

Mental health and substance use in an urban First Nations population in Hamilton, Ontario

Michelle Firestone, PhD,¹ Janet Smylie, MD,^{1,2} Sylvia Maracle, Hon. LL.D.,³ Constance McKnight, CAE,⁴ Michael Spiller, PhD,^{4,5} Patricia O'Campo, PhD⁶

ABSTRACT

OBJECTIVES: Mental health and substance use have been identified as health priorities currently facing Indigenous peoples in Canada; however, accessible and culturally relevant population health data for this group are almost non-existent. The aim of the Our Health Counts study was to generate First Nations adult population health data in partnership with the De dwa da dehs ney->s Aboriginal Health Access Centre in Hamilton, Ontario.

METHODS: Analysis involved data gathered through respondent-driven sampling. Prevalence estimates and 95% confidence intervals were generated for diagnosis and treatment of a psychological disorder or mental illness, depression, anxiety, post-traumatic stress disorder (PTSD) and suicide, alcohol and substance use, and access to emotional support.

RESULTS: Of the 554 First Nations adults who participated in the Our Health Counts study in Hamilton, 42% had been told by a health care worker that they had a psychological and/or mental health disorder. High rates of depression (39%) and PTSD (34%), as well as suicide ideation (41%) and attempts (51%) were reported. Half of the sample reported marijuana use in the previous 12 months, and 19% reported the use of cocaine and opiates.

CONCLUSION: First Nations adults living in Hamilton experience a disproportionate burden of mental health and addictions. By working in partnership with urban Aboriginal organizations, it is possible to produce policy- and service-relevant data and address the current deficiency in appropriate mental health and substance use services for urban Aboriginal people.

KEY WORDS: Canada; urban Aboriginal health; First Nations; community-based research; respondent driven sampling; mental health; substance use

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In Canada, cycles of family disruption, abuse, colonization, dislocation from traditional lands and outlawing of spiritual practices among Aboriginal* peoples have led to many health and social inequities.^{1,2} Rates of suicide, depression and substance abuse are significantly higher in many Aboriginal communities than in the general population.^{2–4} Aboriginal communities and their governing organizations have identified mental health and substance use as health priorities currently facing Aboriginal peoples in Canada. Currently, however, accessible and culturally relevant population health data for urban Aboriginal populations are limited. This near absence of health assessment data is of concern, given the size and growth of the Aboriginal population in Canada and known health and social disparities.^{2,3,5,6} The aim of this study was to respond to urban First Nations health information gaps in order to generate population-based measures of key mental health and substance use conditions for First Nations people living in Hamilton.

Prevalence rates of specific psychiatric disorders, diagnosed using culturally validated measures among Aboriginal people, are limited. Existing prevalence data are generally unadjusted

and based on service utilization or clinic records, and this produces underestimates, as many Aboriginal people do not use mainstream services.^{7,8} In addition, there are cultural and historical differences across Indigenous populations as well as methodological challenges associated with measuring and diagnosing these illnesses.⁹

These gaps were partially addressed by the development of the First Nations and Inuit Regional Longitudinal Health Survey (RHS), a national, population-based sample administered and governed by the Aboriginal community, which has generated

Author Affiliations

1. Well Living House Action Research Centre for Indigenous Infant Child and Family Health and Wellbeing, Centre for Research on Inner City Health, Keenan Research Centre in the Li Ka Shing Knowledge Institute of St. Michael's Hospital, Toronto, ON
2. Dalla Lana School of Public Health, University of Toronto, Toronto, ON
3. Ontario Federation of Indigenous Friendship Centres (OFIFC), Toronto, ON
4. De dwa da dehs ney->s Aboriginal Health Access Centre, Hamilton, ON
5. Department of Sociology, Cornell University, Ithaca, NY, USA
6. Centre for Research on Inner City Health, Keenan Research Centre in the Li Ka Shing Knowledge Institute of St. Michael's Hospital, Toronto, ON

Correspondence: Michelle Firestone, PhD, Centre for Inner City Health, St. Michael's Hospital, 30 Bond Street, Toronto, ON M5B 1W8, Tel: ☎416-864-6060, ext. 77437, E-mail: firestonem@smh.ca

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Conflict of Interest: None to declare.

* "Aboriginal peoples" is a collective name for all the original peoples of Canada and their descendants. The *Constitution Act* of 1982 specifies that the Aboriginal Peoples in Canada consist of three groups: Indians, Inuit and Métis. Globally, no universal definition of Indigenous peoples has been accepted. Most definitions of "Indigenous" will include reference to the relationships of Indigenous peoples to a collective kin group and a current or historic landbase.

high-quality and culturally grounded evidence for on-reserve populations.¹⁰ Results from the 2002 RHS indicated that 30.1% of respondents had experienced a time when they felt sad, blue or depressed for two weeks or more in a row, 30.9% reported having suicidal thoughts over their lifetime, and 15.8% reported having attempted suicide at least once in their lifetime.¹¹ In comparison, the Canadian Community Health Survey (CCHS), although it does include off-reserve Aboriginal populations in Canada, has a higher response bias and is not administered by the community. Results from the 2000/2001 CCHS showed that 13.2% of the off-reserve Aboriginal population had experienced a major depressive episode in the previous year.¹² CCHS data from Hamilton revealed that 26% of residents reported being limited by a physical or mental health condition.¹³

Although there are variations across communities,^{14,15} rates of suicide among certain First Nations and Inuit communities in Canada are high.¹⁶ Again, these data must be interpreted with caution as there are two potentially significant sources of error that must be considered: first, that suicide deaths are often under-reported and classified as accidental deaths and, second, that accurate data on whether a person is “Native” or “Non-Native” as self-defined or defined by the census are difficult to collect.¹⁷ Elevated rates of suicide and self-harm in Aboriginal populations in Canada and globally have been linked to the damaging impacts of colonization, including deculturation, intergenerational trauma and the cumulative effects of racism, discrimination and the social, economic and political exclusion experienced by Aboriginal communities.^{14,18}

Related to the lack of available and representative data is a need for more community-centric research and data systems that build on the strengths and priorities of Aboriginal communities, as well as a need for core involvement of Aboriginal people in the planning and implementation of services and programs.¹⁹ The current mental illness service delivery model has strong psychiatric and biomedical traditions and focuses largely on individualized interventions as opposed to a more wholistic, Aboriginal model of wellness that involves the physical, emotional, spiritual and mental aspects of a person who is always in connection with his or her community, family and the natural environment.^{20,21}

Given the almost non-existent population-based data for urban Aboriginal people in Canada, the main objective of the Our Health Counts (OHC) project was to work in partnership with Aboriginal stakeholders to generate a culturally relevant, representative baseline set of health data for three urban Aboriginal communities in Ontario, Canada. Respondent driven sampling (RDS) was selected as the recruitment method for a number of reasons: it builds on the existing strength of social networks,²² and it allows for the generation of unbiased estimates of a population’s composition by adjusting for different probabilities of being sampled and by use of a structured recruitment frame and a dual incentive process.^{23,24} The results presented here pertain specifically to the urban adult First Nations population in Hamilton, where the organizational project lead was the Ontario Federation of Indian Friendship Centres (OFIFC) and the community partner was De dwa da dehs ney>s Aboriginal Health Access Centre (DAHAC).

METHODS

Community-based participatory research

This study upheld current ethical and scientific standards in indigenous health research.²⁵⁻²⁸ Data sharing and research agreements were established between the academic research team, OFIFC and DAHAC. In addition, a Governing Council, comprising representatives from the core urban Aboriginal provincial organizations, was established to oversee all stages of the research process. All members of the Hamilton study team were from the Aboriginal community, living in the general vicinity of the city of Hamilton. Community-based processes for the OHC project are more fully described elsewhere.^{29,30} Formal ethics approval was provided by the Research Ethics Board of St. Michael’s Hospital in Toronto.

Study site

The City of Hamilton is located in southern Ontario on what was traditionally Haudenosaunee (Iroquoian) territory and is near two First Nations reserves: Six Nations of the Grand River and Mississaugas of the New Credit. According to the census, in 2006 the total Aboriginal population in Hamilton was 13,735 people, accounting for 2.8% of the total population of the city.³¹ The OFIFC identified the city of Hamilton as a promising community site on the basis of its significant Aboriginal population and strong infrastructure of Aboriginal community services.

Recruitment

The RDS process was initiated through the purposive selection of individuals, also called “seeds”, to begin recruitment. Inclusion criteria for participation in the study were age of 18 years or older, residence within the geographic boundaries of the City of Hamilton and self-identity as First Nations. With the help of community partners nine seeds were chosen, and they agreed to participate. In order for seeds to reflect a diverse demographic perspective of First Nations people living in Hamilton, factors such as sex, age, family size and occupations were considered in their selection.

Study participants, including seeds, provided written informed consent and then completed a health assessment survey, after which they received three to five coded coupons to refer a member of their social network into the study. Following the holiday closure of DAHC, the number of distributed coupons per recruit was increased from three to five in order to increase the rate of recruitment. Participants received a monetary reimbursement for their time and participation, which consisted of \$20 for completion of the survey and an additional \$10 for every eligible person recruited into the study. Study recruitment and interviews took place in an Aboriginal community centre.

For sample size calculation, we assumed 95% confidence intervals (CI), survey item prevalence ranges from 10% to 75% and a design effect of 2.³² On the basis of this formula, the OHC study aimed to recruit 500 First Nations adults and 250 children. The data presented here are for the adult sample only.

Sources of data

Community concept mapping was implemented to develop a community-specific survey for First Nations in Hamilton.³³ Data were collected and compiled using SPSS Data Collection Author.³⁴

We implemented the Kessler Psychological Distress Scale K-10 in order to measure depression and anxiety symptoms among study participants.³⁵ The K-10 has been used extensively in population-based studies and is well established as a reliable and valid tool in diverse contexts,^{35–37} including American Indian communities.³⁸ Analyses of the sensitivity and specificity of the K-10 also support the use of this screening instrument to appropriately identify likely cases of anxiety and depression.^{35,37} As indicated by scholars in the field,³⁶ an individual's total score can be broken down into four categories: low range (10–15), moderate range (16–21), high range (22–29) and very high range (30–50). Those individuals who fall into the high and very high range would likely receive a diagnosis of anxiety and/or depression.

In consultation with Aboriginal community partners, we selected the Primary Care PTSD Screen (PC-PTSD), a screening measure for post-traumatic stress disorder (PTSD) that has been empirically validated.³⁹ The PC-PTSD screening tool was designed to detect PTSD diagnoses in primary care settings by capturing meaningful, empirically derived symptom clusters using a 4-item, plain language scale.³⁹ Specifically, First Nations adults were asked if they had ever had any experience that was so frightening, horrible or upsetting that, in the previous month, they had had nightmares or thought about it when they did not want to; had tried hard not to think about it or went out of their way to avoid situations that reminded them of it; had been constantly on guard, watchful or easily startled; or had felt numb or detached from others, activities, or their surroundings. The literature suggests that the results of the PC-PTSD should be considered positive if a respondent answers “yes” to any three items; screening and positive cases should then be assessed with a structured interview for PTSD.³⁹

Alcohol use and suicide measures administered for Our Health Counts were the same as those used in the both the Aboriginal Peoples Survey⁴⁰ and the RHS,⁴¹ and had therefore been previously validated with Aboriginal populations. Additional substance use questions were modified from the RHS. Specifically, self-reported rates of alcohol consumption and substance misuse in the previous 12 months were investigated, as well as lifetime injection drug use or needle sharing.

Statistical analysis

RDS methods are used to carry out two tasks: to sample a population and to generate population estimates using methods of statistical inference. Population-based estimates and CIs were calculated using the RDS-I enhanced data smoothing estimator in the custom RDSAT software (version 7.1).⁴² Where possible, data were stratified by sex (male and female) and age (18–34 years; 35–49 years; and 50+); statistically significant differences with non-overlapping CIs are reported. The RDS methodology anticipates that personal networks are not randomly distributed and therefore adjusts for small to moderate levels of network clustering (e.g., people having ties to others like them), in the form of post-sampling weights.³²

RESULTS

Socio-demographic characteristics

From November 2009 to April 2010, a total of 554 First Nations adults were recruited into the study. A description of recruitment dynamics, RDS processes and data on demographic and social characteristics of First Nations adults in Hamilton was published by Firestone et al.³⁰ Referral trees generated recruitment chains that were long enough to achieve “equilibrium”, the point at which the sample composition becomes stable.⁴³ The data captured people who were homeless, transient and had low-literacy skills, who are known to be under-represented in the census.^{30,44,45} Overall, a high response rate for survey questions was observed, including sensitive questions around trauma and suicide. Specifically, for the K-10 scale and the PC-PTSD screen, the response rates were 94% and 97%, and the Cronbach's alpha values were 0.834 and 0.846 respectively. Such high response rates can be attributed to the survey tool itself, which reflected the health priorities of the community³³ and which was administered in a safe and culturally secure context.

Mental health

Most First Nations adults had been told under the age of 35 that they had a psychological and/or mental health disorder and over half were at that time taking medication (Table 1). When participants were stratified by age, we found that individuals aged 35 to 49 years were significantly more likely to be taking medication than those 18 to 34 years of age (73%, CI 57.4, 82.8 vs. 32.7%, CI 19.8, 46.3).

Depression, anxiety, PTSD and suicide

Scores for the K-10 scale are presented in Table 2. Those individuals who fell into the high and very high range (39% of First Nations adults) would likely receive a diagnosis of anxiety and/or depression. When we stratified PTSD indicators by sex and age categories we did not observe any significant differences.

Suicide among close friends or family was highly prevalent, and 40% of First Nations adults in Hamilton had ever thought about committing suicide themselves (Table 2). Although sex and age differences were not statistically significant, there was a strong trend indicating that individuals between 18 and 34 years were more likely to have had these thoughts than participants under 18 years of age (52.8%, CI 41.4, 63.9 vs. 32.7%, CI 22.1, 41.9).

Alcohol and substance use

Adjusted self-reported rates of alcohol consumption and substance use in the previous 12 months are presented in Table 3. In addition to the drugs listed, we also asked participants about PCP (phencyclidine)/Angel Dust, acid/LSD/amphetamines, inhalants and Ritalin, but the numbers were too small to report.

As an indicator of high-risk behaviour associated with drug use, we asked participants about needle sharing.

DISCUSSION

The goal of this research was to work in partnership with Aboriginal communities to address the current deficiency in

Table 1. Self-rated mental health and characteristics of diagnosed psychological or mental health disorders among First Nations adults

| Characteristic | Male prevalence % (95% CI) | Female prevalence % (95% CI) | Total prevalence % (95% CI) |
|---|----------------------------|------------------------------|-----------------------------|
| Rating of mental health compared with others respondent knows: | | | |
| Excellent | 20.8 (13.8, 27.8) | 22.2 (14.3, 31.7) | 21.4 (16.1, 27) |
| Good | 45.1 (37.3, 53.7) | 39.0 (30.9, 50.7) | 42.9 (37.2, 49.9) |
| Fair/poor | 34.1 (25.6, 42.7) | 38.7 (27, 47.2) | 35.7 (28.7, 41.8) |
| Psychological disorder | 39.2 (30.1, 48.6) | 45.4 (35.6, 55.7) | 41.7 (35, 48.8) |
| Age of diagnosis, years | | | |
| <18 | 22.8 (9, 3.25) | 37.7 (25.6, 55.4) | 29.5 (19.5, 38.3) |
| 18–35 | 43.0 (30.2, 60.7) | 41.5 (25.5, 59.3) | 42.6 (32.8, 55.7) |
| >35 | 34.1 (20.3, 50.5) | 20.9 (9, 27.8) | 27.9 (17.7, 37.2) |
| Taking medication for psychological disorder | 58.2 (43.5, 70.4) | 50.4 (36.4, 66.2) | 55.1 (44.5, 64.9) |
| Receiving treatment | 17.8 (9.3, 28.8) | 21.9 (12.4, 28.8) | 21.9 (12.4, 28.8) |
| Psychological disorder has limited activity | 49.8 (33.3, 62.9) | 52.1 (38.5, 66.8) | 50.9 (40.2, 60.5) |
| Experienced discrimination because of an emotional or mental health problem | 7.9 (4.6, 13) | 16.1 (8.9, 23.5) | 11.3 (7.6, 15.7) |
| Discrimination prevented or delayed receiving health care for the problem | 48.6 (18.6, 70.3) | 36.7 (16.9, 62.2) | 41.8 (24.9, 60) |

CI = confidence interval.

Table 2. Depression and anxiety, post-traumatic stress disorder and suicide among First Nations adults

| Disorder | Male | Female | Total |
|---|-------------------|-------------------|-------------------|
| Psychological Distress Scale (K-10) | | | |
| Low | 30.7 (22, 38.6) | 31.0 (21.3, 40.5) | 30.7 (24, 36.8) |
| Moderate | 34.8 (26.5, 43.8) | 23.9 (17.1, 34.2) | 30.3 (25.2, 37.7) |
| High | 21.4 (13.9, 29) | 26.5 (17.4, 36.9) | 23.7 (17.8, 30) |
| Very High | 13.1 (8.2, 20.1) | 18.5 (9.4, 25.9) | 15.3 (10.1, 19.7) |
| Post-traumatic stress disorder | | | |
| Nightmares | 33.2 (24.9, 40.9) | 37.6 (27.5, 45.5) | 34.8 (28, 40.1) |
| Avoided trauma | 41.2 (32.1, 49.7) | 46.1 (34.8, 55.6) | 43.2 (36, 49.4) |
| Startled by trauma | 39.8 (30.7, 48) | 43.7 (32.9, 52.7) | 41.2 (34, 47.3) |
| Detached/numb from others or surroundings | 31.4 (23.6, 40.7) | 44.0 (32.7, 54.1) | 36.2 (29.3, 43.5) |
| “Yes” to three or more of the above | 33.0 (24.4, 41.6) | 35.9 (25.3, 45) | 34.0 (27.2, 40.1) |
| Suicide | | | |
| Close friend or family member committed suicide | 43.1 (33.3, 51.6) | 42.4 (30.1, 50.8) | 42.9 (34.9, 48.6) |
| Self-harm on purpose | 24.9 (16.6, 33) | 34.2 (23.8, 44) | 28.7 (22.1, 34.7) |
| Thought about suicide | 36.9 (29.1, 46) | 46.6 (36.3, 57.3) | 40.8 (34.5, 47.9) |
| Attempted suicide | 49.9 (33.2, 63.6) | 52.3 (36.9, 67.9) | 51.0 (39.9, 61.4) |

Table 3. Substance use and related harms among First Nations adults

| Characteristic | Male % (95% CI) | Female % (95% CI) | Total % (95% CI) |
|---|-------------------|-------------------|-------------------|
| 5 or more alcoholic drinks on one occasion in the previous 12 months: | | | |
| Never | 24.2 (16, 31.6) | 29.6 (21.7, 39.8) | 26.1 (20.2, 32.1) |
| Once per month | 16.6 (11.5, 23.9) | 20.8 (12.8, 27.8) | 18.5 (13.8, 23.5) |
| More than once per month | 16.6 (9.4, 23.6) | 11.3 (6.9, 19.4) | 14.4 (10.2, 20.1) |
| 2–3 times per month | 15.5 (10.3, 23) | 20.5 (11.7, 29.4) | 17.5 (12.8, 23.2) |
| Once per week | 7.8 (3.7, 11.2) | 5.5 (2.2, 10) | 6.9 (3.9, 9.6) |
| More than once per week | 19.4 (12.6, 27) | 12.3 (5.1, 18.8) | 16.6 (11.2, 21.7) |
| Use of drugs in the previous 12 months | | | |
| Marijuana | 57.0 (47.5, 65.7) | 40.9 (30.3, 49) | 50.4 (43, 56.9) |
| Cocaine | 19.1 (12.1, 25.2) | 19.6 (12.2, 28.8) | 19.2 (14, 24.7) |
| Opiate | 20.1 (13, 27.3) | 16.9 (10.6, 25.1) | 18.6 (13.7, 23.9) |
| Sedative | 10.6 (5.7, 16.8) | 8.5 (3.5, 15.1) | 9.8 (6.2, 14.4) |
| Ever used needle to inject drug | 21.0 (14.5, 28.3) | 11.6 (5, 19.4) | 17.2 (12.5, 22.7) |
| Shared needle with partner | n/a | | 33.4 (17.4, 49.3) |

CI = confidence interval.

health data for Canadian urban Aboriginal peoples by generating a representative sample of First Nations individuals living in an urban setting. Through the successful implementation of RDS, population estimates and 95% CIs were produced for mental health and substance use indicators. Our findings confirm existing community and stakeholder concerns, and highlight the elevated levels of emotional suffering experienced by this population.

Close to 40% of First Nations participants scored in the high or very high range of the K-10 scale and would most likely present symptoms of clinical anxiety and depression.³⁶ As a comparison, the results from the 2008/10 RHS among on-reserve and mostly non-urban First Nations indicated that 48.9% scored in the low range (0–5), 44.8% scored in the moderate range (6–19) and 6.3% scored in the high range (20 and higher).⁴¹ Australia’s National Aboriginal and Torres Strait Islander Health Survey found that

scores from a modified K6 showed convergent validity with self-reported mental illness and additional stressors, including racial discrimination, unemployment and separation from family.^{46,47} In Canada, a recent report highlights the experiences of racism among urban Indigenous populations, who likely have increased contact with non-Indigenous people with limited understanding of the historical and contemporary socio-economic and political context of the lives of Indigenous people.^{48,49} Clearly, there is a need for further exploration around the urban environment and related challenges regarding access to housing, a lack of food security and high levels of poverty and racism, together with their impact on health in urban Aboriginal populations.

Forced assimilation in Canada has had a serious impact on factors such as the identity and mental health of Aboriginal peoples, as well as on the dynamics and overall structure of communities, bands and nations.^{50,51} It must be recognized that the impacts of historic events and policies on mental health and well-being might have been different for First Nations, Métis and Inuit, the differences manifesting themselves also between communities living on and off-reserve. To date, in Canada, no systemic studies have been conducted in order to generate comparable population-based PTSD screening data or prevalence rates among Aboriginal people.⁵² Findings from a telephone survey of close to 3,000 Canadians in 2002 revealed an estimated prevalence rate of lifetime PTSD of 9.2%, with a rate of current (1-month) PTSD of 2.4%.⁵³ Because of variations in screening tools, sample size, time frame for symptom duration and other population characteristics, comparison of epidemiological PTSD data is complicated.⁵³ For First Nations individuals in Hamilton, we observed that over a third of the population had experienced past trauma in their lives that was affecting their everyday well-being. As presented elsewhere, PTSD may be linked to residential school attendance, abuse and family violence, family disruption by child protection services and transgenerational trauma related to these and other impacts of colonization.^{54,55} There is an urgent need for ongoing screening for PTSD as well as the development and piloting of new screening and assessment tools customized to Indigenous-specific historic and ongoing trauma.

Rates of participants having a close friend or family member who had committed or attempted suicide, had self-harmed on purpose and had expressed suicide ideation were high in the study. Among those who had thought about suicide, 51% had made an attempt. Comparably, for on-reserve First Nations, the results from the 2002 RHS indicated that 30.9% reported having had suicidal thoughts over their lifetime, and 15.8% reported having attempted suicide at least once in their lifetime.¹¹ Issues surrounding suicide have been identified as a top health problem for Aboriginal people living in cities, and they continue to be inadequately addressed.⁵⁶ We also know that the overwhelming majority of Aboriginal suicide victims suffer from mental health disorders, and yet there are few agencies that offer a continuum of mental health care designed specifically for delivery to urban Aboriginal populations. It is anticipated that the data gathered through this research will corroborate and attest to the need to sustain and enhance existing services and programs aimed at suicide prevention in urban Aboriginal settings.⁵⁷

There is growing recognition of the co-occurrence of substance use and mental health disorders in non-Aboriginal and Aboriginal populations. However, there is a large knowledge and service gap for the treatment of concurrent disorders in this context and an even greater dearth of evidence for Aboriginal populations. The findings presented here are preliminary and descriptive; however, drug use and associated high risk behaviours among First Nations individuals may reflect mechanisms by which people are managing their poverty, stress and mental health issues. More in-depth analysis in the future will help to build our understanding of these issues, including initiation into drug use, acquisition of different types of drugs, binge drug use, and risks and exposure to blood-borne and sexually transmitted infections.

It is important to recognize that in the face of emotional suffering, First Nations adults also reported good levels of self-rated health, felt in balance in the physical, mental, emotional and spiritual aspects of self, and exhibited a strong sense of cultural identity.²⁹ Resilience and concepts such as enculturation have been explored as protective factors against substance use, suicide ideation and suicide attempts, depressive symptoms and chronic PTSD in indigenous settings.^{15,58} Our findings speak to the importance of culture-based coping mechanisms and health services for Aboriginal people.

There were some limitations to this study. First, RDS cannot guarantee a random sample of network members, meaning that there was room for bias with the sampling methodology. Given multiple assumptions in the sampling process, RDS estimates are likely to exhibit error; however, there have been few robust evaluations of RDS to quantify this.⁵⁹ There is an active literature on estimation using RDS data,⁶⁰ and there is debate regarding the true design effects in RDS surveys.⁶¹ Existing multivariable regression analyses using RDS samples have not suitably addressed the co-relation between observations and the unequal sampling probabilities inherent in RDS, therefore we are reporting prevalence estimates for which methods are better established. While there may have been some limitations with self-reporting, particularly around experiences and behaviours that are stigmatizing or too painful to recall, all interviews were conducted by members of the community in a safe and neutral place, and interviewers provided continued assurance of confidentiality.

Our findings clearly indicate disproportionately high levels of anxiety and depression, experiences of trauma, self-harm, and suicide ideation and attempts in an urban First Nations population in Hamilton. Additionally, the results highlight problematic drug use and related high-risk behaviour, as well as challenges to linking individuals to appropriate and accessible support for these issues. As expressed by key Aboriginal stakeholders and community members in Hamilton at our final dissemination and gathering, these findings are not new or surprising for the First Nations community.⁵⁶ However, by generating population-based health information where little previously existed and strengthening community and organizational partnerships and capacity, communities can be even more effective in driving change in policy and programming that will address health inequities faced by their people. For example, the results have supplemented the Department of Housing and Homelessness Report on the

Evaluation and Recommendations of the Homelessness Partnering Strategy in Hamilton,⁶² and the research will support the development of RDS as a tool to effectively recruit a larger cohort for longitudinal research involving Aboriginal families in Ontario.

REFERENCES

1. Loppie Reading C, Wien F. *Health Inequalities and Social Determinants of Aboriginal Peoples' Health*. National Collaborating Centre for Aboriginal Health, Prince George, BC, 2009.
2. National Collaborating Centre for Aboriginal Health (NCCAHA). *An Overview of Aboriginal Health in Canada*. Prince George, BC: Author, 2013.
3. Health Canada. *A Statistical Profile on the Health of First Nations in Canada*. Ottawa, ON: Author, 2002.
4. Indian and Northern Affairs Canada. *Report of the Royal Commission on Aboriginal Peoples (RCAP)*. Ottawa: Author, 1996.
5. Statistics Canada. *Aboriginal Peoples in Canada in 2006: Inuit, Métis and First Nations, 2006 Census*. Ottawa: Ministry of Industry, 2008.
6. Garner R, Carrière G, Sanmartin C, Longitudinal Health and Administrative Data Research Team. *The Health of First Nations Living Off-Reserve, Inuit, and Métis Adults in Canada: The Impact of Socio-economic Status on Inequalities in Health*. Ottawa: Statistics Canada, Health Analysis Division, 2010. Report No: 82-622-X.
7. Kirmayer LJ, Brass GM, Tait CL. The mental health of aboriginal peoples: Transformations of identity and community. *Can J Psychiatry* 2000;45:607-16. PMID: 11056823.
8. Smylie J, Anderson I, Ratima M, Crengle S, Anderson M. Who is measuring and why? Indigenous health performance measurement systems in Canada, Australia, and New Zealand. *Lancet* 2006;367:2029-31. doi: 10.1016/S0140-6736(06)68893-4.
9. Kirmayer LJ, Tait CL, Simpson C. The mental health of aboriginal peoples in Canada: Transformations of identity and community. In: Kirmayer LJ, Valaskakis G (Eds.), *Healing Traditions: The Mental Health of Aboriginal Peoples in Canada*. Vancouver, BC: UBC Press, 2009, 3-35.
10. Dumont J. *First Nations Regional Longitudinal Health Survey (RHS): Cultural Framework*. Ottawa: The First Nations Information Governance Centre, 2005.
11. Assembly of First Nations. *First Nations Regional Longitudinal Health Survey (RHS) 2002/03: Results for Adult, Youth and Children Living in First Nations Communities*. Ottawa, ON, 2007.
12. Tjepkema M. *The Health of the Off-reserve Aboriginal Population*. Supplement to Health Reports, vol. 13. Statistics Canada, 2002.
13. Statistics Canada. *Canadian Community Health Survey*. Ottawa: Author, 2007.
14. Chandler MJ, Lalonde C. Cultural continuity as a hedge against suicide in Canada's First Nations. *Transcult Psychiatry* 1998;35(2):191-219. doi: 10.1177/136346159803500202.
15. Chandler MJ, Lalonde C. Cultural continuity as a moderator of suicide risk among Canada's First Nations. In: Kirmayer LJ, Valaskakis G (Eds.), *Healing Traditions: The Mental Health of Aboriginal Peoples in Canada*. Vancouver: UBC Press, 2009, 221-48.
16. Aboriginal Healing Foundation. *Suicide Among Aboriginal People in Canada*. Ottawa: Author, 2007.
17. Health Canada. *Unintentional and Intentional Injury Profile for Aboriginal People in Canada 1990-1999*. Ottawa: Minister of Public Works and Government Services Canada, 2001.
18. Fraser Health Authority. *Fraser Region Aboriginal Youth Suicide Prevention Collaborative: Suicide Prevention, Intervention and Postvention Initiative*, 2010.
19. Estey MA, Smylie J, Macaulay AC. *Aboriginal Knowledge Translation: Understanding and Respecting the Distinct Needs of Aboriginal Communities in Research*. Ottawa: Canadian Institutes of Health Research, 2009.
20. Vukic A, Rudderham S, Misener-Martin R. A community partnership to explore gaps in mental health services in First Nations communities in Nova Scotia. *Can J Public Health* 2009;100(6):432-35. PMID: 20209736.
21. Smye V, Mussell B. *Aboriginal Mental Health: What Works Best*. Vancouver: Mental Health Evaluation and Community Consultation Unit, UBC, 2001.
22. Abdul-Quader A, Heckathorn D, Sabin K, Saidel T. Implementation and analysis of respondent driven sampling: Lessons from the field. *J Urban Health* 2006;83(1):1-5. doi: 10.1007/s11524-006-9108-8.
23. Heckathorn D. Respondent-driven sampling II: Deriving valid population estimates from chain referral samples of hidden populations. *Soc Probl* 2002;49(1):11-34. doi: 10.1525/sp.2002.49.1.11.
24. Heckathorn D, Seeman S, Broadhead R, Hugues J. Extensions of respondent driven sampling: A new approach to the study of injection drug users aged 18-25. *AIDS Behav* 2002;6(1):55-67. doi: 10.1023/A:1014528612685.
25. Canadian Institutes of Health Research. *CIHR Guidelines for Health Research Involving Aboriginal People*. Ottawa: Author, 2007.
26. Ball J, Janyst P. Enacting research ethics partnerships with Indigenous communities and Canada: "Do it in a good way". *J Empir Res Hum Res Ethics* 2008;3(2):33-51. PMID: 19385744. doi: 10.1525/jer.2008.3.2.33.

27. First Nations Centre. *First Nations Conceptual Frameworks and Applied Models on Ethics, Privacy, and Consent in Health Research and Information*. Ottawa: National Aboriginal Health Organization, 2006.
28. Ontario Federation of Indian Friendship Centres. *USAI Utility Self-Voicing Access Inter-relationship Reserach Framework*, Toronto, ON, 2012.
29. Smylie J, Firestone M, Cochran L, Prince C, Maracle S, Morley M, et al. *Our Health Counts - Urban Aboriginal Health Database Research Project: Community Report*, Toronto, ON, 2011.
30. Firestone M, Smylie J, Maracle S, Spiller M, De dwa da dehs ney>s Aboriginal Health Access Centre, O'Campo P. Unmasking health determinants and health outcomes for urban First Nations using respondent driven sampling. *BMJ Open* 2014;4:e004978. doi: 10.1136/bmjopen-2014-004978.
31. Statistics Canada. *Hamilton, Ontario (Code3525005) (table)*. 2006 Community Profiles. 2006 Census. Ottawa: Author, 2007. Report No: Catalogue no. 92-591-XWE.
32. Salganik MJ. Variance estimation, design effects, and sample size calculations for respondent-driven sampling. *J Urban Health* 2006;83(6 Suppl):98-112. PMID: 16937083.
33. Firestone M, Smylie J, Maracle S, Siedule C, O'Campo P. Concept mapping: Application of a community-based methodology in three urban Aboriginal populations. *Am Indian Cult Res J* 2014;38(4):85-104. doi: 10.17953/aicr.38.4.571154up25876h72.
34. IBM® SPSS® Data Collection Author [computer program]. Version 6.0.1. Chicago, IL: SPSS Inc., 2000.
35. Kessler RC, Andrew G, Colpe LJ, Hiripi E, Mroczek DK, Normand SL, et al. Short screening scales to monitor population prevalences and trends in non-specific psychological distress. *Psychol Med* 2002;32:959-76. PMID: 12214795.
36. Andrews G, Slade T. Interpreting scores on the Kessler Psychological Distress Scale. *Aust N Z J Public Health* 2001;25(6):494-97. PMID: 11824981.
37. Slade T, Grove R, Burgess P. Kessler Psychological Distress Scale: Normative data from the 2007 Australian National Survey of Mental Health and Wellbeing. *Aust N Z J Psychiatry* 2011;45(4):308-16. PMID: 21332432. doi: 10.3109/00048674.2010.543653.
38. Mitchell C, Beals J. The utility of the Kessler Screening Scale for Psychological Distress (K6) in two American Indian communities. *Psychol Assess* 2011; 23(3):752-61. PMID: 21534694. doi: 10.1037/a0023288.
39. Prins A, Ouimette P, Kimerling R, Camerond RP, Hugelshofer DS, Shaw-Hegwer J. The primary care PTSD screen (PC-PTSD): Development and operating characteristics. *Prim Care Psychiatry* 2003;9(1):9-14. doi: 10.1185/135525703125002360.
40. Statistics Canada. *Aboriginal Peoples Survey 2006: Adults, Children and Youth*. Ottawa: Author, 2006.
41. The First Nations Information Governance Centre. *First Nations Regional Health Survey (RHS) Phase 2 (2008/10) National Report on the Adult, Youth and Children Living in First Nations Communities*. Ottawa: Author, 2012.
42. Respondent-Driven Sampling Analysis Tool (RDSAT) Version 7.1 [computer program]. Ithaca, NY: Cornell University, 2007.
43. Wejnert C. An empirical test of respondent-driven sampling: Point estimates, variance, degree measures, and out-of-equilibrium data. *Soc Methodol* 2009; 39(1):73-116. doi: 10.1111/j.1467-9531.2009.01216.x.
44. Anderson M, Smylie J. Performance measurement systems in Canada: How well do they perform in First Nations, Inuit and Métis contexts? *Pimatisiwin* 2009;7(1):99-115. PMID: 23450984.
45. Smylie J, Anderson M. Understanding the health of Indigenous peoples in Canada: Key methodologic and conceptual challenges. *Can Med Assoc J* 2006;175(6):602-5. doi: 10.1503/cmaj.060940.
46. Stok Y, Kaplan I, Szwarc J. Clinical use of the Kessler Psychological Distress Scales with culturally diverse groups. *Int J Methods in Psychiatric Res* 2014;23(2):161-83. PMID: 24733815. doi: 10.1002/mpr.1426.
47. Cunningham J, Paradies Y. Sociodemographic factors and psychological distress in Indigenous and non-Indigenous Australian adults aged 18-64 years: Analysis of national survey data. *BMC Public Health* 2012;12(95):1-15. PMID: 22296820. doi: 10.1186/1471-2458-12-95.
48. Environics Institute. *Urban Aboriginal Peoples Study Main Report*. Toronto: Author, 2010.
49. The First Nations Information Governance Centre. *First Nations Regional Health Survey (RHS) Phase 2 (2008/10) National Report on the Adult, Youth and Children Living in First Nations Communities*. Ottawa: Author, 2012.
50. Battiste M. Introduction: Unfolding the lessons of colonization. In: Battiste M (Ed.), *Reclaiming Indigenous Voice and Vision*. Vancouver: UBC Press, 2000, xvi-xxx.
51. Waldram JB, Herring AD, Young TK. *Aboriginal Health in Canada: Historical, Cultural and Epidemiological Perspectives*. Toronto: University of Toronto Press, 2009.
52. Bombay A, Matheson K, Anisman H. Intergenerational trauma: Convergence of multiple processes among First Nations peoples in Canada. *J Aborig Health* 2009;5(3):6-47.
53. Van Ameringen M, Mancini C, Patterson B, Boyle MH. Post-traumatic stress disorder in Canada. *CNS Neurosci Ther* 2008;14(3):171-81. PMID: 18801110. doi: 10.1111/j.1755-5949.2008.00049.x.

54. Menzies P. Intergenerational trauma from a mental health perspective. *Native Soc Work J* 2010;7:63-85.
55. Corrado RR, Cohen IM. *Mental Health Profiles for a Sample of British Columbia's Survivors of the Canadian Residential School System*. Ottawa: Aboriginal Health Foundation, 2003.
56. Ontario Federation of Indian Friendship Centres (OFIFC), Ontario Métis Aboriginal Association, Ontario Native Women's Association (ONWA). *Urban Aboriginal Task Force Final Report*. Toronto, ON, 2007.
57. Anishnawbe Health Toronto. About Anishnawbe Health Toronto. 2010. Available at: <http://www.aht.ca/about> (Accessed June 8, 2014).
58. Zahradnik M, Stewart SH, O'Connor RM, Stevens D, Ungar M, Wekerle C. Resilience moderates the relationship between exposure to violence and posttraumatic reexperiencing in mi'kmaq youth. *Int J Ment Health Addict* 2010;8(2):408-20. doi: 10.1007/s11469-009-9228-y.
59. White RG, Lansky A, Goel S, Wilson D, Hladik W, Hakim A, et al. Respondent driven sampling - where we are and where should we be going? *Sex Transm Dis* 2012;88(6):397-99. doi: 10.1136/sextrans-2012-050703.
60. Gile KJ, Handcock MS. Respondent-driven sampling: An assessment of current methodology. *Soc Methodol* 2010;40(1):285-327. doi: 10.1111/j.1467-9531.2010.01223.x.
61. Wejnert C, Pham H, Krishna N, Le B, DiNenno E. Estimating design effect and calculating sample size for respondent-driven sampling studies of injection drug users in the United States. *AIDS Behav* 2012;16(4):797-806. PMID: 22350828. doi: 10.1007/s10461-012-0147-8.
62. City of Hamilton. *Hamilton Homelessness Partnering Strategy Priority Development (2012-2014)*. Hamilton, ON, 2011.

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RÉSUMÉ

OBJECTIFS : La santé mentale et la consommation de substances sont considérées comme deux enjeux prioritaires pour la santé des peuples autochtones au Canada à l'heure actuelle; cependant, les données de santé

des populations accessibles et culturellement appropriées sur ce groupe sont presque inexistantes. L'objet de l'étude Our Health Counts était de produire des données de santé des populations sur les adultes des Premières Nations, en partenariat avec le Centre autochtone d'accès aux soins de santé De dwa da dehs ney>s de Hamilton (Ontario).

MÉTHODE : Nous avons analysé des données recueillies par échantillonnage en fonction des répondants. Des estimations de prévalence et des intervalles de confiance de 95 % ont été générés pour le diagnostic et le traitement d'un trouble psychologique ou d'une maladie mentale, la dépression, l'anxiété, l'état de stress post-traumatique (ESPT), le suicide, la consommation d'alcool et de substances et l'accès au soutien affectif.

RÉSULTATS : Des 554 adultes des Premières Nations ayant participé à l'étude Our Health Counts à Hamilton, 42 % avaient été informés par un travailleur de la santé qu'ils avaient un trouble psychologique et/ou de santé mentale. Des taux élevés de dépression (39 %) et d'ESPT (34 %), ainsi que d'idéation suicidaire (41 %) et de tentatives de suicide (51 %) ont été déclarés. La moitié de l'échantillon a dit avoir consommé de la marijuana au cours des 12 mois antérieurs, et 19 % ont dit avoir consommé de la cocaïne et des opiacés.

CONCLUSION : Les adultes des Premières Nations vivant à Hamilton portent un fardeau disproportionné de troubles mentaux et de toxicomanie. En travaillant en partenariat avec des organismes autochtones en milieu urbain, il est possible de produire des données utiles pour les politiques et les services et de répondre au manque actuel de services en santé mentale et en toxicomanie pour les Autochtones en milieu urbain.

MOTS CLÉS : Canada; santé autochtone en milieu urbain; Premières Nations; recherche communautaire; échantillonnage en fonction des répondants; santé mentale; consommation de substances