

Final version published as Barker, B., Kerr, T., Dong, H., Wood, E., and DeBeck, K. (2017)  
History of being in government care associated with younger age at injection initiation among a cohort of  
street-involved youth. *Drug and Alcohol Review*.  
doi: 10.1111/dar.12513

## HISTORY OF BEING IN GOVERNMENT CARE ASSOCIATED WITH YOUNGER AGE AT INJECTION INITIATION AMONG A COHORT OF STREET-INVOLVED YOUTH

Brittany Barker, MPP, Research Assistant<sup>1,2</sup>

Thomas Kerr, PhD, Co-Director<sup>1,3</sup>

Huiru Dong, MSc, Statistician<sup>1</sup>

Evan Wood, MD, PhD, Co-Director<sup>1,3</sup>

Kora DeBeck, PhD, Research Scientist<sup>1,4</sup>

1. Urban Health Research Initiative, British Columbia Centre for Excellence in HIV/AIDS
2. Interdisciplinary Studies Graduate Program, University of British Columbia
3. Division of AIDS, Department of Medicine, University of British Columbia
4. School of Public Policy, Simon Fraser University

**Send correspondence to:**

Kora DeBeck, PhD  
Assistant Professor, School of Public Policy  
Simon Fraser University  
Research Scientist, Urban Health Research Initiative  
B.C. Centre for Excellence in HIV/AIDS  
St. Paul's Hospital  
608-1081 Burrard Street, Vancouver, B.C., V6Z 1Y6  
Canada  
**Tel:** (604) 558-6679  
**Email:** uhri-kd@cfenet.ubc.ca

## Abstract

**Introduction and Aims:** Compared to the general population of youth, health-related disparities experienced by youth exposed to the child welfare system are well documented. Amongst these vulnerabilities are elevated rates of substance use, including injection drug use; however, less is known about when these youth transition to this high-risk behaviour. We sought to assess whether having a history of government care is associated with initiating injection drug use before age 18.

**Design and Methods:** Between September 2005 and May 2014, data were derived from the At-Risk Youth Study, a cohort of street-involved youth who use illicit drugs in Vancouver, Canada. Multivariable logistic regression analysis was employed to examine the relationship between early initiation of injection drug use and having a history of being in government care.

**Results:** Among the 581 injecting street-involved youth included, 229 (39%) reported initiating injection drug use before 18 years of age. In multivariable analysis, despite controlling for a range of potential confounders, having a history of government care remained significantly associated with initiating injection drug use before age 18 (adjusted odds ratio = 1.69; 95% confidence interval: 1.15–2.48).

**Discussion and Conclusions:** Youth with a history of being in government care were significantly more likely to initiate injection drug use before age 18 than street-involved youth without a history of being in care. These findings imply that youth in the child welfare system are at higher-risk and suggest interventions are needed to prevent transitions into high-risk substance use among this population.

*Keywords:* child welfare system; injection initiation; street-involved youth; government care; HIV risk behaviour

## Introduction

Compared to the general population of youth, youth exposed to the child welfare system experience a disproportionate burden of homelessness (1, 2), incarceration (1), unplanned pregnancies (3), **high school drop-outs** (1, 4), mental and physical health issues (1, 3), and substance use (4). Previous research found that among street-involved youth, those with a history of government care were more likely to start using “hard” drugs (i.e., heroin, cocaine, crack, crystal methamphetamine) at an earlier age than street-involved youth without a history of care (4). Much research to-date has suggested initiating injection drug use at an earlier age is associated with high-risk practices such as, binge drug use, sex work, incarceration, and increased likelihood of HIV and HCV infection (5, 6). However, it is unclear whether youth who have been in government care initiate injection drug use at an earlier age. Due to the high number of former government care youth who end up street-involved (1, 2, 4), we undertook the current analysis to investigate whether having a history of being in government care is associated with initiating injection drug use at an earlier age among street-involved youth who inject drugs.

## Methods

Data for this study were collected between September 2005 and May 2014, from the At-Risk Youth Study (ARYS), a cohort of street-involved youth in Vancouver, Canada. Youth were eligible if they were between the ages of 14-26 at time of enrolment, had used illicit ‘hard’ drugs in the past 30 days (e.g., crack, cocaine, heroin, crystal methamphetamine), were street-involved, defined as being absolutely or temporarily without stable housing or having used a service for street-involved youth in the past year, and provided written informed consent. The study has been described in detail elsewhere (7). Our main outcome of interest was age at first injection drug use, defined as the age youth reported the first time they used a needle to “chip, fix or

muscle” (<18 years of age vs.  $\geq$ 18 years of age). Age 18 was selected as our cutoff as it was the median age of injection initiation among our sample, and is also generally seen as a legal and developmentally important transition from adolescence to young adulthood (6, 8). At baseline, participants were asked to report any history of injection drug use, which was subsequently asked at each study follow-up interview to assess injection initiation over the study period. Our primary independent variable of interest was having a history of being in government care, defined as, having ever been placed in an orphanage, foster home, group home, being a ward of the state, or away from parents for longer than a month (not including vacations), before turning the legal age of majority. For more information regarding study details and covariate selection see supplemental material.

We first stratified descriptive characteristics by age at injection initiation (<18 vs.  $\geq$ 18). We then evaluated the bivariable association between each explanatory variable and the outcome of interest using logistic regression. To evaluate the relationship between age at injection initiation and having a history of being in government care, all variables described above were adjusted in a fixed multivariable logistic regression model. All statistical analyses were performed using SAS software version 9.3 (SAS, Cary, NC). All *p*-values are two sided.

## **Results**

Over our study period, 1159 youths enrolled in the ARYS cohort among whom, 581 reported injection drug use at baseline (n=490, 84%) or over study follow-up (n=91, 16%) and were therefore included in this analysis. Compared to ARYS participants who were injecting naïve and therefore illegible for this analysis, participants in our study were more likely to be older ( $p<0.001$ ) and Caucasian ( $p=0.001$ ); however there were no significant differences in gender ( $p=0.886$ ) or histories of being in government care ( $p=0.273$ ) between groups. In total, 33

(5.7%) observations involved missing values and were therefore excluded from the multivariable analysis. Among this sample, 182 (31%) were female and the median age was 22 (IQR: 21-24). In total, 229 (39%) participants reported initiating injection drug use before the age of 18.

The results of the descriptive statistics, bivariable and multivariable analyses are presented in Table 1. After adjusting for gender, ethnicity, parental/guardian substance use, having a history of sexual and physical abuse and emotional and physical neglect, having a history of being in government care remained significantly and positively associated with initiating injection drug use before age 18 (adjusted odds ratio = 1.98; 95% confidence interval: 1.37 – 2.85).

### **Discussion**

After controlling for multiple **covariates** factors related to initiating injection drug use, having a history of being in government care was independently associated with initiating injection drug use before age 18. Youth in government care frequently do not have positive adult role models or strong familial supports (9), resulting in increased economic and social vulnerability which may account for the higher observed risk of earlier injection initiation. Although our study cannot establish causation, our findings clearly highlight that targeted prevention and intervention services are needed for this population.

Prior research suggests that injection prevention programs designed in collaboration with peers may be effective in dissuading injecting naïve youth from transitioning to injection drug use by sharing personal experiences and providing mentorship (5, 10). However, the limits of interventions focused on individual-level behavioural change are well described (11, 12), and greater attention to structural-level reforms to meaningfully support vulnerable populations has been called for (13, 14). In public health, structural interventions refer to those that promote and

improve health by altering the determinants of health and the environmental context in which people live (13). Interventions that facilitate the development of positive social networks, economic security, access to health and social services, and mental health support that promote resiliency in youth may mitigate problematic substance use and future risk behaviours (15-17). Similarly, many of the same structural interventions have been recommended for youth exposed to the child welfare system (18, 19), as both populations have overlapping characteristics.

In studies of both injection initiation and cessation, homelessness was found to independently predict a higher likelihood of either continued, or initiated, injection drug use compared to those who were stably housed (20, 21). Indeed, evidence suggests housing is one of the most important social determinants of health and given that both, street-involved and former government care youth experience difficulty accessing and sustaining housing (1, 2, 22), increasing the public stock of low-threshold, youth-focused housing is imperative. The risk for homelessness is especially high for youth who have recently “aged-out” of the child welfare system (in most jurisdictions government support is terminated at the legal age of majority). Independent living programs (IPLs) provide a continuum of support and services such as, housing, life skills development, employment training, and mentorship to aid recently emancipated youth in transitioning to full independence. A review of IPLs found promising results with a number of key indicators including, educational attainment, employment, health, and housing (23). Comprehensive evidence-based strategies, like IPLs, are required to address the multi-faceted needs of youth who have been in government care. With regard to delaying or preventing injection initiation, prior research has found an association between inability to access addiction treatment and initiating injection drug use (24), and similarly, a protective effect from engaging in addiction treatment in preventing transitions to injection drug use (25).

Although not the primary inquiry of this paper, the unexpected negative association between initiating injection drug use at a younger age and having a parent or guardian who engaged in substance use warrants discussion. Parental and guardian substance use is a known risk factor for substance use among adolescents (26), and it is noteworthy that the prevalence of parental substance use was very high among both early and later injection initiators (90% and 97% respectively). While it would be expected that youth who are not exposed to parental/guardian substance use at an earlier age would be more likely to delay transitions to more risky substance use, it is well documented that resilience is not a static characteristic and may change over time or in different contexts (27). Further research is merited.

This study has limitations. First, as with all community-recruited research cohorts, the ARYS cohort is not a random sample and therefore may not generalise to other populations of street youth or youth in government care. Second, data were collected using self-reported interviews and is thus vulnerable to response bias. Third, the relationship between being in government care and injection initiation could be influenced by confounders not measure by our study instrument. Lastly, as this analysis is cross-sectional we cannot ascertain temporality, and therefore it is possible that our outcome (injection initiation <18 years of age) may have preceded exposure to government care.

In conclusion, this study found that having a history of being in government care was associated with initiating injection drug use before the age of 18. Given the harms associated with initiating injection drug use at a younger age, findings highlight the urgent need to implement interventions to better support and prevent this vulnerable population from transitioning to high-risk substance use.

**Acknowledgments:**

The authors thank the study participants for their contribution to the research, as well as current and past researchers and staff. We would specifically like to thank Cody Callon, Jennifer Matthews, Deborah Graham, Peter Vann, Steve Kain, Tricia Collingham, Kristie Starr, and Carmen Rock for their research and administrative assistance. The study was supported by the US National Institutes of Health (R01DA028532, U01DA038886) and the Canadian Institutes of Health Research (MOP-102742). This research was undertaken, in part, thanks to funding from the Canada Research Chairs program through a Tier 1 Canada Research Chair in Inner City Medicine, which supports Dr. Evan Wood. Dr. Kora DeBeck is supported by a MSFHR/St. Paul's Hospital Foundation-Providence Health Care Career Scholar Award and a Canadian Institutes of Health Research New Investigator Award. Brittany Barker is supported by a Canadian Institutes of Health Research Doctoral Award. Funding sources had no further role in the study design; in the collection, analysis and interpretation of data; in the writing of the report; or in the decision to submit the paper for publication.



## REFERENCES

- [1] Fowler P, Toro P, Miles B. Pathways to and from homelessness and associated psychosocial outcomes among adolescents leaving the foster care system. *American Journal of Public Health* 2009;99:1453-58.
- [2] Dworsky A, Napolitano L, Courtney M. Homelessness during the transition from foster care to adulthood. *American Journal of Public Health*. 2013;103:S318-S23.
- [3] Mendes P. Graduating from the child welfare system: a case study of the leaving care debate in Victoria, Australia. *J Soc Work*. 2005;5:155-71.
- [4] Barker B, Kerr T, Alfred G, Fortin M, Nguyen P, Wood E, et al. High prevalence of exposure to the child welfare system among street-involved youth in a Canadian setting: implications for policy and practice. *BMC Public Health* 2014;14(1):197-204.
- [5] Miller CL, Strathdee SA, Kerr T, Li K, Wood E. Factors associated with early adolescent initiation into injection drug use: implications for intervention programs. *The Journal of Adolescent Health* 2006;38(4):462-64.
- [6] Aquilino WS. From adolescent to young adult: a prospective study of parent-child relations during the transition to adulthood. *Journal of Marriage and Family* 1997;59(3):670-86.
- [7] Wood, Stoltz J-A, Montaner J, Kerr T. Evaluating methamphetamine use and risks of injection initiation among street youth: the ARYS study. *Harm Reduction Journal* 2006;3(1):18.
- [8] Osgood DW, Foster EM, Courtney ME. Vulnerable populations and the transition to adulthood. *The Future of Children* 2010;20(1):209-29.
- [9] Courtney M, Piliavin I, Grogan-Kaylor A, Nesmith A. Foster youth transitions to adulthood: a longitudinal view of youth leaving care. *Child Welfare* 2001;80:685-717.
- [10] Roy É, Haley N, Leclerc P, Boudreau J, Boivin J. Risk factors for initiation into drug injection among adolescent street youth. *Drugs: Education, Prevention & Policy* 2007;14(5):389-99.
- [11] Yen IH, Syme SL. The social environment and health: a discussion of the epidemiologic literature. *Annual Review of Public Health*. 1999;20(1):287-308.
- [12] Rose G. Sick individuals and sick populations. *International Journal of Epidemiology* 2001;30(3):427-32.
- [13] Blankenship KM, Friedman SR, Dworkin S, Mantell JE. Structural interventions: concepts, challenges and opportunities for research. *Journal of Urban Health* 2006;83(1):59-72.
- [14] Des Jarlais DC. Structural interventions to reduce HIV transmission among injecting drug users. *AIDS* 2000;14:S41-S6.
- [15] Slesnick N, Kang MJ, Bonomi AE, Prestopnik JL. Six- and twelve-month outcomes among homeless youth accessing therapy and case management services through an urban drop-in center. *Health Services Research* 2008;43:211-29.
- [16] Reutter L, Hungler K, Letourneau N, Makwarimba E, Stewart M. Supporting homeless youth: perspectives and preferences. *Journal of Poverty* 2010;14(2):145-65.

- [17] Hwang SW, Burns T. Health interventions for people who are homeless. *The Lancet*. 2014;384(9953):1541-7.
- [18] Barnow BS, Buck A, O'Brien K, Pecora P, Ellis ML, Steiner E. Effective services for improving education and employment outcomes for children and alumni of foster care service: correlates and educational and employment outcomes. *Child & Family Social Work*. 2015;20:159-70.
- [19] Nesmith A, Christophersen K. Smoothing the transition to adulthood: Creating ongoing supportive relationships among foster youth. *Children and Youth Services Review*. 2014;37:1-8.
- [20] Shah NG, Galai N, Celentano DD, Vlahov D, Strathdee SA. Longitudinal predictors of injection cessation and subsequent relapse among a cohort of injection drug users in Baltimore, MD, 1988–2000. *Drug and Alcohol Dependence*. 2006;83:147-56.
- [21] Roy É, Haley N, Leclerc P, Cédras L, Blais L, Boivin J-F. Drug injection among street youths in montreal: predictors of initiation. *Journal of Urban Health* 2003;80(1):92-105.
- [22] Barker B, Kerr T, Nguyen P, Wood E, DeBeck K. Barriers to health and social services for street-involved youth in a Canadian setting. *J Public Health Pol* 2015;36(3):350-63.
- [23] Montgomery P, Donkoh C, Underhill K. Independent living programs for young people leaving the care system: the state of the evidence. *Child Youth Serv Rev*. 2006;28:1435-48.
- [24] DeBeck K, Kerr T, Nolan S, Dong H, Montaner J, Wood E. Inability to access addiction treatment predicts injection initiation among street-involved youth in a Canadian setting. *Substance Abuse Treatment, Prevention, and Policy*. 2016;11:1-5.
- [25] Kelley MS, Chitwood DD. Effects of drug treatment for heroin sniffers: a protective factor against moving to injection? *Social Science & Medicine*. 2004;58:2083-92.
- [26] Yule AM, Wilens TE, Martelon MK, Simon A, Biederman J. Does exposure to parental substance use disorders increase substance use disorder risk in offspring? A 5-year follow-up study. *The American Journal on Addictions*. 2013;22:460-5.
- [27] Luthar SS, Cicchetti D, Becker B. The construct of resilience: A critical evaluation and guidelines for future work. *Child Development*. 2000;71:543-62.