from each other, and that they can be understood as consequences of harmful government policies. Consistent with the legacy of colonization and cultural genocide, when compared to others, Indigenous participants experienced homelessness and first used substances at a younger age, spent more of their lives living homeless, were more frequently taken by ambulance to hospital, and were more likely to meet criteria for PTSD, severe substance use, and have an infectious disease. Conversely, non-Indigenous participants were more likely to meet criteria for schizophrenia or other severe mental illness, suggesting links to deinstitutionalization and the inadequate implementation of alternative community-based treatment. These differences require consideration in the development of culturally-appropriate housing and support services that are specific to the needs of Indigenous and non-Indigenous peoples. Programs for Indigenous people must prevent homelessness early in life, stemming the grossly disproportionate rates of removal of Indigenous children and youth into state administered foster care [14,28].

Within our sample of Indigenous people, we found that almost half of the participants met criteria for PTSD (49% compared to 26% among non-Indigenous), consistent with a significant body of literature documenting the historical and continuing trauma experienced by Indigenous people in Canada [29-31]. Bombay and colleagues (2009), proposed that trauma can be transmitted across generations, based on findings that children of trauma survivors were more likely to have negative responses to stressors and more likely to develop PTSD or depression as a result [29,30]. Intergenerational trauma

represents a complex subtype of PTSD that must be addressed in housing interventions for Indigenous people.

Indigenous homeless participants in our study were significantly more likely to have used drugs at a younger age (13 years) compared to non-Indigenous participants. Indigenous participants were also more likely to report severe substance use in the past month. These findings are consistent with research involving non-homeless samples and showing that Indigenous youth compared to non-Indigenous youth have a higher likelihood of experimenting with substances at a younger age and using substances persistently into adulthood [32,33]. Early initiation into drug use poses a significant risk for adverse outcomes such as infectious disease and other morbidity or mortality. Youth who initiated injection drug use at an earlier age have been found to be more likely to become infected with HIV and Hepatitis C, demonstrating the need for targeted and early intervention for youth at risk of drug use [34]. Observers have consistently reported that Indigenous youth are at disproportionately high risk for problematic substance use. However, few studies have investigated the protective factors related to substance use trajectories for Indigenous youth [35]. Mainstream substance use treatment models have demonstrated limited success for Indigenous people [36]. This may be because the factors responsible for substance use, (as well as homelessness and trauma) are unique to the experience of Indigenous people, and require "treatments" that restore and rebuild Indigenous culture and rights. Approaches that create reconnection to community, culture and traditions have been shown to have a positive impact on substance use [36]. Rawana & Ames reported that optimism, participation in recreational activities, and attendance at religious or spiritual services were found to be protective against alcohol misuse for Indigenous youth [35]. Prevention and early intervention of problematic substance use among Indigenous youth is urgently required in on-reserve and urban settings. Culturally relevant curricula, increased access to

psychosocial supports, youth recreation and peer support models and trauma informed services are also required.

In the 2016 in the Metro Vancouver homeless count, homeless youth had increased to the highest level recorded in the region with 397, or 24% of the overall homeless population, under the age of 25. Youth reported that they had been affected by the lack of youth services or cuts to youth programs from one or more levels of government [37]. Street involved youth often fall between services tailored to children or adults, and this issue is further complicated for Indigenous youth in the child welfare system who age out of many system supports upon adulthood [27,38]. Developmental resources grounded in Indigenous cultural practices are required to prevent homelessness among youth who are transitioning from foster care settings and also to support youth who experienced trauma in foster care settings [27,38].

Indigenous participants in both sites were significantly more likely than non-Indigenous people to have a regular medical doctor and were also more likely to have been taken to the hospital by an ambulance in the past 6 months. This seemingly contradictory finding may indicate that medical care alone is insufficient to prevent acute emergencies caused by environmental, social, and historical harms. Moreover, emergency room visits may be for reasons other than those typically addressed in a primary care setting such as acute psychotic symptoms, overdose, acute trauma, and other serious health complications caused by long-term homelessness. Further research is required to investigate the impact of stigma and discrimination on service utilization for Indigenous people who are homeless and the need for culturally safe services for this population.

The use of ambulance services for those who are homeless and mentally ill is indicative of the lack of essential supports to sustain wellness. Consistent with research with non-homeless samples, we found that Indigenous participants were more likely than non-Indigenous people to report positive status for HIV, Hepatitis C or Hepatitis B Virus

[39,40]. Marshall and colleagues examined HIV prevalence among street-involved youth and found that Indigenous ethnicity was a correlate of HIV infection and that Hepatitis C co-infection was less common among Indigenous participants [39]. Indigenous people also face disparities in HIV outcomes and treatment, as they are likely to be diagnosed and initiate treatment later than non-Indigenous patients. Indigenous people have been noted to suffer higher mortality even after receiving antiretroviral treatment, suggesting that social determinants may need to be addressed in order to realize the expected effectiveness of medical treatment [40]. Interventions must consider the inter-generational context of Indigenous homelessness, and promote the health of children through investments in families and communities.

This analysis has strengths and limitations. Strengths of the study include a large sample size, structured diagnostic interviews, and self-report measures validated against administrative data sources [25]. Limitations include the possibility that current mental illness or substance use symptoms may have compromised some participant responses. Although participants were asked if they were First Nations, Inuit, Métis and status vs. non-status the current study did not allow for analysis to elicit unique differences between these smaller and distinct groups. It is recommended that further research investigate the differences between First Nations, Métis and Inuit service needs as well as differences between those recognized as status and non-status under the Indian Act to elucidate the diversity of service needs within Indigenous groups. Finally, we relied on self-reported ethnicity and it is possible that Indigenous people may not have self-identified due to concerns related to stigma and discrimination.

Implications

Pathways leading to homelessness differ meaningfully between Indigenous and non-Indigenous adults who meet criteria for current homelessness and mental illness. Consistent with our hypotheses, Indigenous participants experienced homelessness at a

younger age, were homeless longer, had greater substance-related problems, less formal education, more health emergencies, and higher rates of infectious disease than non-Indigenous participants. Indigenous participants were also significantly more likely to satisfy our study's "mental illness" criterion with PTSD, while non-Indigenous participants were more likely to meet criteria for Schizophrenia or Bipolar Disorder. Our findings are consistent with the view that solutions to Indigenous homelessness – both prevention and treatment – must involve practices that restore social and cultural power to Indigenous communities. By contrast, non-Indigenous participants showed strong indications for the appropriateness of housing and assertive community treatment, as promised by governments during the era of deinstitutionalization. Further research is needed to replicate these findings in other regions and where the historical experiences of Indigenous peoples differ based on varying degrees of political and social autonomy and the preservation of cultural practices.

Table 1: Socio-demographic, mental health, substance use and service use characteristics for Vancouver and Winnipeg at Home Study Participants (N=1010)

Variable	Vancouver Site N (%) 497(49.2)	Winnipeg Site N (%) 513(50.8)	P-Value
Need Level			
High Need	297(59.8)	199(38.8)	**<.001**
Moderate Need	200(40.2)	314(61.2)	
Gender			
Male	359(72.8)	326(63.8)	**.002**
Female	134(27.2)	185(36.2)	
Age at Enrollment			
Youth	36(7.2)	64(12.5)	
25-44 Years	281(56.5)	277(54.0)	
44 Plus Years	180(36.2)	172(33.5)	
Ethnicity			
Indigenous	77(15.5)	362(70.6)	**<.001**
White	280(56.3)	112(21.8)	
Mixed/Other	140(28.2)	39(7.6)	
Education			
High School or Higher	214(43.3)	157(30.7)	**<.001**
Less than High School	280(56.7)	354(69.3)	
Marital Status			
Single (never married)	343(69.6)	359(70.3)	.971
Married/Partner	25(5.1)	25(4.9)	
Separated/Widow/divorced	125(25.4)	127(24.9)	
Have Children (under 18)	122(25.1)	238(47.1)	**<.001**
Hospitalized for mental illness over 6 months in past 5 years	57(11.7)	23(4.5)	**<.001**
Hospitalized for mental illness over 2 times in the past 5 years	253(52.7)	111(21.9)	**<.001**
Arrested/Imprisoned/Probation/ Community sanction in past 6 months	221(45.2)	179(35.0)	**.001**
Spend 1 or more night in hospital, detox, shelter and jail in past 6 months	65(84.4)	321(88.7)	.298
Length of Homelessness Lifetime			
1-3 years	257(52.3)	262(53.0)	.827
3 years plus	234(47.7)	232(47.0)	
Length of homelessness longest single period			
12 months	246(50.1)	227(46.9)	.317
13-60 months	182(37.1)	192(39.7)	
60 months plus	63(12.8)	65(13.4)	
Age first homeless			
18 years or less	110(22.4)	138(27.2)	.173
19-30 years	158(32.2)	151(29.8)	

31-40 years	94(19.1)	106(20.9)	
Over 40 years	129(26.3)	112(22.1)	
Housing Status			
Absolutely Homeless	388(78.1)	354(69.1)	**.001**
Precariously Housed	109(21.9)	158(30.9)	
Mental Illness			
Less severe mental illness	264(53.1)	436(85.0)	**<.001**
Multiple mental disorders (≥2)	240(48.3)	338(65.9)	**<.001**
PTSD	129(26.0)	233(45.4)	**<.001**
Current suicidality (high)	373(75.1)	447(87.1)	**<.001**
Chronic Disease and Service Access			
Blood borne diseases	157(31.9)	113(22.2)	**.001**
Two or more physical illness	402(80.9)	458(89.3)	**<.001**
Have a regular medical doctor	320(64.5)	337(65.7)	.695
Place you usually go when you are sick or need advice about your health	395(80.8)	430(84.1)	.161
Needed health care, but did not receive it in past 6 months	209(43.2)	278(55.0)	**<.001**
Substance Use			
Current alcohol dependence	29(37.7)	261(72.1)	**<.001**
Current Substance dependence	57(74.0)	183(50.6)	**<.001**
Age first alcohol use (categorized by median) (≥ 14; ≤13)	33(44.0)	140(39.9)	**.510**
	42(56.0)	211(60.1)	
Age first drug use (After ≥ 14; ≤13)	37(49.3)	160(47.1)	**.721**
	38(50.7)	180(52.9)	
GAIN Score – (0-3 less severe); (4-5 severe) substance use in past month	34(48.6)	214(62.8)	**.027**
	36(51.4)	127(37.2)	

Table 2: Socio-demographic, mental health, substance use and service use characteristics for Vancouver and Winnipeg at Home Study participants by Indigenous ethnicity (N=1010)

Variable	Indigenous N (%) 439(43.5%)	Non-Indigenous N (%) 571(56.5%)	P-Value
Need Level			
High Need	180(41.0)	316(55.3)	**<.001**
Moderate Need	259(59.0)	255(44.7)	
Gender			
Male	265(61.1)	420(73.7)	**<.001**
Female	169(38.9)	150(26.3)	
Age at Enrollment			
Youth	53(12.1)	47(8.2)	**.043**
25-44 Years	266(60.6)	292(51.1)	
44 Plus Years	120(27.3)	232(40.6)	
Education			
High School or Higher	110(25.2)	261(46.0)	**<.001**
Less than High School	327(74.8)	307(54.0)	
Marital Status			
Single (never married)	313(71.6)	389(68.6)	**.018**
Married/Partner	29(6.6)	21(3.7)	
Separated/Widow/divorced	95(21.7)	157(27.7)	
Have Children (under 18)	222(51.5)	138(24.6)	**<.001**
Hospitalized for mental illness over 6 months in past 5 years	22(5.1)	58(10.3)	**.003**
Hospitalized for mental illness over 2 times in the past 5 years	107(24.7)	257(46.5)	**<.001**
Arrested/Imprisoned/Probation/ community sanction in past 6 months	171(39.0)	229(40.7)	.585
Spent one or more nights in hospital, detox, shelter and jail in past 6 months	386(87.9)	510(89.6)	.393
Length of Homelessness Lifetime			
1-3 years	205(48.3)	314(56.0)	**.018**
3 years plus	219(51.7)	247(44.0)	
Length of homelessness longest single period			
12 months	189(45.2)	284(51.0)	.074
13-60 months	166(39.7)	208(37.3)	
60 months plus	63(15.1)	65(11.7)	
Age first homeless			
18 years or less	130(30.0)	118(20.9)	**<.001**
19-30 years	142(32.7)	167(29.6)	
31-40 years	86(19.8)	114(20.2)	
Over 40 years	76(17.5)	165(29.3)	
Housing Status			
Absolutely Homeless	309(70.4)	433(76.0)	**.046**
Precariously Housed	130(29.6)	137(24.0)	
Mental Illness			

Less severe mental illness	370(84.3)	330(57.8)	**<.001**
Multiple mental disorders (≥2)	290(66.1)	288(50.4)	**<.001**
PTSD	215(49.0)	147(25.8)	**<.001**
Current suicidality (high)	381(86.8)	439(76.9)	**<.001**
Chronic Disease and Service Access			
Blood borne diseases	122(28.1)	148(26.1)	.488
Two or more physical illness	389(88.6)	471(82.5)	**.007**
Have a regular medical doctor	299(68.1)	358(62.8)	.080
Place you usually go when you are sick or need advice about your health	373(85.4)	452(80.3)	**.036**
Needed health care, but did not receive it in past 6 months	224(51.7)	263(47.3)	.167
Substance Use			
Current alcohol dependence	290(66.1)	153(26.8)	**<.001**
Current Substance dependence	240(54.7)	289(50.6)	.201
Age first alcohol use (categorized by median) (≥ 14; ≤13)	173(40.6)	301(55.4)	**<.001**
	253(59.4)	242(44.6)	
Age first drug use (After ≥ 14; ≤13)	197(47.5)	327(63.1)	**<.001**
	218(52.5)	191(36.9)	
GAIN Score – (0-3 less severe); (4-5 severe) substance use in past month	248(60.3)	405(75.4)	**<.001**
	163(39.7)	132(24.6)	

Table 3: Logistic Regression analysis to estimate the association between Indigenous Ethnicity and homelessness, mental & physical illness and service utilization among Vancouver and Winnipeg 'At home' participants (N=1010)

Dependent variable	Unadjusted OR (95% CI)	P Value	Adjusted[2] OR (95% CI)	P Value
Homelessness				
Age first homeless (<25 years)	1.54 (1.19, 1.98)	.001*	1.56 (1.06, 2.27)	.023*
Lifetime duration of homelessness (More or less than 3 years)	1.36 (1.05, 1.75)	.018*	1.41 (1.01, 2.0)	.041*
Longest single episode of homelessness (1 year or more)	1.26 (0.98, 1.63)	.074	1.10 (0.79, 1.52)	.590
Mental Illness				
PTSD	2.76 (2.12, 3.60)	<.001*	1.91 (1.35, 2.70)	<.001*
Multiple mental disorders (≥2)	1.91 (1.48, 2.47)	<.001*	1.27 (0.90, 1.78)	.169
Less severe mental disorder	3.92 (2.89, 5.32)	<.001*	1.72 (1.16, 2.56)	.008*
Severe mental disorder	0.46 (0.35, 0.59)	<.001*	0.73 (0.50, 1.07)	.104
Substance Use				
Current alcohol dependence	5.32 (4.06, 6.97)	<.001*	2.64 (1.90, 3.68)	
Current substance dependence	1.18 (0.92, 1.51)	.201	1.31 (0.92, 1.86)	.132
Age first alcohol use (After ≥ 14; ≤13)	1.82 (1.41, 2.35)	<.001*	1.35 (0.97, 1.87)	.077
Age first drug use (After ≥ 14; ≤13)	1.90 (1.46, 2.46)	<.001*	1.68 (1.20, 2.37)	.003*
GAIN Score – (0-3 less severe); (4-5 severe) substance use in past month	2.02 (1.53, 2.67)	<.001*	2.43 (1.67, 3.56)	<.001*
Chronic Disease				
Infectious (Blood Borne) disease – HIV, HEP C, HBV	1.10 (0.83, 1.46)	.489	1.59 (1.08, 2.34)	.018*
Multiple comorbid conditions (2 or more)	1.65 (1.15, 2.40)	.007*	1.02 (0.64, 1.64)	.923
Three or more physical conditions	1.90 (1.41, 2.60)	<.001*	1.28 (0.87, 1.90)	.212
Service Use				
Have regular medical doctor	1.27 (0.97, 1.65)	.080	1.49 (1.05, 2.10)	.024*
Needed health care but didn't receive it in past 6 months	1.19 (0.93, 1.54)	.167	0.79 (0.57, 1.10)	.166
Taken to ER in P6M	1.21 (0.94, 1.56)	.145	1.37 (0.99, 1.92)	.062
Multiple ER visit (>1 visit)	0.89 (0.68, 1.16)	.382	1.07 (0.75, 1.51)	.719
Taken by ambulance to hospital P6M	1.29 (1.0, 1.67)	.052	1.86 (1.32, 2.61)	<.001*
Arrested P6M	0.89 (0.68, 1.17)	.416	1.10 (0.76, 1.60)	.604
Court Appearances P6M	0.95 (0.73, 1.25)	.717	1.06 (0.74, 1.52)	.761

[2] - Controlled for age (continuous), gender (male, female), need level (high, moderate), marital status (single, other), site (Vancouver, Winnipeg), education (high school or higher, less than high school) and have children (under 18).

Participated in justice service programs (eg. drug treatment court, mental health court, Indigenous justice)	1.30 (0.86, 1.96)	.218	1.13 (0.66, 1.94)	.652

*p≤0.05

*Controlled for age (continuous), gender (male, female), need level (high, moderate), marital status (single, other), site (Vancouver, Winnipeg), education (high school or higher, less than high school), have children (under 18).

Contributorship Statement:
BB is the lead in the development of the manuscript. AM carried out the primary statistical analyses. MP, JD, JS and JO contributed to the editing of the manuscript. JS was the principal investigator, contributed to the research design and writing of the manuscript. All authors read and approved the final manuscript.

Competing Interests:
The authors declare that they have no competing interests.

Funding:
This work was supported by a grant to Simon Fraser University from Health Canada and the Mental Health Commission of Canada. The views expressed herein solely represent the authors.

Patient Consent: Obtained.

Ethics Approval: Office of Research Ethics, Simon Fraser University and the Health Research Ethics Board at the University of Manitoba.

Acknowledgments:
The research team would like to extend thanks to the participants, service providers and field research teams. The authors also thank the At Home/Chez Soi Project Collaborative.

Data Sharing:
Data is stored at St. Michael's Hospital in Toronto and is available to external investigators who sign a Data Sharing and Use Agreement that stipulates the responsibilities associated with transfer of datasets. Dr. Carol Adair at the University of Calgary is the data access coordinator.

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