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A pilot behavioural and biological surveillance survey for HIV and other bloodborne infections among Aboriginal people in Regina, Saskatchewan

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Abstract

Background: Aboriginal people in Canada are disproportionately affected by HIV and other blood-borne infections. A-Track is a national public health surveillance system designed to monitor HIV and related infections, behaviours and socio-demographic factors among Aboriginal populations in Canada. The pilot survey for the A-Track surveillance system, the first of its kind in Canada, was conducted in Regina, Saskatchewan and implemented via a community and public health partnership.

Objective: To assess the prevalence of HIV, hepatitis C, syphilis and associated risk behaviours and socio-demographic factors among Aboriginal people in Regina, Saskatchewan. This focus of the pilot survey was to provide this surveillance information for public health action and to determine whether this type of public health surveillance activity could be conducted in an urban setting across Canada.

Methods: Survey participants were self-identified Aboriginal people (First Nations, Inuit or Métis) or those who claimed Aboriginal ancestry and between the ages of 16 and 60 years. These individuals were also asked to provide a blood sample for HIV, hepatitis C and syphilis antibody testing. Descriptive analyses were performed with sex-based comparisons.

Results: There were 1064 people who participated in the survey. Their average age was 33 years and 51% were male. The majority of participants (93%) lived in urban Regina at the time of the survey. Just over half (53.2%) of all participants had been removed from their families during childhood; 29.9% had lived in a residential or boarding school during childhood; and 57.7% had lived at some point in a correctional facility. Among the 1,045 participants who provided a blood sample of sufficient quantity for testing, 5.2% were HIV seropositive and 55.8% of these were aware of their HIV status. The lifetime exposure to hepatitis C was 41.6%, with significantly higher proportions of males than females testing positive for hepatitis C exposure. Syphilis seroprevalence was very low (<1%). Almost three-quarters (71.5%) of participants reported being tested for HIV at least once in their lifetime and among those ever tested, 67.6% had been tested during the 12 months prior to the interview.

Conclusion: Aboriginal people are disproportionately affected by the HIV/AIDS epidemic in Canada. The findings from the A-Track pilot survey can be used to inform and evaluate prevention and treatment services for HIV and other related infections among Aboriginal people. Lessons learned from the pilot survey could also be used to guide the possible implementation of A-Track in other urban and/or reserve locations in Canada.

Introduction

In Canada, Aboriginal people remain disproportionately affected by HIV/AIDS. It is estimated that in 2011, Aboriginal people made up 12.2% of new HIV infections (1). At the end of 2011, 8.9% of those living with HIV in Canada were Aboriginal people (1). By comparison, Aboriginal people represented 4.3% of the Canadian population in the 2011 census (2).

A-Track is a behavioural and biological surveillance system developed to monitor the prevalence of HIV and other related infections as well as associated risk behaviours and socio-demographics among Aboriginal populations in Canada. The A-Track system was piloted in Regina, Saskatchewan from 2011 to 2012. The focus of the pilot survey was to provide important surveillance information and determine whether this type of public health surveillance activity could be conducted in urban settings in Canada.

This report provides selected findings from the A-Track pilot survey and is a summary of a more in-depth report entitled *Summary of key finding from the A-Track pilot survey, 2011 - 2012* (3).

Methods

A-Track is a behavioural and biological surveillance system that monitors the prevalence of HIV and other related infections as well as the associated risk behaviours and socio-demographics among Aboriginal populations in Canada. A pilot survey was launched in Regina, Saskatchewan, from December 5, 2011 to June 15, 2012.

The A-Track pilot survey was developed and implemented via a community and public health partnership. The partners included: a Community Advisory Group, All Nations Hope Network, Regina Qu'Appelle Health Region, the Canadian Aboriginal AIDS Network, First Nations University of Canada and the Public Health Agency of Canada.

The A-Track surveillance system recognizes Aboriginal peoples' shared control over data, respects Aboriginal customs and is based on the tenants of mutual respect between all stakeholders, the recognition of shared responsibility, Aboriginal community involvement and the utilization of existing local expertise. The surveillance system protocol recognizes First Nations, Inuit and Métis communities-specific culturally competent ethical research practices including the principles of data ownership, control, access and possession and protection (4) and follows the *Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans* (5) and the Canadian Institutes of Health Research *Guidelines for Health Research Involving Aboriginal People* (6). The data from the Regina pilot survey is managed collaboratively by the All Nations Hope Network, the Regina Qu'Appelle Health Region and the Public Health Agency of Canada.

The target population for the pilot survey was people who self-identified as Aboriginal (First Nations, Inuit or Métis) or claimed Aboriginal ancestry and were between the ages of 16 and 60 years. Participation was voluntary, completely anonymous and based on informed verbal consent. Participants were recruited from community-based organizations, Friendship Centres, healthcare service points and other relevant venues in Regina.

Consenting participants were asked to complete a questionnaire covering demographics, sexual behaviour, drug use, HIV and hepatitis C testing / treatment history, access to health services and HIV-related knowledge. Participants were also asked to provide a finger prick blood sample which was tested for HIV, hepatitis C and syphilis antibodies.

The data in this report are descriptive results shown for the overall sample (as well as by sex) allowing for comparisons between male and female participants for demographics, antibody laboratory results, sexual and drug use behaviours and HIV testing, care and treatment. Findings for self-reported HIV, sexually transmitted infection and tuberculosis infection status, access to health services and HIV-related knowledge are not presented here and can be obtained from the full report (3). Where data in the table contain small cell counts, results should be interpreted with caution.

Results

A total of 1,064 individuals participated in the A-Track pilot survey, two of whom claimed Aboriginal ancestry and 1,062 of whom self-identified as Aboriginal. (**Table 1**) Of these 1,062, the majority (90.1%) self-identified as First Nations. Just over half (50.7%) of the participants were male and just under half (44.8%) of the participants were between the ages of 30 and 49 years, with a slightly lower proportion (42.2%) under the age of 29 years and over the age of 50 (13.0%). While the majority of participants (95.5%) self-reported their sexual orientation as heterosexual or straight, a significantly higher proportion of females than males self-identified as gay, lesbian, bisexual or other (6.9% versus 2.2%).

Table 1: Demographic characteristics of A-Track pilot survey participants

Demographic characteristic and past experiences	Total (n=1064)	Male (n=539)	Female (n=525)	p-value
Aboriginal subgroup (n=1062)				
First Nations	90.1% (957)	88.8% (477)	91.4% (480)	0.357
Métis	9.7% (103)	11.0% (59)	8.4% (44)	
Inuit	<1%	<1%	<1%	
Age in years (n=1064)				
29 and less	42.2% (449)	37.5% (202)	47.1% (247)	0.007
30 to 49	44.8% (477)	48.2% (260)	41.3% (217)	
50 and over	13.0% (138)	14.3% (77)	11.6% (61)	
Sexual orientation (n=1064)				
Gay, lesbian, bisexual and other	4.5% (48)	2.2% (12)	6.9% (36)	<0.001
Heterosexual or straight	95.5% (1016)	97.8% (527)	93.1% (489)	
Highest completed level of education (n=1064)				
Completed some high school or less	60.2% (640)	60.3% (325)	60.0% (315)	0.733
Completed high school	19.5% (208)	20.2% (109)	18.9% (99)	
Completed more than high school	20.2% (214)	19.3% (104)	21.0% (110)	
Total household income (n=738)[1]				
Up to $9,999	27.1% (200)	27.7% (100)	26.5% (100)	0.011
$10,000 to $39,999	51.1% (377)	46.3% (167)	55.7% (210)	
$40,000 or more	21.8% (161)	26.0% (94)	17.8% (67)	
Proportion who were ever removed or separated from family during childhood by child welfare agencies, church or government officials (n=1063)	53.2% (565)	53.0% (285)	53.3% (280)	0.907
Proportion who ever attended residential or boarding school for Aboriginal children during childhood (n=1061)	29.9% (317)	32.1% (172)	27.6% (145)	0.112
Proportion who were ever placed in a foster home or in foster care during childhood (n=1060)	43.4% (460)	41.7% (223)	45.1% (237)	0.256

Housing status during the 12 months prior to interview (n=1064) [2]				
Stable housing	73.5% (782)	68.8% (371)	78.3% (411)	
Unstable housing	6.4% (68)	8.2% (44)	4.6% (24)	0.001
Mix of stable and unstable housing	20.1% (214)	23.0% (124)	17.1% (90)	
Proportion who moved during the 12 months prior to interview for any reason (n=1064)	33.3% (354)	33.2% (179)	33.3% (175)	0.966
Proportion who had ever lived in a correctional facility (n=1061)	57.7% (612)	70.2% (376)	45.0% (236)	<0.001
Proportion who had lived in a correctional facility during the 12 months prior to interview (n=1064)	5.2% (55)	7.2% (39)	3.1% (16)	0.002

[1] Income was measured as the total household income, before taxes and other deductions, from all sources for the year ending December 31, 2010.
[2] Participants were asked to indicate all of the types of places where they had continuously or occasionally lived during the 12 months prior to interview. Responses were categorized as stable housing, unstable housing and mix of stable and unstable housing. Stable housing included: living in an apartment or house or a relative's apartment or house during the 12 months prior to interview. Unstable housing included: living in a friend's place, hotel or motel room, rooming or boarding house, shelter or hostel, transition or halfway house, drug treatment facility, correctional facility, public place (e.g., street, squats), psychiatric institution, hospital or any other responses that were considered unstable (e.g., vehicle, tent, anywhere outdoors) within the 12 months prior to interview.

Just over half (51.1%) of all participants who provided responses when asked about household income reported that their total household income was between $10,000 and $39,000. Significant differences were noted between the self-reported household incomes of males and females. Over half (60.2%) of the participants had less than a high school education, 19.5% had completed high school and 20.3% had some post-secondary education.

Just over half (53.2%) of all participants had been removed from their families during childhood; almost one-third (29.9%) had at some time during childhood lived in a residential or boarding school; and 43.4% had been placed in foster care at some time during childhood. No significant differences were noted between males and females.

While only 6.4% of all participants reported living exclusively in unstable housing during the 12 months prior to interview, 20.1% reported a mix of unstable and stable housing. A significantly higher proportion of male than female participants reported unstable housing as well as a mix of unstable and stable housing during the 12 months prior to interview. One-third of participants (33.3%) reported that they had moved for some reason within the 12 months prior to interview; no significant differences were noted between males and females.

Over half of all participants (57.7%) had, at some time in their lives, lived in a correctional facility; for male participants, this proportion was significantly higher as compared to female participants. The proportion of male participants who had lived in a correctional facility in the 12 months prior to interview was significantly higher than the proportion of female participants (7.2% versus 3.1%).

Table 2: HIV, hepatitis C and syphilis testing results for A-Track pilot survey participants

Laboratory results	Total	Male	Female	p-value
HIV seroprevalence (among participants who provided a blood sample, n=1045)[1]				
HIV seropositive	5.2% (54)	6.0% (32)	4.3% (22)	0.213
Proportion of HIV seropositive participants who reported a history of injection drug use (n=54)	92.6% (50)	90.6% (29)	95.5% (21)	0.506[5]
Proportion of HIV seropositive participants who were aware of their HIV positive status (n=52)[2]	55.8% (29)	50.0% (15)	63.6% (14)	0.328
Lifetime exposure to hepatitis C (among participants who provided a blood sample, n=1044)[3]				

Hepatitis C seropositive	41.6% (434)	46.1% (245)	36.9% (189)	0.003
HIV and hepatitis C serostatus (among participants who provided a blood sample of sufficient quantity for testing of both HIV and hepatitis C antibodies, n=1044)				
Seropositive for HIV only	0.0% (0)	0.0% (0)	0.0% (0)	0.011
Seropositive for hepatitis C only	36.5% (381)	40.2% (214)	32.6% (167)	
Seropositive for both HIV and hepatitis C	5.1% (53)	5.8% (31)	4.3% (22)	
Seronegative for both HIV and hepatitis C	58.4% (610)	54.0% (287)	63.1% (323)	
Lifetime exposure to syphilis (among participants who provided a blood sample, n=1045)[4]				
Syphilis seropositive	0.2% (2)	0.2% (1)	0.2% (1)	0.977[5]

[1] HIV testing of dried blood spot (DBS) specimens was performed using the AVIOQ HIV-1 EIA assay. Confirmatory testing was subsequently performed using the Bio-Rad GS HIV-1 Western Blot assay. A positive result indicated a current HIV infection.
[2] Participants who reported that their last HIV test result was positive and who were found to be HIV seropositive based on testing of the biological specimen provided at the time of interview were classified as being aware of their HIV positive status.
[3] Hepatitis C testing of DBS specimens was performed using the Ortho HCV version 3.0 EIA. Confirmatory testing was not performed for samples that tested positive. A positive result indicated past or present hepatitis C infection and did not discriminate acute from chronic or resolved infections.
[4] Syphilis testing was performed using the Serodia® Treponema pallidum particle agglutination assay (TP-PA). Confirmatory testing was not performed for samples that tested positive. A positive result was due either to false positivity or the presence of antibodies against syphilis, which indicated either past or present syphilis infection but did not distinguish acute from chronic or resolved infections.
[5] Please note that due to small cell counts, Chi-squared results should be interpreted with caution.

Among the 1,045 participants who provided a blood sample of sufficient quantity for HIV testing, 54 participants (5.2%) were found to be HIV positive and no significant differences were found between males and females **(Table 2)**. Of the 54 participants who tested positive for HIV, the majority of both males and females had a history of injection drug use; overall, 92.6% of all HIV seropositive participants reported that they had, at some time in their lives, used injection drugs. Just over half (55.8%) of the participants who were found to be HIV seropositive were aware of their HIV positive status and no significant differences were noted between males and females.

It is interesting to note that unawareness of HIV infection status was highest among participants who were HIV positive and who did not have a history of injection drug use. Among the 54 participants who tested positive for HIV, four had never injected and all of these participants (4/4; 100%) were unaware of their HIV positive status (data not shown). By contrast, among the 50 participants who tested positive for HIV and had a history of injection drug use, 42% (21/50) were unaware of their HIV positive status (data not shown).

Among the 1,044 participants who provided a sample of sufficient quantity for hepatitis C antibody testing, 41.6% were seropositive, with significantly higher proportions of males than females testing positive for hepatitis C exposure. A positive hepatitis C result indicates past or present hepatitis C infection and does not discriminate acute from chronic or resolved infections. Syphilis seroprevalence was very low among both males and females; overall, only 0.2% of participants were seropositive for syphilis. A positive syphilis result indicates past or present syphilis infection.

Although it is not possible to determine the proportion of participants that were co-infected with HIV and hepatitis C at the time of the survey due to the laboratory test used (i.e., it was not possible to distinguish present from past hepatitis C infection), 5.1% of participants were found to be seropositive for both HIV and hepatitis C. A significantly higher proportion of males than females tested positive for both HIV and hepatitis C antibodies.

Table 3: Injecting behaviours of the A-Track pilot survey participants

Injecting behaviour	Total	Male	Female	p-value
Proportion who had ever injected drugs (n=1063)	50.0% (532)	53.4% (287)	46.7% (245)	0.029
Proportion that were identified as HIV seropositive based on testing of biological sample among those who reported ever injecting drugs (n=528)	9.5% (50)	10.2% (29)	8.6% (21)	0.549

Proportion who first injected before the age of 16 (n=531)	19.4% (103)	19.5% (56)	19.3% (47)	0.942
Proportion who had injected drugs in the six months prior to interview (n=1064)	30.3% (322)	32.5% (175)	28.0% (147)	0.113
Injecting behaviours among participants who reported injecting drugs in the six months prior to interview (n=322)				
Proportion who used sterile needles and/or syringes at last injection (n=321)[1]	98.8% (317)	97.7% (170)	100% (147)	0.064
Proportion who injected with a used needle and/or syringe in the six months prior to interview (n=319)	9.1% (29)	8.7% (15)	9.6% (14)	0.776
Most commonly reported injection drugs used in the six months prior to interview[2]				
Cocaine	56.7% (181)	59.5% (103)	53.4% (78)	0.272
Non-prescribed morphine	51.1% (163)	54.9% (95)	46.6% (68)	0.138
Ritalin	49.8% (159)	49.1% (89)	50.7% (74)	0.782
Non-prescribed Talwin and Ritalin	17.2% (55)	16.2% (28)	18.5% (27)	0.587
Dilaudid (hydromorphone)	15.7% (50)	15.6% (27)	15.8% (23)	0.971
Most commonly reported person with whom participants injected in the six months prior to interview[2]				
Friend(s) or people you know well	53.3% (171)	55.2% (96)	51.0% (75)	0.458
Regular sex partner(s)	47.7% (153)	47.7% (83)	47.6% (70)	0.988
No one: you injected by yourself	40.2% (129)	42.0% (73)	38.1% (56)	0.482
Most commonly reported location of injection in the six months prior to interview[2]				
Your own apartment or house	72.6% (233)	77.0% (134)	67.4% (99)	0.053
Friend's place	44.2% (142)	46.6% (81)	41.5% (61)	0.364
Other family member's house or place	20.9% (67)	20.7% (36)	21.1% (31)	0.930

[1] Based on international reporting requirements through the *Global AIDS Response Progress Report* (GARPR), though the GARPR indicator is based on respondents who report injecting drugs in the last month rather than the last six months.
[2] Participants were provided with a list of responses and were asked to check all those that applied to them. As participants could select more than one response, the total denominator is not shown.

Half of all participants (50.0%) reported that they had, at some time in their lives, used injection drugs, with a significantly higher proportion of male participants reporting a history of injection drug use **(Table 3)**. Among participants that reported having injected drugs at some time, 9.5% were found to be HIV seropositive based on testing of biological samples at the time of interview. Just under one-fifth (19.4%) of participants who had ever injected drugs reported that they had first done so before the age of 16; no significant differences were found between male and female participants. Overall, almost one-third of all participants (30.3%) had used injection drugs during the six months prior to interview, with no significant differences observed between males and females.

Of the 322 individuals who reported injection drug use in the six months prior to interview, the majority (98.8%) had used a clean needle and/or syringe during their last injection, with similar proportions observed among male and female participants. However, almost one-tenth (9.1%) had used a contaminated needle and/or syringe in the six months prior to interview and no significant differences were noted between males and females. With respect to the drugs or substances most commonly reported as being injected in the six months prior to interview, no significant differences were noted between males and females; cocaine, non-prescribed morphine and Ritalin were the three most commonly reported drugs used by both males and females. No significant differences were noted between males and females with respect to the people with whom they most often injected; among both males and females, friend(s) or people they knew well, followed by regular sex partner(s) were the most

commonly reported persons with whom injection occurred. Among both males and females, their own apartment or house was the most commonly reported location of injection in the six months prior to interview.

Several of the sexual behaviour indicators listed in the table below are consistent with those required for international reporting, namely the *Global AIDS Response Progress Report* (GARPR). Refer to the footnotes for specification of which indicators are consistent with GARPR.

Table 4: Sexual behaviours of A-Track pilot survey participants

Sexual behaviour	Total	Male	Female	p-value
Proportion who first had sexual intercourse before the age of 15 (among participants 16 to 24 years old, n=266)[1]	41.0% (109)	50.0% (58)	34.0% (51)	0.009
Proportion who had more than one sexual partner in the 12 months prior to interview (n=926)[1,2]	42.7% (395)	45.5% (210)	39.9% (185)	0.086
Proportion who had used a condom at last sexual intercourse (among participants aged 16 to 49 who reported having had more than one sexual partner in the 12 months prior to interview, n=393)[1]	52.7% (207)	57.7% (120)	47.0% (87)	0.035
Proportion who had a client sex partner in the 12 months prior to interview, n=876) [3]	7.2% (63)	3.1% (14)	11.4% (49)	<0.001
Proportion who used a condom at last sexual intercourse with a client sex partner (among participants who reported having had a client sex partner in the 12 months prior to interview, n=62)	82.3% (51)	78.6% (11)	83.3% (40)	0.682[4]

[1] Indicator for the *Global AIDS Response Progress Report*.
[2] This measure was derived from participants' responses to a series of questions related to the number of regular male sex partners, casual male sex partners, regular female sex partners, casual female sex partners, client sex partners and paid sex partners; only those participants that provided valid responses to at least one question in the series were included in the denominator.
[3] A client sex partner is defined as someone who has given the participant money, drugs, goods or anything else in exchange for sex. [4] Please note that due to small cell counts, Chi-squared results should be interpreted with caution.

It was found that a significantly higher proportion of male than female participants between the ages of 16 and 24 years had their first sexual intercourse prior to the age of 15 years (50.0% of males versus 34.0% of females) **(Table 4)**. Just under half (42.7%) of all participants reported having had more than one sexual partner in the 12 months prior to interview, with similar proportions observed among males and females. Among those participants between the ages of 16 and 49 years who reported having more than one sexual partner in the 12 months prior to interview, a significantly higher proportion of male participants had used a condom at last sexual intercourse (57.7% of males versus 47.0% of females). Among those participants who reported having had a client sex partner in the 12 months prior to interview, 82.3% reported using a condom at last sexual intercourse and no significant differences were noted between males and females.

Table 5: HIV testing, care and treatment of A-Track pilot survey participants

HIV testing, care and treatment	Total	Male	Female	p-value
Proportion who had ever tested for HIV (n=1049)	71.5% (750)	67.7% (360)	75.4% (390)	0.005
Proportion who had tested for HIV in the 12 months prior to interview (among participants who had ever tested for HIV, n=750)	67.6% (507)	68.9% (248)	66.4% (259)	0.469
Proportion who reported that they were currently under the care of a doctor for HIV (among participants who self-reported being HIV positive,	86.7% (26)	80.0% (12)	93.3% (14)	0.283[2]

n=30)[1]				
Proportion who had ever taken prescribed drugs for HIV (among participants who self-reported being HIV positive, n=30)	66.7% (20)	73.3% (11)	60.0% (9)	0.439

[1] Defined as a single visit or more to a doctor or other health professional in the six months prior to interview for HIV testing, treatment, counselling, etc.
[2] Please note that due to small cell counts, Chi-squared results should be interpreted with caution.

Just under three-quarters (71.5%) of participants reported that they had been tested for HIV at least once during their lifetime, and history of HIV testing was significantly higher among female than male participants **(Table 5)**. Of the 750 individuals who had ever been tested for HIV, 67.6% had been tested during the 12 months prior to the interview, with similar proportions among males and females. Among participants who reported being HIV positive, 86.7% reported that they were under the care of a doctor at the time of the interview and 66.7% reported that they had, at some time, taken prescription drugs for HIV. No significant differences were found between males and females.

Conclusion

Findings from the A-Track pilot survey are consistent with other findings that suggest Aboriginal populations in Canada are disproportionately affected by HIV (7-15). These findings also suggest that numerous risk behaviours may be contributing to the transmission of HIV and other blood-borne infections among Aboriginal populations and therefore underscore the continued need for health and social support services, as well as testing for HIV and other blood-borne infections. An analysis of the Aboriginal Social Determinants of Health would further inform service development and delivery by contextualizing the environments of risk and resilience that influence behaviours.

There are however limitations to the findings. The pilot survey only included Aboriginal people recruited at community and healthcare venues in Regina and thus, findings cannot be said to be representative of all Aboriginal people in Regina or of all Aboriginal people in Canada. In addition, the A-Track pilot survey findings are based on self-reported data and it is therefore possible that certain risk behaviours were over or underrepresented. These limitations notwithstanding, findings from the A-Track pilot survey – the first of its kind in Canada – provide valuable information for treatment and prevention services and programs at local, provincial and national levels. This surveillance data can be used to inform existing interventions and to design new strategies aimed at decreasing the risk of HIV and related infections among Aboriginal people in Canada.

In conclusion, this assessment of the pilot survey design and implementation processes and outputs has demonstrated the feasibility of such a behavioural and surveillance system for urban settings in Canada and provide lessons for use in future surveys of its kind.

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Conflict of interest

None

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