Youth Homelessness: Risk Factors and Outcomes

INTRODUCTION

The Child and Youth Data Laboratory[a] takes a multi-year, cumulative look at the service use of Albertan children and youth to better understand their experiences as they develop. This report on youth homelessness emerged from a workshop in which PolicyWise worked with our ministry partners to identify topics where further information would be of benefit across many ministries. One of the populations of interest was homeless youth. Our partners wanted more information on factors that lead to an increased risk of homelessness in Alberta's youth, and what outcomes homeless youth were more likely to experience in the future.

Homelessness is hazardous to the health and well-being of youth. Youth experiencing homelessness often face serious risks including victimization substance use and abuse, poor nutrition, and limited access to primary healthcare and other services. Studies across Canada revealed that youth who are homeless were more likely to report physical abuse or sexual assault while living on the street.[1] Additionally, a higher rate of suicide and mortality exists among youth who are homeless than the general population of youth.[2,3] The majority of street youth in Canada report experiencing physical, sexual or emotional abuse in their families of origin, abuse that started, on average, at 12 years old and continued for four to six years prior to the youth leaving home.[4,5,6]

KEY FINDINGS

Youth who received a diagnostic code from a physician indicating visible homelessness in the last four years of the study (2007/08-2010/11) have had the following risk factors in the first two years of the study (2005/06 and 2006/07). As compared to housed youth, homeless youth were:

- **28 times more likely to have sought medical attention for physical, sexual, or emotional abuse or neglect in the past**
- **10 times more likely to have sought medical attention for assault in the past**
- **5 times more likely to have a received a Special Education code**
- **19 times more likely to have been charged with an offence in the past**
- **More likely to have received a diagnostic code for a mental health condition, substance use or alcohol dependence in the past**

Youth who received a diagnostic code for homelessness in the first four years of the study (2005/06-2008/09) were more likely to have the following health, social and justice outcomes in the 2009/10 - 2010/12 fiscal years. Homeless youth were:

- **14 times more likely to receive Income Support**
- **10 times more likely to be charged with an offence**
- **8 times more likely to be assaulted**
- **10 times more likely to receive a substance use or alcohol dependence code**
- **15 times more likely to receive a bipolar diagnostic code**
- **Females were 7 times more likely to receive a diagnostic code for delivery of a child**

While youth with a diagnostic code for visible homelessness are likely the most marginalized homeless youth, indicators such as abuse, assault, mental health, substance use and alcohol dependence are known to be under-reported in administrative data. Therefore these are likely conservative estimates of the proportion of youth who have had those experiences and conditions.

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[a] This report is part of the Longitudinal Project conducted by the CYDL in collaboration with Alberta partnering government ministries. Please see the last page for a brief description of the project and go to https://policywise.com/data/p2/ to access other deliverables.

This report describes risk factors for homelessness and outcomes stemming from homelessness in youth aged 14-17 years in the 2005/06 fiscal year. It is divided into two parts. Part 1 follows youth through time to determine what characteristics at the beginning of the study are associated with a diagnostic code for visible homelessness later in the study. Part 2 takes youth who received a diagnostic code for visible homelessness in the 2005/06 to 2008/09 fiscal years and describes the health, social and justice-related outcomes they experienced in the 2009/10 to 2010/11 fiscal years.

Linked administrative data from the Child and Youth Data Laboratory's Longitudinal Project were used as they are well suited for analyses that require cross-ministerial consideration. To define homelessness, diagnostic codes for homelessness were used from physician, hospital, outpatient clinic and emergency room administrative data. There are three significant limitations to using this method[b]: (a) approximately 10-20% of homeless youth are likely identified using this method, (b) only those homeless youth who sought medical attention would be captured in this report, and (c) the indicator used in this report is more likely an indicator of youth who are visibly homeless or have conditions stereotypically associated with homelessness as the medical team would be more likely to use the homelessness diagnostic code if there was some reason for them to inquire about, or suspect, homelessness. It is less likely, therefore, that couch surfers or other less visibly homeless youth would be captured. For this reason, the indicator will be referred to as diagnostic codes for visible homelessness.

While there are significant limitations, using linked administrative data provides a rare opportunity to follow youth through time to determine risk factors for visible homelessness and describe what outcomes visibly homeless youth are more likely to face in the future. See Appendix A for data notes that further describe the data and the methods.

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[b] See Appendix A for an in-depth analysis of the strengths and limitations of the homelessness variable and a comparison to published estimates of homelessness in Alberta.

PART 1: RISK FACTORS FOR VISIBLE HOMELESSNESS

To investigate youth on the cusp of adulthood, youth aged 14-17 years in 2005/06 were followed longitudinally over time to determine what factors in the first two years of the study predicted youth being given a diagnostic code for homelessness in the 2007/08 - 2010/11 fiscal years (Figure 1).
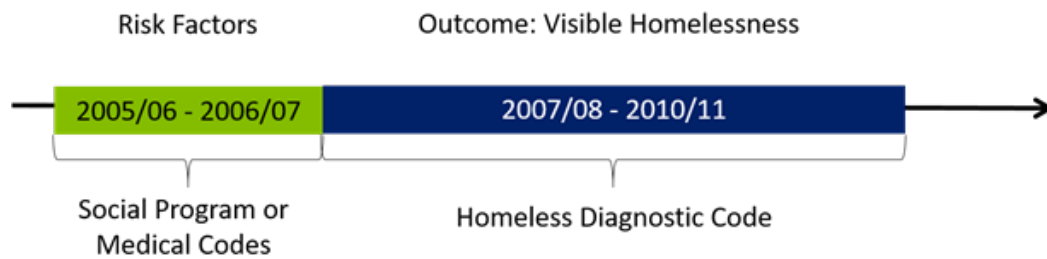

Figure 1. **Depiction of the study method. Youth were followed over time to determine what factors at the beginning of the study (2005/06 - 2006/07) were associated with the receipt of a diagnostic code for visible homelessness later in the study (2007/08 - 2010/11)**

There were 168 youth who received a diagnostic code for visible homelessness in the last four years of the study, and 174,387 youth who did not. As compared to youth without a homeless diagnostic code, youth who received a diagnostic code for visible homelessness were:

- 28 times more likely to have received a diagnostic code for physical, sexual, or psychological abuse or neglect in the past (2005/06 to 2006/07)
- 10 times more likely to have received a diagnostic code for assault in the past
- 5 times more likely to have a record of receiving a Special Education code while in school in the past
- 19 times more likely to have been charged with an offence in the past
- 16 times more likely to have been involved in the provincial correctional system in the past
- 14 times more likely to have received a diagnostic code for substance use or alcohol dependence in the past
- Much more likely to have received a diagnostic code for a mental health condition in the past
  - 60 times higher for schizophrenia
  - 27 times higher for conduct disorder
  - 22 times higher for personality disorder
  - 20 times higher for bipolar disorder
  - 15 times higher for adjustment disorder
  - 10 times higher for ADD/ADHD
  - 7 times higher for depression
  - 5 times higher for anxiety
- Females with a homeless diagnostic code were 5 times more likely to have received a diagnostic code for pregnancy in the past and 9 times more likely to have received a diagnostic code for a live birth.

While the number of youth who received diagnostic codes for visible homelessness in the last four years of the study is small, all of the above comparisons are statistically significant (Figure 2; Table 1).

Table 1. **Risk Factors for receipt of a diagnostic code for visible homelessness in 2007/08 – 2010/11**

Risk Factors in 2005/06-2006/07	Homeless Diagnostic Code in 2007/08 - 2010/11			No Homeless Diagnostic Code in 2007/08 - 2010/11				
	Numerator/ Denominator	Percent (%)	95% CI	Numerator/ Denominator	Percent (%)	95% CI	Risk Ratio	95% CL
Physical Health								
Abuse Diagnostic Code	9/352	3.0%	1.3-4.9	157/174173	0.1%	0.1-0.1	28.4	14.6-55.1
Assault Diagnostic Code	27/3219	0.8%	0.6-1.2	139/171306	0.1%	0.1-0.1	10.3	6.9-15.6
Substance Use and Alcohol Dependence Diagnostic Code	55/5768	1.0%	0.7-1.2	111/168757	0.1%	0.1-0.1	14.5	10.5-20.0
Mental Health								
Depression Diagnostic Code	46/9424	0.5%	0.4-0.7	120/165101	0.1%	0.1-0.1	6.7	4.8-9.4
Anxiety Diagnostic Code	26/5799	0.4%	0.3-0.7	140/168726	0.1%	0.1-0.1	5.4	3.6-8.2
Bipolar Disorder Diagnostic Code	17/984	1.7%	1.1-2.8	149/173541	0.1%	0.1-0.1	20.1	12.2-33.1
Adjustment Disorder Diagnostic Code	35/3064	1.1%	0.8-1.6	131/171461	0.1%	0.1-0.1	15.0	10.3-21.7
Personality Disorder Diagnostic Code	13/685	1.9%	1.1-3.3	153/173840	0.1%	0.1-0.1	21.6	12.3-37.8
Schizophrenia Diagnostic Code	13/249	5.2%	3.0-8.8	153/174276	0.1%	0.1-0.1	59.5	34.2-103.3
ADD/ADHD Diagnostic Code	39/5395	0.7%	0.5-1.0	127/169130	0.1%	0.1-0.1	9.6	6.7-13.8
Conduct Disorder Diagnostic Code	42/2172	1.9%	1.4-2.6	124/172353	0.1%	0.1-0.1	26.9	19.0-38.0
Social Circumstances								
Special Education	63/19543	0.3%	0.3-0.4	103/154982	0.1%	0.1-0.1	4.9	3.5-6.6
Charged with an Offence	70/6359	1.1%	0.9-1.4	96/168166	0.1%	0.1-0.1	19.3	14.2-26.2
Corrections	63/6365	1.0%	0.8-1.3	103/168160	0.1%	0.1-0.1	16.2	11.8-22.1
Pregnancy	11/3622	0.3%	0.2-0.6	54/81805	0.1%	0.1-0.1	4.6	2.4-8.8
Delivery	suppressed	-	-		-	-	9.1	4.3-19.0

Figure 2. Risk factors for receipt of a diagnostic code for visible homelessness
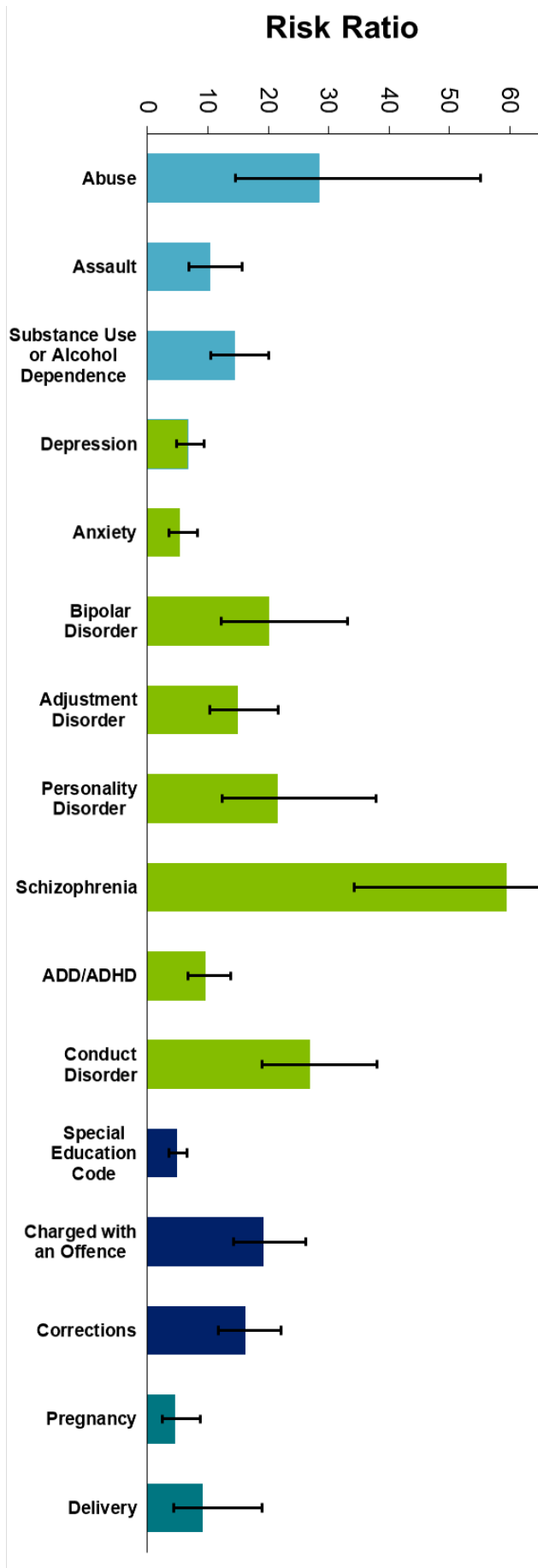
PART 2: OUTCOMES OF VISIBLE HOMELESSNESS

Youth aged 14-17 years in 2005/06 were followed longitudinally over time to determine whether receiving a diagnostic code for visible homelessness in the first four years of the study was associated with more negative health, social, and justice outcomes in the 2009/10 – 2010/11 fiscal years (Figure 3).

Risk Factor: Visible Homelessness   Outcomes

2005/06 – 2008/09   2009/10 – 2010/11

Homeless Diagnostic Code   Social Program or Medical Codes

Figure 3. **Depiction of the study method. Youth aged 14-17 years were followed over time to compare outcomes between youth who received a diagnostic code for visible homelessness and youth who did not**

There were 99 youth who received a diagnostic code for visible homelessness in the first four years of the study, and 174,456 who did not. Youth who received a homeless diagnostic code in the first four years of the study were more likely to have the following outcomes in the last two years of the study than youth who did not receive a homeless diagnostic code (Figure 4; Table 2):

- 11 times more likely to move more than three times in two years
- 8 times more likely to receive a diagnostic code for assault
- 7 times more likely to receive a diagnostic code for traumatic brain injury
- 10 times more likely to receive a diagnostic code for substance use or alcohol dependence
- 10 times more likely to be charged with an offence
- 13 times more likely to receive Income Support
- 3 times more likely to have a physical trauma, such as a car accident, assault, unintentional fall or burn[c]
- More likely to receive a diagnostic code for a mental health condition
  - 31 times higher for schizophrenia
  - 24 times higher for personality disorder
  - 15 times higher for bipolar disorder
  - 10 times higher for adjustment disorder
  - 5 times higher for depression
  - 4 times higher for anxiety
- Female youth with a homeless diagnosis code were 5 times more likely to receive a diagnostic code for pregnancy and 7 times more likely to receive a diagnostic code for a live birth, than female youth without a homeless diagnostic code.

All of the above comparisons are statistically significant (Figure 4; Table 2). Note that 62% of homeless youth had a physical trauma, 48% received Income Support, 49% were charged with an offence, 40% received a depression diagnostic code and 51% received a substance use or alcohol dependence diagnostic code (Figure 5; Table 2). 67% of female homeless youth received a pregnancy diagnostic code.

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[c] CIHI 2006 Head Injuries in Canada: A Decade of Change (1994-1995 to 2003-2004).
https://secure.cihi.ca/free_products/ntr_head_injuries_2006_e.pdf Please see data notes for additional details.

Table 2.   Diagnostic code for homelessness as a risk factor for health and social outcomes in 2009/10 and 2010/11

| Risk Factors in 2005/06-2006/07	Homeless Diagnostic Code in 2005/06-2008/09			No Homeless Diagnostic Code in 2005/06-2008/09				
	Numerator/ Denominator	Percent (%)	95% CI	Numerator/ Denominator	Percent (%)	95% CI	Risk Ratio	95% CI
Physical Health								
Assault Diagnostic Code	22/99	22%	15.1-31.4	4838/174456	3%	2.7-2.9	8.0	5.5-11.6
Trauma Diagnostic Code	61/99	62%	51.8-70.6	38218/174456	22%	21.7-22.1	2.8	2.4-3.3
Substance Use and Alcohol Dependence Diagnostic Code	50/99	51%	40.8-60.2	9013/174456	5%	5.1-5.3	9.8	8.0-11.9
Mental Health								
Depression Diagnostic Code	40/99	40%	31.3-50.3	13430/174456	8%	7.6-7.8	5.2	4.1-6.7
Anxiety Diagnostic Code	20/99	20%	13.4-29.2	9550/174456	5%	5.4-5.6	3.7	2.5-5.5
Bipolar Disorder Diagnostic Code	15/99	15%	9.3-23.6	1827/174456	1%	1.0-1.1	14.5	9.1-23.1
Adjustment Disorder Diagnostic Code	18/99	18%	11.7-27.0	3290/174456	2%	1.8-2.0	9.6	6.3-14.7
Personality Disorder Diagnostic Code	16/99	16%	10.1-24.8	1167/174456	1%	0.6-0.7	24.2	15.4-38.0
Schizophrenia Diagnostic Code	10/99	10%	5.4-17.8	567/174456	0.3%	0.3-0.4	31.1	17.2-56.3
Social Circumstances								
3 or More Residential Moves	16/99	16%	10.1-24.8	2602/174456	1%	1.4-1.5	10.8	6.9-17.0
Charged with an Offence	49/99	49%	39.9-59.2	9129/174456	5%	5.1-5.3	9.5	7.7-11.6
Received Income Support	48/99	48%	38.9-58.2	6338/174456	4%	3.5-3.7	13.4	10.9-16.4
Pregnancy Diagnostic Code	28/42	67%	51.5-79.1	11812/85399	14%	13.6-14.1	4.8	3.9-6.0
Delivery Diagnostic Code	20/42	48%	33.4-62.3	5931/85399	7%	6.8-7.1	6.9	5.0-9.4
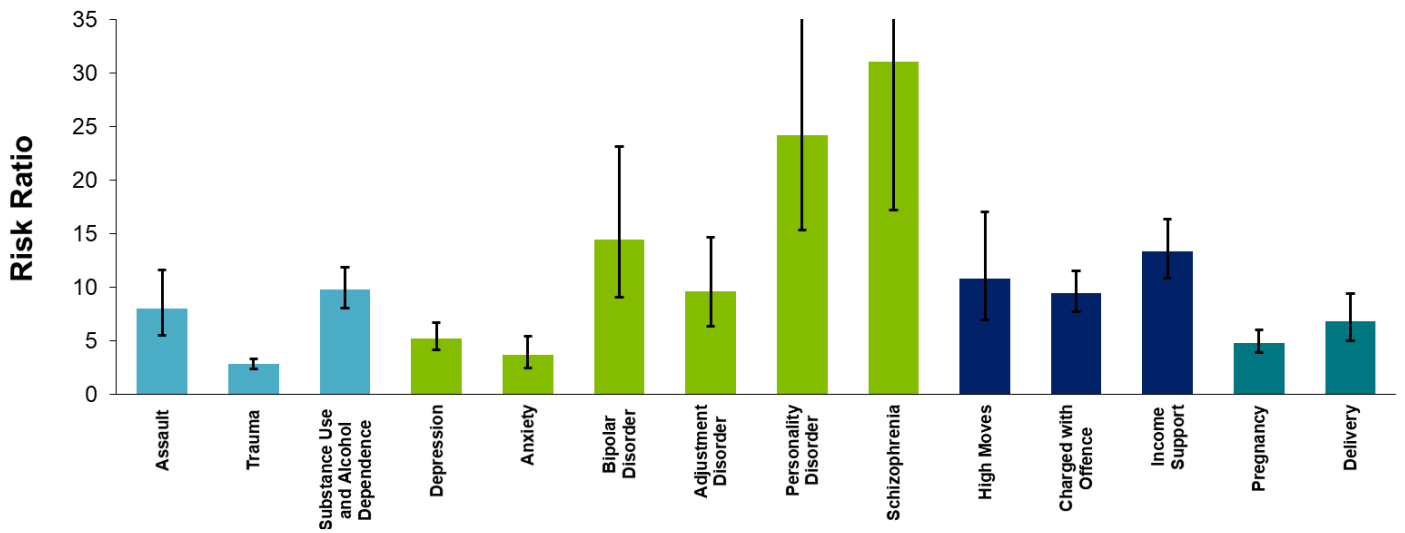
Figure 4. Visible homelessness as a risk factor for health and social outcomes in 2009/10 and 2010/11
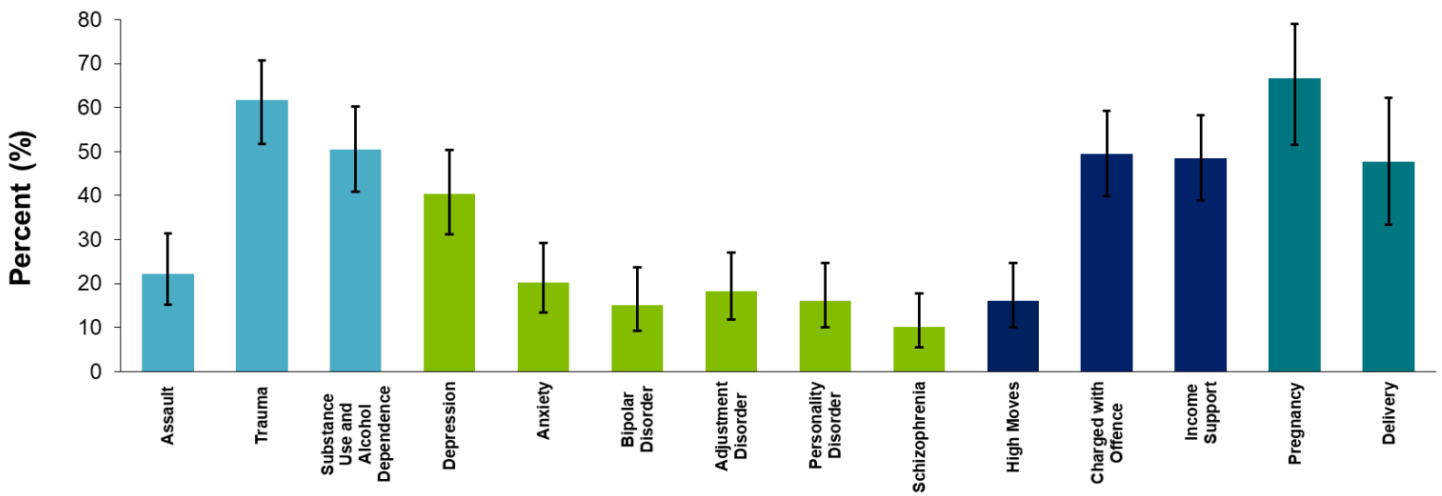

Figure 5. Proportion of visibly homeless youth who experienced health and social outcomes in 2009/10 and 2010/11

SUMMARY

This study used linked administrative data to describe risk factors for visible homelessness and outcomes of visible homelessness in youth. Youth aged 14 to 17 years in 2005/06 who received diagnostic codes indicating they had been abused or assaulted were 28 times and 10 times, respectively, more likely to later receive a diagnostic code for visible homelessness. Youth were more likely to receive a diagnostic code for visible homelessness in the future if they had been charged with an offense, had been in the provincial correctional system, had received a special education code, or had received diagnostic codes for substance use, alcohol dependence, or mental health conditions. Female youth who became pregnant or gave birth were also more likely to receive a diagnostic code for visible homelessness in the future.

Youth who were visibly homeless in the first four years of the study were more likely to later receive Income Support, be charged with an offence, be assaulted, have a diagnostic code for bipolar disorder, or substance use or alcohol dependence. Finally, females who were visibly homeless in the first four years of the study were 7 times more likely to receive a diagnostic code for a live birth later in the study.

This report provides valuable insights into the social context of visibly homeless youth in Alberta. Taken together, these results demonstrate that youth homelessness is related to a complex constellation of social and health vulnerabilities. Pathways into and out of homelessness are known to be complex.[6] These data shed light on the nature of that complexity for young Albertans who have been homeless and suggest that to address youth homelessness, cross-ministerial coordination that enhances opportunities to provide supports from multiple contact points, including health, education, and justice may be beneficial.

REFERENCES

1. Boivin, J-F., Roy, É., Haley, N., Galbaud Du Fort, G. (2005). The health of street youth: A Canadian perspective. *Canadian Journal of Public Health*, 96(6), 432-437.

2. Roy, É., Haley, N., Leclerc, P., Sochanski, B., Boudreau, J-F., Boivin, J-F. (2004). Mortality in a cohort of street youth in Montreal. *Journal of the American Medical Association*, 292(5), 569-574.

3. Frederick, T., Kirst, M., Erickson, P. (2012). Suicide attempts and suicidal ideation among street involved youth in Toronto. *Advances in Mental Health*, 11(1), 8-17.

4. Coates, J & McKenzie-Mohr, S. (2010). Out of the frying pan, into the fire: Trauma in the lives of homeless youth prior to and during homelessness. *Journal of Sociology & Social Welfare*, 37 (4), 65–96.

5. S. W. Brown, and L. A. Welsh. (1995). Physical abuse in Canadian runaway adolescents. *Child Abuse & Neglect*, 19 (4), 433-447.

6. Gaetz, S., Donaldson, J., Richter, T., Gulliver, T. (2013). *The State of Homelessness in Canada: 2013*. Toronto, Ontario: Canadian Homelessness Research Network Press. Retrieved from https://www.homelesshub.ca/SOHC2013

7. Canadian Institute for Health Information. (2006). *Head Injuries in Canada: A Decade of Change 1995-1995 to 2003-2004*. Ottawa, Ontario. Retrieved from https://secure.cihi.ca/free_products/ntr_head_injuries_2006_e.pdf

8. 7 Cities on Housing and Homelessness. (2015). *2014 Alberta Point-in-Time Homeless Count: Provincial Report*. Retrieved from https://docs.wixstatic.com/ugd/ff2744_82ee4dec83f24f60a821cee54bec8990.pdf

9. Edmonton Joint Planning Committee on Housing. (2006). *Out in the cold: A count of homeless persons in Edmonton*. Edmonton, Alberta. Retrieved from http://homewardtrust.ca//wp-content/uploads/2016/12/2006-Edmonton-Homeless-Count.pdf

10. Homeward Trust Edmonton. (2008). *A Count of Homeless Persons in Edmonton 2008*. Edmonton, Alberta. Retrieved from http://homewardtrust.ca//wp-content/uploads/2016/12/2008-Edmonton-Homeless-Count.pdf

11. Sorensen M. (2012). *Edmonton Homeless Count*. Edmonton, Alberta. Retrieved from https://www.edmonton.ca/programs_services/documents/PDF/2013-01-22-11-53FINAL__2012_Homeless_Count.pdf

12. World Health Organization. (2010). Homelessness. *International statistical classification of diseases and related health problems, tenth revision*. Retrieved from https://icd.who.int/browse10/2010/en#/Z59.0

13. World Health Organization. (2012). Lack of housing. *International statistical classification of diseases and related health problems, ninth revision, clinical modification*. Retrieved from http://www.icd9data.com/2014/Volume1/V01-V91/V60-V69/V60/V60.89.htm

APPENDIX A: DATA NOTES

This study used linked administrative data from the Child and Youth Data Lab (CYDL) Longitudinal Project, which combines data from six different ministries (Health, Community and Social Services, Children's Services, Education, Advanced Education, and Justice and Solicitor General) between the 2005/06 to 2010/11 fiscal years. Data from Alberta Health included the Alberta Health Care Insurance Plan registry and datasets that are submitted to Alberta Health with details on every hospital inpatient discharge, emergency room visits, outpatient clinic visit and physician office visit (physician claims). The hospital, emergency room and outpatient clinic data utilized here are also included in CIHI's Discharge Abstract Database and National Ambulatory Care Reporting System.

For this analysis, individuals were included if they were between the ages of 14 and 17 years in the 2005/06 fiscal year and registered in the Alberta Health Care Insurance Plan (AHCIP) during the entire study period (2005/06 to 2010/11). The AHCIP covers all residents of Alberta with the exception of refugees and individuals who may be living in Alberta but are residents of another province or country, such as university students. The AHCIP contains the vast majority of children and youth living in Alberta. A cohort design was used to describe the risk factors for and outcomes of Alberta youth who experience visible homelessness. All variables used in the analysis were derived from the CYDL administrative data.

Corrections
Corrections were defined as individuals who received a provincial custodial or community correctional sentence. Young adults with corrections involvement have appeared before the Court or a Justice of the Peace for an offence charge and have been remanded in custody or placed under pre-trial supervision in the community awaiting further court dates, or have been found guilty and sentenced to a community disposition (i.e. Fine, Probation, Community Service Work, Deferred Custody) and/or custody (in which the sentence is served in a custodial facility).

Charged with an offence
Charged with an offence was defined as an offence from any federal and/or provincial statute. Individuals with criminals offences included those (aged 12 or older) charged with offences under various federal statues. Individuals charged with multiple offences may have had multiple offences in a single incident, or they may have been charged in multiple incidents.

Income Support (IS)
Income Support is a government program that provides financial assistance to individuals (aged 16 and older) who are unable to meet their basic needs.

Special Education
Receipt of special education was determined by whether the youth was assigned a special education code for special education programming services as a student or child (aged 2.5 to 19 years) in Alberta Education's administrative data.

Number of Moves (Residential Moves)
The number of moves was determined by the number of unique postal codes within the Alberta Health Care Insurance Plan registry during the study period. Please note that health care premiums ceased to be collected on January 1st, 2009; addresses in registry have been updated less often since that time, reducing their accuracy.

Variables Utilizing Health Diagnostic Codes (Mental Health, Substance Use, Alcohol Dependence, Visible Homelessness)

When an individual receives medical care in a hospital, clinic, emergency room or physician office visit, a code is attached to the record that indicates what diagnoses the physician gave or suspects in a particular encounter. These codes (called International Classification of Disease, 9th Revision [ICD-9] and International Classification of Disease, 10th Revision [ICD-10]) are based on the World Health Organization, are standard across Canada and are comprehensive. While there are strengths and limitations, it is common for researchers to utilize these codes to determine what conditions individuals in a research study might have. This study utilized diagnostic codes to create indicators of pregnancy, delivery, visible homelessness, and other health-related variables. Table 3 lists the ICD-9 and ICD-10 codes utilized to define each condition. Indicators of trauma and abuse were based on the Canadian Institute for Health Information definitions.[7]

While receiving a diagnostic code for a particular condition suggests that the individual may have that condition, it is not guaranteed as individuals can receive various potential diagnoses until the true condition is determined. A diagnostic code also does not indicate a visible or distinct diagnostic event. Diagnosis codes are only reported when an individual seeks medical attention – it is likely that there are many individuals who have a particular condition who have not sought medical attention during the time period, or were diagnosed prior to the start of the study period. This is especially true for mental health conditions, substance use, alcohol dependence, and visible homelessness. Despite these limitations, administrative health data is a highly useful source of information to compare trends in health care and service utilization between different groups.

Visible Homelessness

Indicators of visible homelessness are especially challenging using administrative data, as (1) approximately 10-20% of homeless youth are likely identified using this method (see validation study below); (2) only homeless youth who sought medical attention are captured; and (3) it is likely the case that youth who are visibly homeless or have conditions stereotypically associated with homelessness are more likely to be represented. For instance, a medical team maybe more likely to use the homelessness diagnostic code if there was some reason for them to inquire or about, or suspect homelessness. Therefore the youth identified here as homeless may be more marginalized than the general population of homeless youth, and it is less likely that couch surfers or other less visibly homeless youth would be captured. For this reason, the indicator developed here is referred to as diagnostic codes for visible homelessness.

It is also important to note that because administrative data are being used to assess visible homelessness, it is impossible to know when youth actually became homeless. For example, a young person could have been homeless for several years prior to receiving medical attention that resulted in a diagnostic code for visible homelessness. Homeless youth not identified with a diagnostic code would be considered housed for this analysis. However, given that there were 760 youth identified as homeless in the 7 Cities street count, and there were over 174,000 youth included as part of this study, this would not appreciably affect the resulting estimates for the housed population.

Table 3. ICD-9 and ICD-10 Codes Utilized

	ICD-9 Codes Utilized (Physician Claims Dataset)	ICD-10 Codes Utilized (Hospital Inpatient Stays, Outpatient Clinics, and Emergency Room Visits)
Pregnancy	• 630-639 Pregnancy with abortive outcome • 650-659 Normal delivery, and other indications for care in pregnancy, labour and delivery • 660-669 Complications occurring mainly in the course of labour and delivery • V22-V24, V27-V28 Persons encounter health services in circumstances related to reproduction and development • V30-V39 Healthy liveborn infants according to type of birth • V81 Persons without reported diagnosis encountered during examination and investigation of individuals and populations	• O03 Spontaneous abortion • O04 Complications following (induced) termination of pregnancy • O05 Other abortion • O6 Complications of labor and delivery • O32 Maternal care for malpresentation of fetus • Z33 Pregnant State • Z34 Encounter for supervision of normal pregnancy • Z35 Supervision of high-risk pregnancy • Z36 Encounter for antenatal screening of mother • Z37 Outcome of delivery • Z38 Liveborn infants according to place of birth and type of delivery
Delivery	• 650-659 Normal delivery, and other indications for care in pregnancy, labour and delivery • 660-669 Complications occurring mainly in the course of labour and delivery	• O6 Complications of labor and delivery • Z37 Outcome of delivery • Z38 Liveborn infants according to place of birth and type of delivery
Substance Use	• 291 Alcoholic psychoses • 292 Drug psychoses • 303 Alcohol dependence syndrome • 304 Drug dependence • 305 Nondependent abuse of drugs	• X40-49 Accidental poisoning by and exposure to noxious substances • T36-T50 Poisoning by drugs and biological substances • F10-F19 Mental, behavioural, and neurodevelopment disorders due to substance use • F55 Abuse of non-dependence-producing substances • Z50.2 Alcohol rehabilitation • Z50.3 Drug rehabilitation
Alcohol use	• 291 Alcoholic psychoses • 303 Alcohol dependence syndrome • 305 Nondependent abuse of drugs	• F10 Mental and behavioural disorders due to use of alcohol • G31.2 Degeneration of nervous system due to alcohol
Homelessness	• V60.0 Lack of housing	• Z59.0 Homelessness
Schizphrenia	• 295 Schizophrenic psychoses	• F20 Schizophrenia • F21 Schizotypal disorder • F23.2 Acute schizophrenia-like psychotic disorder • F25 Schizoaffective disorders

Table 3.   ICD-9 and ICD-10 Codes Utilized (Cont'd)

	ICD-9 Codes Utilized (Physician Claims Dataset)	ICD-10 Codes Utilized (Hospital Inpatient Stays, Outpatient Clinics, and Emergency Room Visits)
Personality Disorder	• 301 Personality disorders	• F34.0 Cyclothymia • F60 Specific personality disorders • F61 Mixed and other personality disorders • F62 Enduring personality changes, not attributable to brain damage and disease • F68.1 Intentional production or feigning of symptoms or disabilities • F68.8 Other specified disorders of adult personality and behaviour • F69 Unspecified disorder of adult personality and behavior
ADHD	• 314 Hyperkinetic syndrome of childhood	• F90 Attention-deficit hyperactivity disorders
Adjustment	• 309 Adjustment reaction	• F43 Reaction to severe stress, and adjustment disorders
Bipolar	• 296 Affective psychoses	• F30 Manic episode • F31 Bipolar disorder
Conduct	• 312 Disturbance of conduct not elsewhere classified	• F91 (expect F91.3) Conduct disorders
Anxiety	• 300.0 Anxiety states • 300.2 Phobic state • 300.3 Obsessive-compulsive disorders	• F40 Phobic anxiety disorders • F41 Anxiety disorders • F42 Obsessive-compulsive disorder
Depression	• 296.1-296.8 Affective psychoses • 300.4 Neurotic depression • 311 Depressive disorder, not elsewhere classified	• F32 Major depressive disorder, single episode • F33 Recurrent depressive disorder • F34.1 Dysthymia • F38.0 Other single mood [affective] disorders • F38.1 Other recurrent mood [affective] disorders • F41.2 Mixed anxiety and depressive disorder • F53.0 Mild mental and behavioural disorders associated with the puerperium, not elsewhere classified • F93 Emotional disorders with onset specific to childhood
Self-Harm		• T39-T43, T50.9 Poisoning by drugs, medicaments and biological substances • T58 Toxic effect of carbon monoxide • X40-X47 Accidental poisoning by and exposure to noxious substances • X60-X84 Intentional self-harm • Y10, Y11, Y12, Y16, Y17 Poisoning by and exposure to noxious substances, undetermined intent • T39 Poisoning by nonopioid analgesics, antipyretics and antirheumatics • T40 Poisoning by narcotics and psychodysleptics [hallucinogens] • T42.1, T42.3, T42.7 Poisoning by antiepileptic, sedative-hypnotic and antiparkinsonism drugs • T43 Poisoning by psychotropic drugs, not elsewhere classified

Table 3.   ICD-9 and ICD-10 Codes Utilized (Cont'd)

	ICD-9 Codes Utilized (Physician Claims Dataset)	ICD-10 Codes Utilized (Hospital Inpatient Stays, Outpatient Clinics, and Emergency Room Visits)
Trauma **Indicator of trauma was based on the CIHI's case definition** **Canadian Institute for Health Information. Head Injuries in Canada: A Decade of Change (1995-1995 to 2003-2004).; 2006.**		• W00-W19 External causes of morbidity and mortality due to falls • W20-W45 Exposure to inanimate mechanical forces • W49 Exposure to other and unspecified inanimate mechanical forces • W50-W60 Exposure to animate mechanical forces • W64 Exposure to other and unspecified animate mechanical forces • W65-W70 Accidental drowning and submersion • W73-W74 Other specified and unspecified drowning and submersion • W75-W84 Other accidental threats to breathing • W85 -W99 Exposure to electric current, radiation and extreme ambient air temperature and pressure • X00-X09 Exposure to smoke, fire and flames • X10 Contact with hot drinks, food, fats and cooking oils • X30-X39 Exposure to forces of nature • X50 Overexertion and strenuous or repetitive movements • X52 Prolonged stay in weightless environment • X58 Exposure to other specified factors • X59 Exposure to unspecified factor • V01-V99 External causes of morbidity and mortality by transport accidents • Y20-Y29 Event of undetermined intent • Y35 Legal intervention • Y36 Operations of war
Traumatic Brain Injury **Indicator was based on the Injury Prevention Centre's case definition** **Injury Prevention Centre. Traumatic Brain Injuries in Alberta, Hospital Admissions (2005-2014)/Emergency Department Visits (2011-2014). Edmonton, Alberta; 2017.**		• S02.0, S02.1, S02.7, S02.9 Fracture of skull and facial bones • S06.1-S06.9 Intracranial injury • S07.1, S07.8, S07.9 Crushing injuries and traumatic amputations of specified and multiple body regions • T02.00, T02.01 Factures involving multiple body regions

Table 3.   ICD-9 and ICD-10 Codes Utilized (Cont'd)

	ICD-9 Codes Utilized (Physician Claims Dataset)	ICD-10 Codes Utilized (Hospital Inpatient Stays, Outpatient Clinics, and Emergency Room Visits)
Assault		• X85-X89 Assault by drugs, corrosive substance, pesticides, gases and vapours, other specified and unspecified chemicals or noxious substances • X90-95 Assault by hanging, strangulation, suffocation, drowning and submersion, handgun, rifle, shotgun or unspecified firearm • X96-99 Assault by explosive material, smoke, fire and flames, steam, hot vapours, hot objects, sharp objects • Y00-Y04 Assault by blunt object, pushing from a high place, pushing or placing victim before moving object, crashing of a moter vehicle, bodily force • Y08-09 Assault by other specified or unspecified means
Sexual Assault	• V71.5 Observation following alleged rape or seduction	• Y05 Sexual assault by bodily force • T74.2 Sexual abuse
Abuse	• 995.5 Child maltreatment syndrome	• Y05 Sexual assault by bodily force • Y06 Neglect and abandonment • Y07 Other maltreatment syndromes • T74 Adult and child abuse, neglect and other maltreatment, confirmed • Z04.5 Examination and observation following other inflicted injury
Frost-bite or hypothermia	• 991 Effects of reduced temperature	• T33 Superficial frostbite • T34 Frostbite with tissue necrosis • T35 Frostbite involving multiple body regions and unspecified frostbite • T68 Hypothermia • T69 Other effects of reduced temperature

Determining the Validity of the Visible Homelessness Variable

The visible homelessness variable described above was compared to the 7 Cities report[8] on homelessness from 2014. This report was used because it has representation from across the province, and shows counts for homelessness broken down by gender and age. Tables 4 and 5 compare the 7 cities data to the CYDL data. While the 24-35-year age category goes beyond the CYDL data age range, the proportions are similar by geography and age group. When the CYDL data were broken down by year, it was clear that the health data severely underreported the total number of homeless persons in Alberta (some cells suppressed due to small numbers) (Table 6). For example, the number of youth flagged as homeless by the healthcare system in Edmonton ranged between 39 individuals in 2005/06 and 146 individuals in 2010/2011, while the Edmonton Street Count reported 678 youth aged 17-30 in 2006[9] and 574 youth aged 17-30 in 2008[10]. Thus the data from the healthcare system are 10 times smaller for 2006 and 5 times smaller for 2008.[d]

Table 7 describes the proportion of females in the 7 Cities data (all ages) and the CYDL data (ages 12-30). There are statistically significantly more females in the CYDL data than what would be expected from the homeless count: 26% (95% CI: 24-28%) vs 42% (95% CI: 38-45%). More females could appear in the CYDL data for three reasons: 1) couch surfing was not included in the definition of visible homelessness in the 7 cities report, while the ICD-9-CA and ICD-10-CA codes could be seen to include couch surfing "lack of housing,"[12] "persons lacking permanent or reliable shelter, variously due to poverty, lack of affordable housing, mental illness, substance abuse, juvenile alienation, or other factors,"[13] and females are more likely to couch surf than sleep rough; 2) women (in general) are more likely to have contact with the healthcare system so there may be more opportunity for them to be recorded as homeless. However, a more likely explanation is the different age distributions – when the Edmonton Homeless Count data for the same year was pulled (Table 8)[11], the proportion of youth who were female was 37% - much more similar to the CYDL data than then 7 Cities data. Calgary, Wood Buffalo, and Red Deer did not break gender down by age, and the other centres have sample sizes that are too small to compare.

Conclusion: While the homeless variable in the CYDL data does not appear to be biased by geography and age, it is a severe underestimate of the true number of individuals who experienced visible homelessness in a given year. Given that it is likely capturing 10-20% of the total population of street youth, it should be used cautiously. Youth with this flag would be those that received medical attention and the medical team had reason to inquire about or suspect homelessness, therefore they are likely more visibly homeless and may be more marginalized than the overall population of homeless youth in Alberta.

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[d] There is a strong time trend in Edmonton homeless count data with homeless persons (all ages) increasing dramatically starting in 2000 and then falling to approx. 2002 levels in 2012 (2000= 1,160, 2006=2,192, 2008=3,079, 2010=2,421, 2012=2,174).

Table 4. 7 Cities 2014 Data: Homeless individuals by age group and municipality surveyed in

Age Group	Medicine Hat		Grande Prairie		Red Deer		Lethbridge		Wood Buffalo		Calgary		Edmonton		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
12 to 18	1	9%	8	22%	6	13%	6	18%	4	6%	0	0%	26	6%	51	7%
18 to 21	0	0%	6	16%	3	7%	5	15%	0	0%	10	8%	111	25%	135	18%
21 to 24	1	9%	5	14%	6	13%	4	12%	0	0%	15	12%	95	21%	126	17%
24 to 35	9	82%	18	49%	30	67%	19	56%	59	94%	97	80%	217	48%	449	59%
Total	11		37		45		34		63		122		449		761	
% of Grand Total (n/761)	1%		5%		6%		4%		8%		16%		59%		100%	

Table 5. CYDL Data (2005/06-2010/11): Proportion of individuals who received a visibly homeless diagnostic code, by age group and municipality of residence

Age Group	Medicine Hat		Grande Prairie		Red Deer		Lethbridge		Wood Buffalo		Calgary		Edmonton		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
12 to 18	supressed	supressed	3	7%	supressed	supressed	11	7%	32	7%	49	6%	26	6%	51	7%
18 to 21	supressed	supressed	5	11%	supressed	supressed	12	7%	66	15%	96	13%	111	25%	135	18%
21 to 24	supressed	supressed	9	supressed	supressed	supressed	41	24%	97	22%	172	23%	111	23%	126	22%
24 to 30	19	53%	11	55%	28	62%	13	68%	97	68%	105	62%	255	57%	443	58%
Total	36		20		45		21		169		169		450		760	
% of Grand Total (n/761)	5%		3%		6%		3%		22%		22%		59%		100%	

Table 6. CYDL Data (2005/06-2010/11): Individuals who have received a visibly homeless diagnostic code, by municipality of residence and fiscal year

Fiscal Year	Medicine Hat	Grande Prairie	Red Deer	Lethbridge	Wood Buffalo	Calgary		Edmonton		Rest of Alberta	
						n	%	n	%	n	%
2005/06						13	12%	39	36%	44	41%
2006/07						30	17%	66	37%	60	34%
2007/08			suppressed			41	20%	84	40%	61	29%
2008/09						38	17%	104	46%	58	25%
2009/10						42	16%	114	43%	72	27%
2010/11						35	11%	146	46%	94	30%

Table 7. Comparison of the proportion of homeless individuals identified as female in 7 Cities Data and CYDL administrative data

	7 Cities (All Ages)				CYDL Data (Age 12-30			
	% Female	Total N	Lower CI	Upper CI	% Female	Total N	Lower CI	Upper CI
Medicine Hat	38%	29	20%	56%	50%	36	34%	66%
Grande Prairie	30%	110	21%	38%	43%	20	21%	65%
Red Deer	25%	99	17%	34%	38%	45	24%	52%
Lethbridge	41%	128	32%	49%	29%	21	9%	48%
Wood Buffalo	26%	293	21%	30%	58%	19	36%	80%
Calgary	20%	431	16%	23%	39%	169	32%	46%
Edmonton	27%	1454	25%	29%	41%	450	37%	46%
Total	26%	2495	24%	28%	42%	760	38%	45%

Table 8. Proportion of individuals identified as female in the Edmonton Homeless Count 2012

	Total N	N Female	% Female
14-17	56	23	41%
18-24	202	77	38%
25-30	217	75	35%
total	475	175	37%

THE CHILD AND YOUTH DATA LABORATORY

The **Child and Youth Data Laboratory**'s (CYDL's) Longitudinal Project (Experiences of Albertan Children and Youth over Time, 2005/06 to 2009/10/11) is a joint initiative between PolicyWise for Children & Families and participating ministries in the Government of Alberta. The mandate of the CYDL is to link and analyze administrative data from Government ministries, to provide evidence for policy and program development.

The CYDL is managed by **PolicyWise for Children & Families**. PolicyWise is a not-for-profit organization whose mission is to develop and integrate evidence to inform, identify and promote effective public policy and service delivery to improve the well-being of children, families and communities in Alberta, Canada and internationally.

THIS PROJECT
The CYDL Longitudinal Project focuses on understanding the experiences of Albertan children and youth as they develop. The focus is service use within and across ministries, as it is related to key indicators and to the passage of time. Studying experiences over several years of development adds a valuable level of richness to an already ground-breaking initiative, providing detailed insight into the factors that help to shape our children and youth as they develop.

SUGGESTED CITATION
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Children's Services	**Community and Social Services**
Advanced Education	**Health**
Justice and Solicitor General	**Education**
Indigenous Relations	

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This study is based in part on data provided by the Government of Alberta. The interpretation and conclusions contained herein are those of the researchers and do not necessarily represent the views of the Government of Alberta. The Government of Alberta does not express any opinion in relation to this study.