

# Demographics, Health-Care Utilization, and Substance Use Profiles of Older Adults in Canada's Lowest Income Neighbourhood



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## ABSTRACT

### Background

This study aimed to determine the baseline demographics, health status, and drug use profiles of current and former substance-using older adults in Vancouver's Downtown Eastside.

### Methods

Data were derived from two U.S. National Institutes of Health-funded cohort studies of current and former illegal drug users in Vancouver's Downtown Eastside. We used logistic regression of cross-sectional data obtained between June and November 2008 to calculate odds ratios and identify factors that were more commonly associated with cohort members being older adults (greater than or equal to age 50).

### Results

214 subjects (25%) were greater than or equal to age 50 upon study enrollment. Females (Adjusted Odds Ratio [AOR]: 0.50; 95% CI: 0.34–0.75) and individuals who reported Aboriginal ancestry (AOR: 0.49; 95% CI: 0.33–0.72) were less likely to be in the older cohort. Individuals with higher income (AOR: 2.07; 95% CI: 1.16–3.68 per \$1,000), and those with a regular place to stay were more likely to be in older cohort (AOR: 3.39; 95% CI: 1.90–6.06). Older participants accessed family physicians more frequently (OR: 1.47; 95% CI: 1.01–2.16) and were more likely to be actively taking (OR: 3.34; 95% CI 1.71–6.55) or have taken (OR 3.21; 95% CI 1.58–6.53) HIV antiretroviral therapy. There were no differences between groups in regard to injection drug use status or daily alcohol intake.

### Conclusions

Older current and former illegal drug users in a major inner city Canadian centre have different demographic, health-care,

and drug utilization profiles. Further studies in this population are warranted.

**Key words:** injection drug use, initiation, homeless, older adults

## INTRODUCTION

In North America, there is evidence of an emerging older adult population within urban street settings and homeless populations. Although there is no direct evidence from Canadian studies, the median age of homeless populations has increased from 34 to 47 over the last decade in the United States, while the absolute percentage of homeless adults over the age of 50 has increased from 10% to 30%.<sup>(1)</sup> Similar absolute percentages have been published in reports from Toronto and Edmonton.<sup>(2,3)</sup> Adults born in the second half of the baby boom (mid-1950s to 1964) are experiencing a sustained risk of being homeless.<sup>(4)</sup> Also, there is a trend towards increasing age of intravenous drug users (IDU). From 1979 to 2002 the mean age of IDU in the National Household Drug survey in the United States increased from 21 to 36 years, and the mean age of participants who reported having ever used drugs rose from 26 to 42 years of age.<sup>(5)</sup>

Older individuals in urban street settings are already known to have unique attributes. Being homeless accelerates the accumulation of comorbidities and functional deficits.<sup>(6,7)</sup> A previous study including adults aged 50–70 years from homeless shelters in Boston reported that the burden of geriatric chronic disease, functional impairment (activities of daily living), cognitive impairment, and incontinence exceeded the expected burden for adults who were 20 years older.<sup>(6)</sup> The older homeless are also more likely to die of cancer or heart disease than their younger counterparts, who are more likely to die from trauma, infectious disease or substance abuse.<sup>(8,9)</sup> While 50 years of age is not typically considered geriatric, this cohort of substance users may be considered equivalent to a geriatric population in terms of medical and functional impairment.

Drug abuse is more prevalent in younger populations. The rate of drug use by youth 15–24 years of age remains much higher than that reported by adults 25 years and older—three times higher for cannabis use (21.6% vs. 6.7%), and five times higher for past-year use of any one of five drugs excluding cannabis (4.8% vs. 1.1%).<sup>(10)</sup> However, the current demographic trend towards older age suggests that it will very important to understand the unique specific attributes of this growing older cohort in order to ensure a comprehensive urban health and homelessness management plan.

Using cross-sectional data from a longstanding cohort of substance using individuals from Vancouver's Downtown Eastside, we investigated whether there were socio-demographic differences in the health behaviours and health-care utilization patterns of older individuals in comparison to younger current and former illegal drug users.

## METHODS

### Participant Recruitment

Beginning in May 1996, persons who had reported injecting illegal drugs in the previous month were recruited into the Vancouver Injection Drug User Study (VIDUS), an ongoing prospective cohort study that has been described in detail previously.<sup>(11,12)</sup> Briefly, VIDUS inclusion criteria included: injection drug use in the previous month, residence in the greater Vancouver region, and provision of written informed consent. At baseline and semi-annually, participants provide blood samples and complete an interviewer-administered questionnaire. Participants receive 20 Canadian Dollars for each study visit. The questionnaire elicits demographic data, as well as information about drug use, HIV risk behaviour, and drug treatment.<sup>(11,12)</sup>

Additional data were derived from the AIDS Care Cohort to evaluate Exposure to Survival Services (ACCESS), an ongoing prospective observational cohort of HIV-infected illicit drug users in Vancouver, Canada. The methods for this study have been previously described.<sup>(13-16)</sup> Briefly, beginning in May 1996, participants were recruited through snowball sampling and extensive street outreach in the city's Downtown Eastside neighbourhood, the local epicentre of intravenous drug use and homelessness.<sup>(13)</sup> ACCESS eligibility criteria include: aged 18 years or older, HIV-infected, having used illicit drugs other than cannabinoids in the previous month, and having provided written informed consent. At baseline and every six-month follow-up interview, participants answer a standardized interviewer-administered questionnaire, are examined by a study nurse, and provide blood samples for serologic analysis.<sup>(13)</sup> The information on socio-demographics, drug use, and other behavioural characteristics gathered at each interview is augmented with data on HIV care and treatment outcomes from the British Columbia Centre for Excellence in HIV/AIDS Drug Treatment Programme.<sup>(13)</sup> Data from the last available follow-up (between June and November 2008)

for eligible participants were used for this analysis. Approval for both studies is granted on an annual basis by the Research Ethics Board at the University of British Columbia.

### Variables of Interest

The primary dependent variable of interest was age. We classified individuals as older adults if they were greater than or equal to 50 years of age at the time of the last available follow-up (between June and November 2008). The age of 50 was chosen because it has been previously used as a cutoff to define older homeless populations in the literature,<sup>(6,17)</sup> and also corresponded with the known increasing levels of frailty and medical comorbidities within urban street populations previously described.<sup>(6)</sup> Independent variables (population characteristics) of interest in this analysis included: gender, aboriginal ancestry, current homelessness, current relationship status, current employment, alcohol use (past six months), injection facility use (ever), income (per \$1000/month), hours spent socializing on the street, having a regular place to stay, and current daily drug use. The data from non-demographic variables were questions that were specific to HIV-negative individuals regarding health-care utilization and were obtained via self-reported activity (yes or no) any time in the last six months. These included reporting having a family physician, visits to a community clinic, visits to a specialist physician, visits to a methadone physician, hospital care, emergency room visits, visits to a prison physician, and access to other health care. HIV serostatus and Hepatitis C (HCV) self-reported infections were also assessed. Among HIV-positive individuals, we assessed use of HIV antiretroviral therapy (ART), intention to take ART, and current use of ART.<sup>(12-16)</sup>

### Statistical Methods

Variables potentially associated with older age, as defined above, were examined in bivariate analyses using Pearson's chi-square test and the Wilcoxon rank-sum test. Next, logistic regression was used to examine factors independently associated with older age in the cohort. Results are presented as the number and percentage of individuals within each category or (mean/median for the continuous variables) where appropriate, and odds ratios describing the likelihood of individuals within each category being greater than or equal to age 50, versus younger than age 50. The multivariate model was fit using an a priori defined model-building approach in which we adjusted for all variables that were statistically significant at the  $p < .05$  level in the bivariate analyses. Results of the multivariate analysis are presented as adjusted odds ratios (AOR) describing the odds of individuals within each category being greater than or equal to age 50, versus younger than age 50, after adjustment for other variables in the model. Adjustments for multiple comparisons were not completed. All  $p$  values are two-sided. Statistical analyses were performed using SAS software version 9.2 (SAS, Cary, NC).

## RESULTS

### General Characteristics - *Univariate Analysis*

Between June 2008 and November 2008, 855 individuals were recruited through street outreach, among whom 263 (30.8%) were HIV-positive and 214 (25%) were greater than 50 years of age. Females, individuals who report Aboriginal ancestry, the homeless, those who report being in a relationship, those who had ever used the InSite safer injecting facility, and current daily heroin injectors were less likely to be older adults (Table 1). The likelihood of being an older adult decreased with each additional reported hour of socializing. With increasing income (per \$1000), individuals were more likely to be older adults. Those who reported having a regular place to stay were also more likely to be in the older cohort. There were no differences in age group by current employment status, injection drug use status (past six months), or alcohol use (past six months).

### Health Utilization Behaviours - *Univariate Analysis*

In regard to health utilization behaviours which were restricted to the 592 HIV-negative participants (Table 2), those who had a family physician were more likely to be older adults. Individuals who were seen by a prison physician in the past six months were less likely to be older adults. There was no difference in age group by community clinic attendance, seeing a specialist physician, seeing a methadone physician, requiring hospitalization, visiting the emergency department, or accessing other health resources.

### Multivariate Analysis

In the multivariate logistic regression analyses, females and individuals who reported Aboriginal ancestry were less likely to be older adults. Those who reported having a higher income and having a regular place to stay were more likely to be older adults (Table 3).

### HIV and HCV Status - *Univariate Analysis*

Individuals who were actively taking (OR: 3.34; 95% CI 1.71–6.55) or who had previously taken antiretroviral therapy (ART) (OR 3.21; 95% CI 1.58–6.53) were more likely to be older adults. There were no differences in age group by HIV seropositivity (OR: 0.77; 95% CI: 0.51–1.08) or self-reported HCV status (OR: 0.98; 95% CI: 0.45–2.15).

## DISCUSSION

In the present study, we found that older age was associated with key differences in demographics, health utilization behaviours, and HIV therapeutic profiles.

Females in this study had lower odds of being in the older cohort. Several plausible explanations exist for this finding.

First is that the survival advantage females have compared to men in the general population is lost amongst IDUs. Canadian females' average life expectancy is 82 years, while for men it is 77 years.<sup>(18)</sup> Although the mortality rates for homeless people far exceed those of the general population, there is no evidence in the literature to suggest that the mortality rate in women is greater than men.<sup>(9,19-21)</sup> In fact, the evidence would suggest the opposite.<sup>(9,22)</sup> Other possible explanations include the presence of a sampling bias, which resulted in under-representation of females in the older age group. Also, potentially the presence of non-homeless IDUs in our study made this population not representative of other reported urban populations that were solely homeless.

First Nations peoples experience a disproportionate amount of homelessness amongst the Canadian population. Also, there is evidence to suggest that status, non-status, and Inuit First Nations all experience a decreased life expectancy when compared to the Canadian population.<sup>(23-25)</sup> In our study, individuals who identified themselves as Aboriginals had lower odds of being in the older cohort. Decreased survival could therefore be a plausible explanation for the discrepancy. To our knowledge, however, there is no evidence to suggest that a differential mortality rate between First Nations and non-First Nations exists specifically in the urban street or homeless populations. This makes the weighting behind this finding less robust. The same sampling bias noted within the female variable could also explain this finding.

With respect to their health-care utilization behaviours, the older cohort appeared to have more access to a family physician. However, there were no significant differences in their patterns of health-care utilization, including community health resource access, emergency department visits, or hospitalizations. Our initial thought was that increased medical frailty led them to maintain a relationship with a family physician; however, this is not in keeping with the lack of health-centre access or hospital visits. There is, to our knowledge, no specific literature within the urban street population to explain these findings. Older adults were less likely to access prison physicians, which may reflect the fact they were less likely to be incarcerated.

In our study, the older cohort was not different with respect to categorical intra-venous drug use, alcohol intake, or likelihood of having infectious complications such as HIV and HCV. However, individuals who had taken or who were currently taking ART were likely to be older. This is certainly a consideration when planning HIV treatment interventions for older HIV-positive individuals. The association between age and the likelihood of taking chronic disease medications needs to be further explored for a range of conditions in older indigent individuals, especially as new treatments for HCV and HIV emerge. Also, individuals who had ever used the InSite safer injection facility were less likely to be older. It is prudent to take this into consideration when planning harm reduction strategies for this cohort.

TABLE 1.  
Univariate analyses of sociodemographic, behavioural, and clinical characteristics of VIDUS2/ACCESS participants in individuals age 50 and above vs. individuals younger than 50 ( $n = 855$  individuals)

Characteristic	Age < 50	Age ≥ 50	Odds Ratio	95% Confidence Interval	p value
	N = 641 (75%)	N = 214 (25%)			
	N (%)	N (%)			
Gender					
Male	391 (61.0)	166 (77.6)	Ref		
Female	250 (39.0)	48 (22.4)	0.45	0.32–0.65	<0.001
Aboriginal ancestry					
No	372 (58.0)	167 (78.0)	Ref		
Yes	269 (42.0)	47 (22.0)	0.39	0.27–0.56	<0.001
Currently homeless					
No	410 (64.0)	179 (83.6)	Ref		
Yes	231 (36.0)	35 (16.4)	0.35	0.23–0.52	<0.001
Current relationship status					
Not single	400 (62.4)	150 (70.0)	Ref		
Single	241 (37.6)	64 (30.0)	0.71	0.51–0.99	<0.05
Current employment					
No	512 (80.0)	163 (76.2)	Ref		
Yes	129 (20.0)	51 (23.8)	1.24	0.86–1.80	0.25
Injecting drugs (previous six months)					
No	520 (81.1)	173 (80.8)	Ref		
Yes	121 (18.9)	41 (19.2)	1.02	0.69–1.51	0.92
Alcohol use (previous six months)					
No	341 (53.2)	102 (47.7)	Ref		
Yes	300 (46.8)	112 (52.3)	1.25	0.92–1.70	0.16
Injecting facility use (any previous use)					
No	151 (23.6)	70 (32.7)	Ref		
Yes	490 (76.4)	144 (67.3)	0.63	0.45–0.89	<0.01
Daily heroin use					
Yes	24 (11.2)	134 (20.9)	Ref	0.30–0.76	<0.01
Other	190 (88.8)	507 (79.1)	0.48		
Mean income					
Income (per \$1000/month)	0.868	0.950	2.87	1.70–4.85	<0.001
Socializing on the street					
Hours per day	3 (1-8)	2 (1-5)	0.96	0.94–0.99	0.020
Current regular place to stay					
No	168 (26.2)	16 (7.5)	Ref		
Yes	473 (73.8)	198 (92.5)	4.40	2.56–7.53	<0.001

Ref = Reference

As the general population ages, the percentage of older homeless individuals is also on the rise. Hahn *et al.*<sup>(1)</sup> described their local experience amongst the aging homeless population in San Francisco, California. The absolute percentage of older homeless adults was 25% in our study. This is in keeping with other estimates in Canada<sup>(2,3)</sup> and the Hahn paper published from San Francisco. It appears as though the population composition is similar in modern urban settings, and thus the results of this study may be generalizable to other centres in a limited fashion. Further characterization of this

emerging population across centres is warranted, with specific attention paid to the characteristics noted in our study.

This study also points to the underestimation of substance abuse, in particular intravenous drug use, in older adults. Alcohol use exceeding recommended weekly or monthly intake is estimated to be at 10% in the elderly, and is associated with poorer health status and functional status.<sup>(26,27)</sup> The rates of Benzodiazepine use amongst community-dwelling older adults in Quebec are similar, with up to 40% of users reporting symptoms of dependence.<sup>(28)</sup> In our current study, 25% of the cohort was

TABLE 2.  
Univariate analyses of health-care utilization in the last six months of HIV-negative VIDUS2 participants in individuals age 50 and above vs. individuals younger than 50 ( $n = 592$  individuals)

<i>Characteristic</i>	<i>Age &lt; 50</i>	<i>Age &gt; 50</i>	<i>Odds Ratio</i>	<i>95% Confidence Interval</i>	<i>p value</i>
	<i>438 (74%)</i>	<i>154 (26%)</i>			
	<i>N (%)</i>	<i>N (%)</i>			
Family physician					
No	191 (43.6)	53 (34.4)	Ref		
Yes	247 (56.4)	101 (65.6)	1.47	1.01–2.16	<0.05
Attends community clinic					
No	329 (75.1)	125 (81.2)	Ref		
Yes	109 (24.9)	29 (18.8)	0.70	0.44–1.11	0.13
Specialist physician					
No	405 (92.5)	139 (90.3)	Ref		
Yes	33 (7.5)	15 (9.7)	1.32	0.70–2.51	0.39
Methadone physician					
No	229 (52.3)	80 (51.9)	Ref		
Yes	209 (47.7)	74 (48.1)	1.01	0.70–1.46	0.94
Hospital care					
No	400 (91.3)	140 (90.9)	Ref		
Yes	38 (8.7)	14 (9.1)	1.05	0.55–2.00	0.89
Emergency room visit					
No	338 (77.2)	122 (79.2)	Ref		
Yes	100 (22.8)	32 (20.8)	0.89	0.57–1.39	0.60
Prison physician					
No	388 (88.6)	151 (98.1)	Ref		
Yes	50 (11.4)	3 (1.9)	0.15	0.05–0.50	<0.001
Accessed other health care					
No	414 (94.5)	145 (94.2)	Ref		
Yes	24 (5.5)	9 (5.8)	1.07	0.49–2.36	0.87

Ref = Reference

TABLE 3.

Results from multiple logistic regression of factors associated with being age 50 or above vs. younger than 50 among injection drug users ( $n = 771$ )

<i>Variable</i>	<i>Adjusted Odds Ratio (AOR)</i>	<i>95% Confidence Interval (CI)</i>	<i>p value</i>
Gender (Female vs. Male)	0.50	0.34–0.75	< 0.001
Aboriginal ancestry (Yes vs. No)	0.49	0.33–0.72	< 0.001
Individual income (per \$1000)	2.07	1.16–3.68	< 0.01
Regular place to stay (Yes vs. No)	3.39	1.90–6.06	< 0.001

greater than or equal to age 50, which suggests that a significant amount of intravenous drug use occurs among older adults.

Our study has several limitations. First, the study participants were not a random sample, and thus selection bias may limit the generalizability to all IDUs. Although the VIDUS

cohort was not based on a random sample, previous analyses have suggested that it is overall representative of the drug using population in the Downtown Eastside. Second, our study was a retrospective analysis and is open to all inherent retrospective biases. Third, the database and surveys were not designed to answer questions about age-related associations. Fourth, the elderly population was significantly smaller than comparator group, with only 25% of individuals being over the age of 50. It is possible that only the healthiest older intravenous drug users were included because the older, frailer, population could not make it out to complete the surveys, thus leading to a form of survivorship bias. Eligibility also required intravenous drug use at baseline and many older adults in the neighbourhood would not be using intravenous drugs. Nevertheless, this analysis provides a foundation for further investigation of the unique health needs of older adults in this setting.

## CONCLUSION

These findings highlight the unique attributes of older current and former illegal drug users in a major inner-city Canadian

centre. It is clear that aging population presents unique challenges where homelessness and drugs of abuse are considered. It is important to understand age-related differences in demographics, medical comorbidities, functionality, and health utilization behaviours that may be necessary for delivering appropriate public health interventions or medical care to this unique population.

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## CONFLICT OF INTEREST DISCLOSURES

The authors declare that no conflicts of interest exist.

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