

Appendix Table 1. Variable checklist for each database

Database	Variables	Location	Definition
National Ambulatory Care Reporting System (NACRS) ^{1,2} - Patient Level	Number of patients	Table 1, Table 2, Table 3, Table 4, Table 5, Appendix Table 5, Appendix Table 6	Count of patients
	Number of ED visits per patient	Table 1, Table 2, Table 3, Appendix Table 5, Appendix Table 6	Count of ED visits individually
	Sex	Table 3, Table 4, Table 5, Appendix Table 5, Appendix Table 6	Original data
	Age	Table 3, Appendix Table 5, Appendix Table 6	Original data
	Rural/urban	Table 3, Table 4, Table 5, Appendix Table 5, Appendix Table 6	Derived from the truncated postal code. Rural residence had “0” in the second position of the truncated postal code.
	Number of discharge diagnosis mental illness chapters	Appendix Table 5, Appendix Table 6	Count of the ICD-10-CA ED diagnoses pertaining to mental health issues
	Number of discharge diagnosis circulatory chapters	Appendix Table 5, Appendix Table 6	Count of the ICD-10-CA ED diagnoses pertaining circulatory issues
	Number of discharge diagnosis respiratory chapters	Appendix Table 5, Appendix Table 6	Count of the ICD-10-CA ED diagnoses pertaining to respiratory issues
	Number of discharge diagnosis digestive chapters	Appendix Table 5, Appendix Table 6	Count of the ICD-10-CA ED diagnoses pertaining to digestive issues
	Charlson Comorbidity Index	Table 4, Table 5, Appendix Table 5, Appendix Table 6	Derived from primary ED diagnosis. This index combines patients’ status on 17 medical comorbidities into a score with

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			predictive validity for mortality.
	Number of discharge diagnosis chapters	Table 4, Table 5, Appendix Table 5, Appendix Table 6	Count of the distinct ICD-10-CA ED diagnosis chapters
	Number of months in the year that patients visited ED	Table 4, Table 5, Appendix Table 5, Appendix Table 6	Count of the months in the year that patients visited ED
	Regularity index	Table 4, Table 5, Appendix Table 5, Appendix Table 6	Calculated an ED visit regularity index to characterize spacing between patients' visits over the 365-day pre-index-visit period using the following equation: $1/1+\text{variance of visits}$
National Ambulatory Care Reporting System (NACRS) ^{1,2} -Visit Level	Number of ED visits	Table 1, Table 2, Table 3, Table 4, Table 5, Appendix Table 5, Appendix Table 6	Count of ED visits
	Arrive by ambulance	Table 1, Table 2, Table 3	Original data
	Triage level	Table 1, Table 2, Table 3	Original data
	Top 5 ICD-10-CA ED diagnosis chapters	Table 1, Table 2, Appendix Table 5, Appendix Table 6	Classified primary ED diagnosis into ICD-10-CA diagnosis chapter and selected top 5.
	Top 5 ICD-10-CA ED primary diagnosis	Table 4, Table 5, Appendix Table 5, Appendix Table 6	Top 5 primary ED diagnosis with ICD-10-CA code
	Visit disposition	Table 1, Table 2, Table 3, Table 4, Table 5, Appendix Table 5, Appendix Table 6	Original data
Hospitalization Characteristics (DAD) ³	Number of patients	Table 3, Table 4, Table 5, Appendix Table 5, Appendix Table 6	Count of patients

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	Number of admissions	Table 1, Table 2, Appendix Table 5, Appendix Table 6	Count of admissions
	Number of admissions per patient	Table 1, Table 2, Appendix Table 5, Appendix Table 6	Count of admissions individually
	Median time admitted (days)	Appendix Table 5, Appendix Table 6	Original data: the total number of days the patient was hospitalized.
	Top 5 ICD-10 diagnosis chapters 1 simplified	Table 1, Table 2, Table 4, Table 5, Appendix Table 5, Appendix Table 6	Classified the most responsible diagnosis for the patient during hospitalization into ICD-10-CA diagnosis chapter and selected top 5.
	ICD-10 main problem chapter	Table 3	responsible diagnosis for the patient during hospitalization into ICD-10-CA diagnosis chapter
	Alcohol-related diagnosis	Table 3, Table 4, Table 5, Appendix Table 5, Appendix Table 6	Identified from the most responsible diagnosis for the patient during hospitalization based on standard in supplementary Table 1.
Mental Health Hospitalization Characteristics (HMHDB) ⁴	Number of patients	Table 3, Table 4, Table 5, Appendix Table 5, Appendix Table 6	Count of patients
	Number of mental health admissions	Table 1, Table 2, Appendix Table 5, Appendix Table 6	Count of mental health admissions
	Data source	Appendix Table 5, Appendix Table 6	Original data: indicates the original data source for the record
	Homelessness	Table 3, Appendix Table 5, Appendix Table 6	Original data: indicates whether a person was homeless on admission

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	Age	Appendix Table 5, Appendix Table 6	Original data
	Number of mental health admissions per patient	Table1, Table 2, Appendix Table 5, Appendix Table 6	Count of mental health admissions individually
	Involuntary admissions	Appendix Table 5, Appendix Table 6	Original data: indicates the legal status of the patient upon admission to hospital
	Length of stay at hospital (days)	Appendix Table 5, Appendix Table 6	Original data: the total number of days the person was hospitalized.
	Diagnosis category	Table1, Table 2, Table 3, Table 4, Table 5, Appendix Table 5, Appendix Table 6	Original data
	Discharge disposition	Appendix Table 5, Appendix Table 6	Original data: broad mental health category based on the most responsible separation diagnosis code
Continuing Care Reporting System (CCRS) ⁵	Number of patients	Table 3	Count of patients
Home Care Reporting System (HCRS) ⁶	Number of patients	Table 3	Count of patients

Footnote: Emergency department (ED), International Statistical Classification of Diseases and Related Health Problems (ICD-10-CA).

1. Canadian Institute for Health Information. National Ambulatory Care Reporting System Metadata (NACRS). Ottawa, ON. Available from: www.cihi.ca/en/national-ambulatory-care-reporting-system-metadata-nacrs.

2. Canadian Institute for Health Information. Data Quality Documentation, National Ambulatory Care Reporting System Ottawa, ON. Available from: www.cihi.ca/sites/default/files/document/nacrs-data-quality-current-year-information-2019-2020-en.pdf

3. Canadian Institute for Health Information. Discharge Abstract Database Metadata (DAD). Ottawa, ON. Available from: www.cihi.ca/en/discharge-abstract-database-metadata-dad

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4. Canadian Institute for Health Information. Hospital Mental Health Database Metadata (HMHDB). Ottawa, ON. Available from: www.cihi.ca/en/hospital-mental-health-database-metadata-hmhdb

5. Canadian Institute for Health Information. Continuing Care Metadata. Ottawa, ON. Available from: www.cihi.ca/en/continuing-care-metadata

6. Canadian Institute for Health Information. Home Care Reporting System Metadata. Ottawa, ON. Available from: www.cihi.ca/en/home-care-reporting-system-metadata

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Appendix Table 2. ICD-10-CA Alcohol-related Diagnostic Codes

ICD-10-CA Code	Description
E244	Alcohol-induced pseudo-Cushing's syndrome
E52	Niacin deficiency [pellagra]
F10.-	Mental and behavioural disorders due to use of alcohol
F100	Mental and behavioural disorders due to use of alcohol, acute intoxication
F101	Mental and behavioural disorders due to use of alcohol, harmful use
F102	Mental and behavioural disorders due to use of alcohol, dependence syndrome
F103	Mental and behavioural disorders due to use of alcohol, withdrawal state
F104	Mental and behavioural disorders due to use of alcohol, withdrawal state with delirium
F105	Mental and behavioural disorders due to use of alcohol, psychotic disorder
F106	Mental and behavioural disorders due to use of alcohol, amnesic syndrome
F107	Mental and behavioural disorders due to use of alcohol, residual and late-onset psychotic disorder
F108	Mental and behavioural disorders due to use of alcohol, other mental and behavioural disorders
F109	Mental and behavioural disorders due to use of alcohol, unspecified mental and behavioural disorder
G312	Degeneration of nervous system due to alcohol
G621	Alcoholic polyneuropathy
G721	Alcoholic myopathy
I426	Alcoholic cardiomyopathy
K292	Alcoholic gastritis
K70.-	Alcoholic liver disease
K700	Alcoholic fatty liver
K701	Alcoholic hepatitis
K702	Alcoholic fibrosis and sclerosis of liver
K703	Alcoholic cirrhosis of liver
K704	Alcoholic hepatic failure
K709	Alcoholic liver disease, unspecified
K852	Alcohol-induced acute pancreatitis
K860	Alcohol-induced chronic pancreatitis
O354	Maternal care for (suspected) damage to fetus from alcohol
R780	Finding of alcohol in blood
T510	Toxic effects of alcohol, Ethanol
X65	Intentional self-poisoning by and exposure to alcohol
Y15	Poisoning by and exposure to alcohol, undetermined intent
Y90	Evidence of alcohol involvement determined by blood alcohol level
Y91	Evidence of alcohol involvement determined by level of intoxication
Z040	Blood-alcohol and blood-drug test
Z714	Alcohol abuse counselling and surveillance

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Z721	Alcohol use
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Footnote: International Statistical Classification of Diseases and Related Health Problems (ICD-10-CA).

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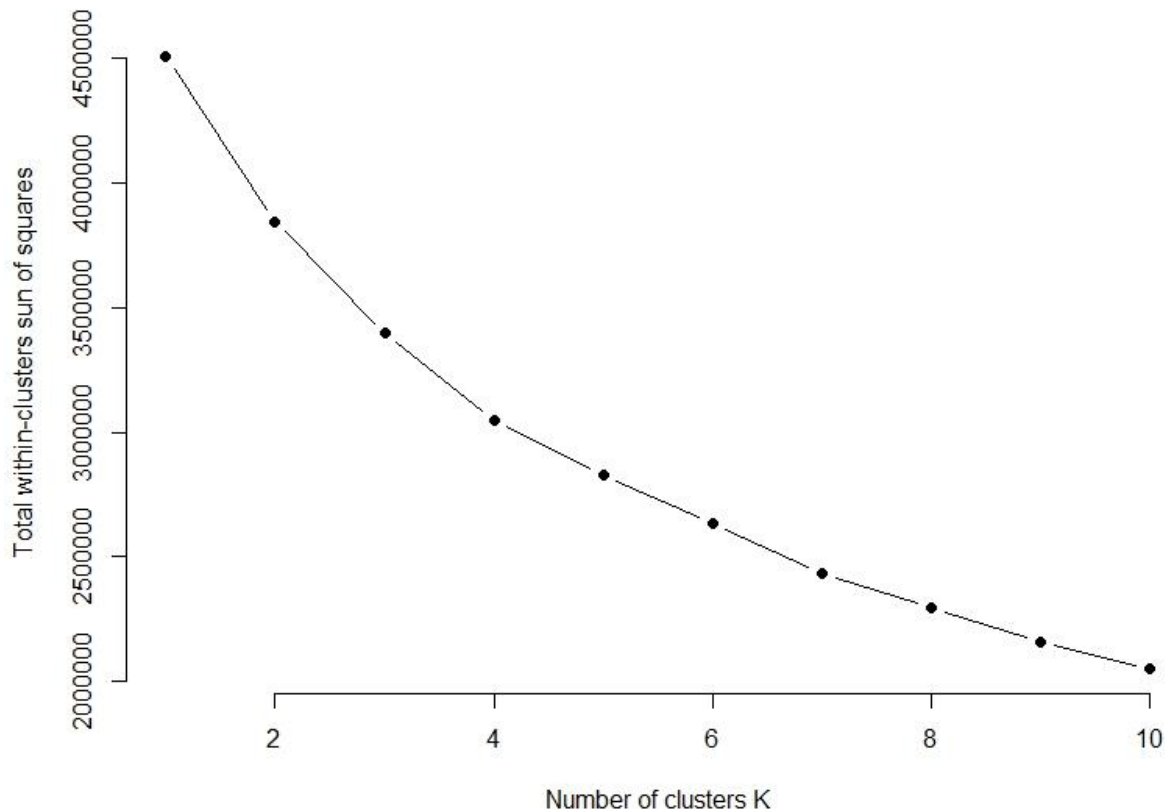
Appendix Table 3. Pseudo-F Values Associated with Cluster Number Among People Who Make Frequent ED Visits in Ontario.

Clusters	1	2	3	4	5	6	7	8	9	10
W	4509810	3846495	3396256	3048085	2828354	2631140	2435573	2292006	2155767	2050494
Pseudo F	Inf	77769.91	73932.8	72089.6	67026.4	64400.5	64011.5	62339.1	61556.3	60098.3
			4		2	9	4	4	8	9

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Appendix Figure 1: Elbow Plot Associated with Cluster Number Among People Who Make Frequent ED Visits in Ontario.

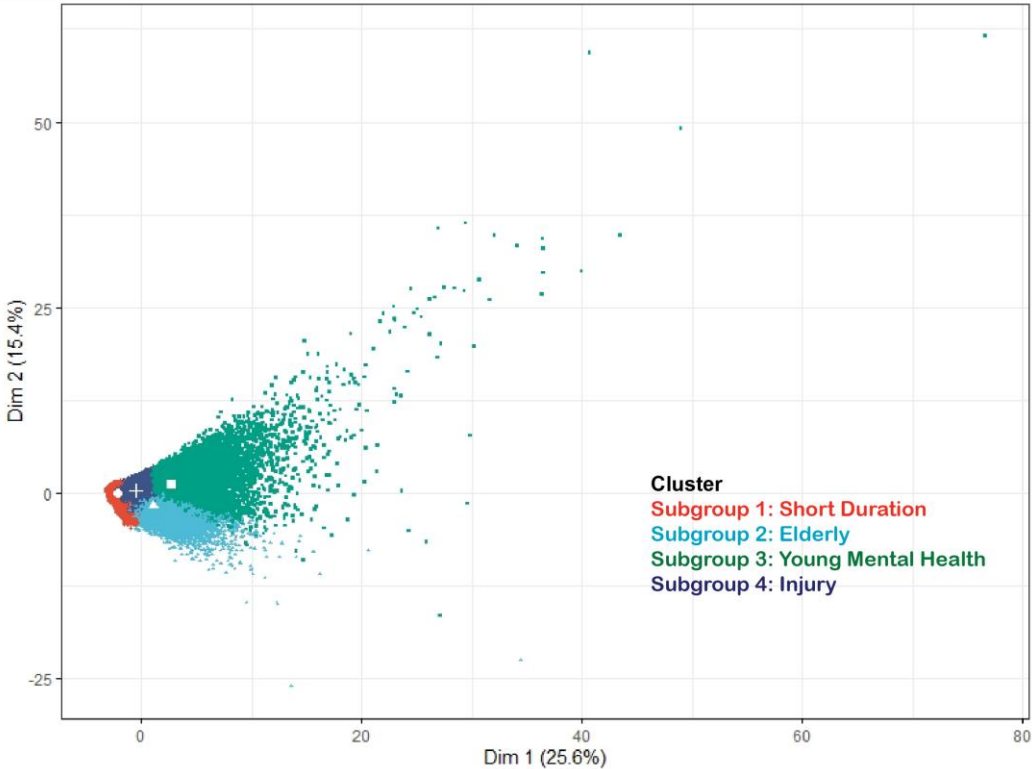


Footnote: We chose four subgroups based on optimization of the pseudo-F statistic value, which compares between-cluster to within-cluster sum-of-squares, a visible kink in the elbow plot (seen at both two and four subgroups), and real-world meaningfulness of generated subgroups. This is an accepted approach in the literature. We used the pseudo-F test and elbow plot as a guide. However, it is well-accepted in cluster analysis to include analyst input in addition to statistical testing to interpret meaningful groups. We considered our previous analysis of British Columbia data, which identified four clinically meaningful subgroups. When we ran our cluster algorithm using the current Ontario and Alberta data, we obtained clinically sensible groupings that were similar to our British Columbia analysis when we specified four subgroups. This produced a more descriptive output than organizing our data into two groupings. We also ran our clustering algorithm specifying five subgroups, and while gaining marginally in the pseudo-F value, organizing our data into five subgroups did not add anything meaningful or actionable from a clinical perspective.

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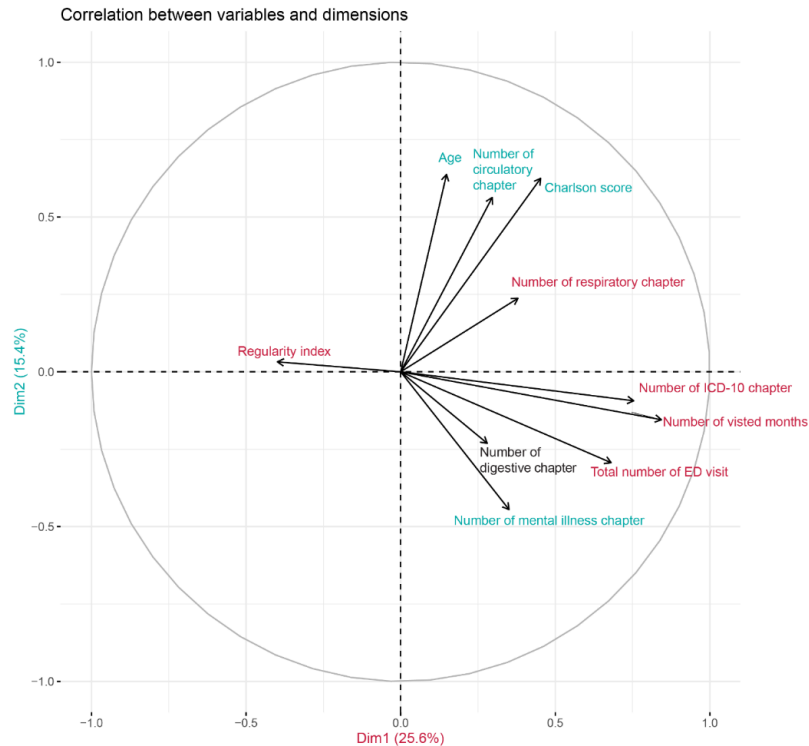
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Appendix Figure 2: Graphical Representation of Subgroups of People Who Make Frequent ED Visits in Ontario.



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Footnote: white markers indicated the cluster mean for each group.

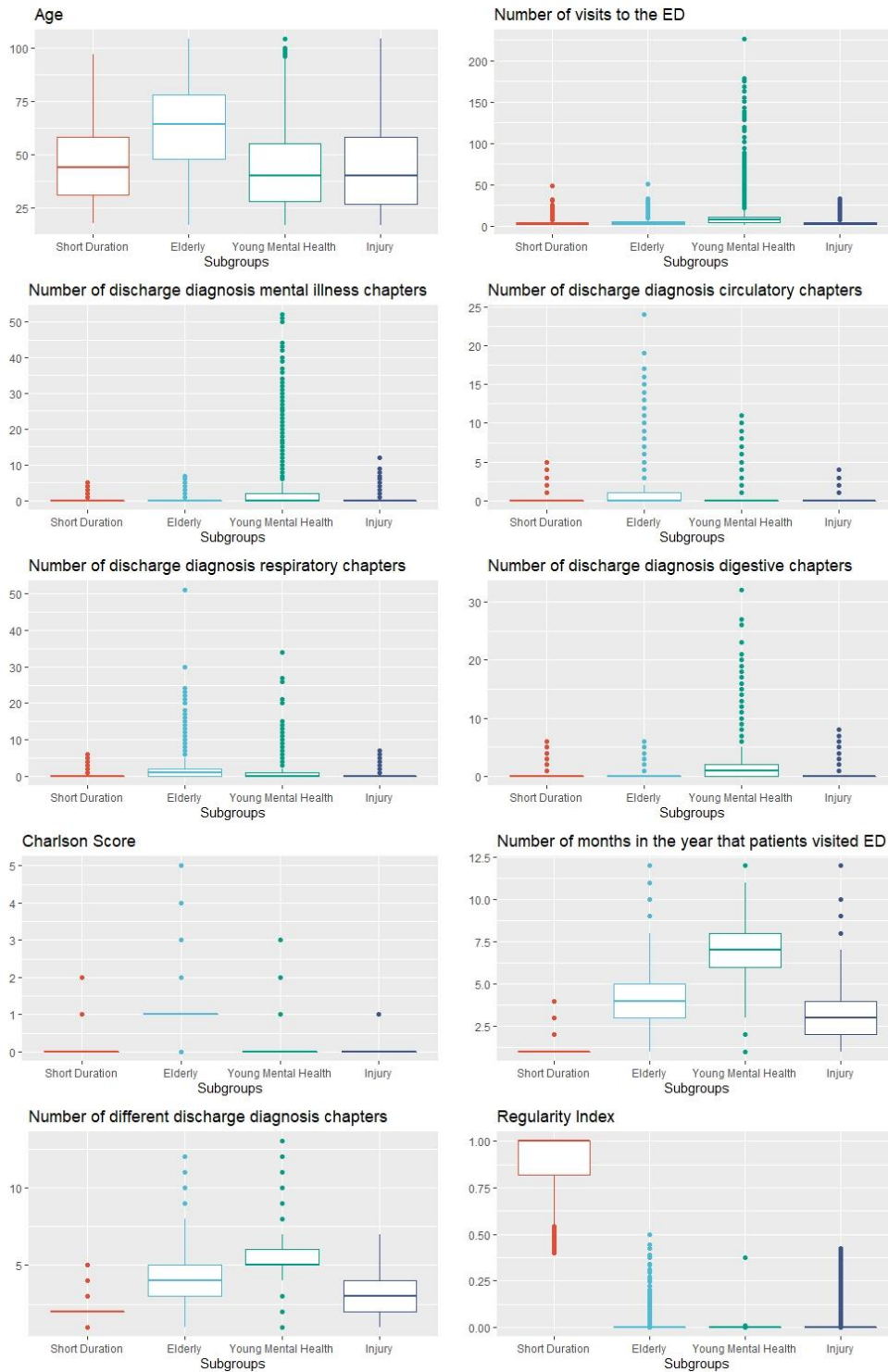
We were interested in a graphical representation of our subgroups, but doing so requires a reduction of the dimensionality of the data so that it can be represented on a graph. One approach to this is to apply a principal components-type analysis after clustering, and then plotting the most important variables vs. the second most important (these are Dim1 and Dim2). Supplementary Figure 2 showed clusters of samples based on their similarity. Dimension 1 accounted for 25.6% of the information. Dimension 2 accounted for 15.4% of the information. The variation for Subgroups 2 and 3 was higher than for Subgroups 1 and 4.

The plot above suggests that number of ICD-10-CA ED discharge diagnoses pertaining to respiratory, number of distinct ICD-10-CA diagnostic chapters, number of months that the patient visited an ED, and ED visit number had strong positive effect on Dimension 1. Regularity index had a strong negative effect on Dimension 1. Age at index, Charlson comorbidity score, and number of ICD-10-CA ED discharge diagnoses pertaining to circulatory concerns had a strong positive effect on Dimension 2. Number of ICD-10-CA ED discharge diagnoses pertaining to mental health had a strong negative effect on Dimension 2.

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Appendix Figure 3: Distribution Among Clustering Variables for People Who Make Frequent ED Visits in Ontario



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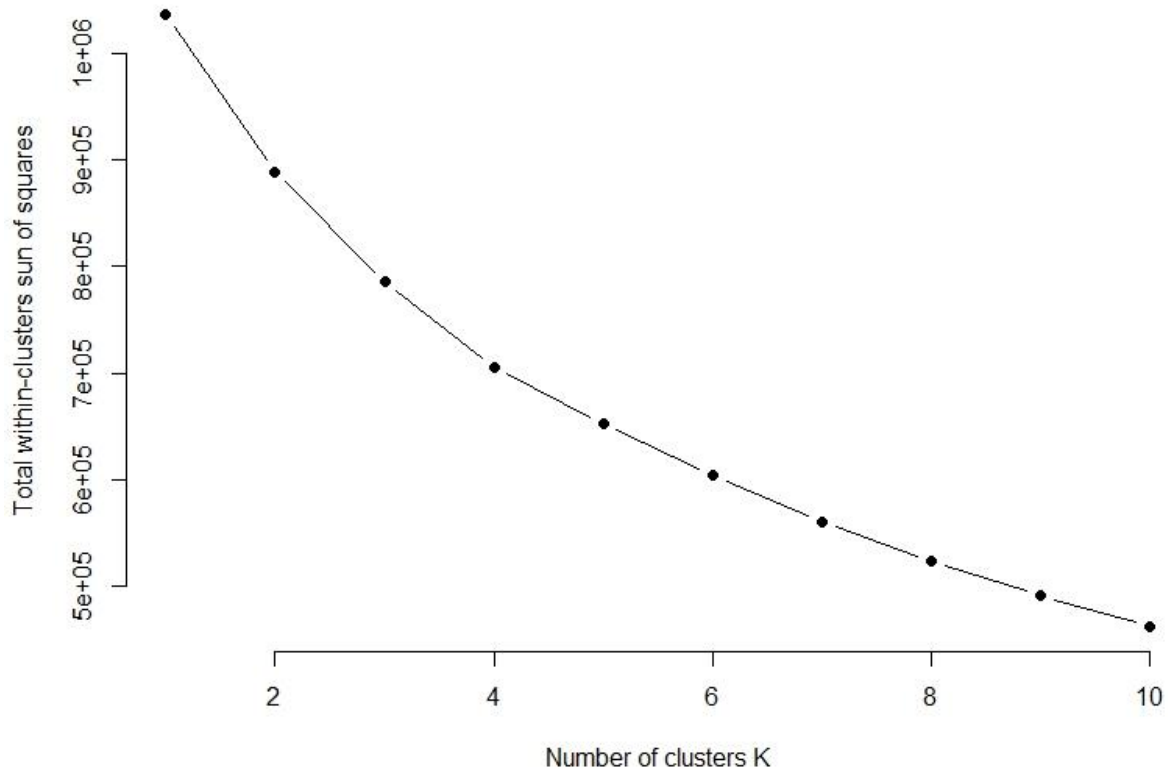
Appendix Table 4. Pseudo-F Values Associated with Cluster Number Among People Who Make Frequent ED Visits in Alberta.

Clusters	1	2	3	4	5	6	7	8	9	10
W	1036250	888931.5	785195.	705481.	652290.	603873.	560312.	523294.	491721.	462621.
Pseudo F	Inf	17173.12	16565.9	16194.5	15248.6	14838.4	14669.2	14510.0	14343.0	14275.4

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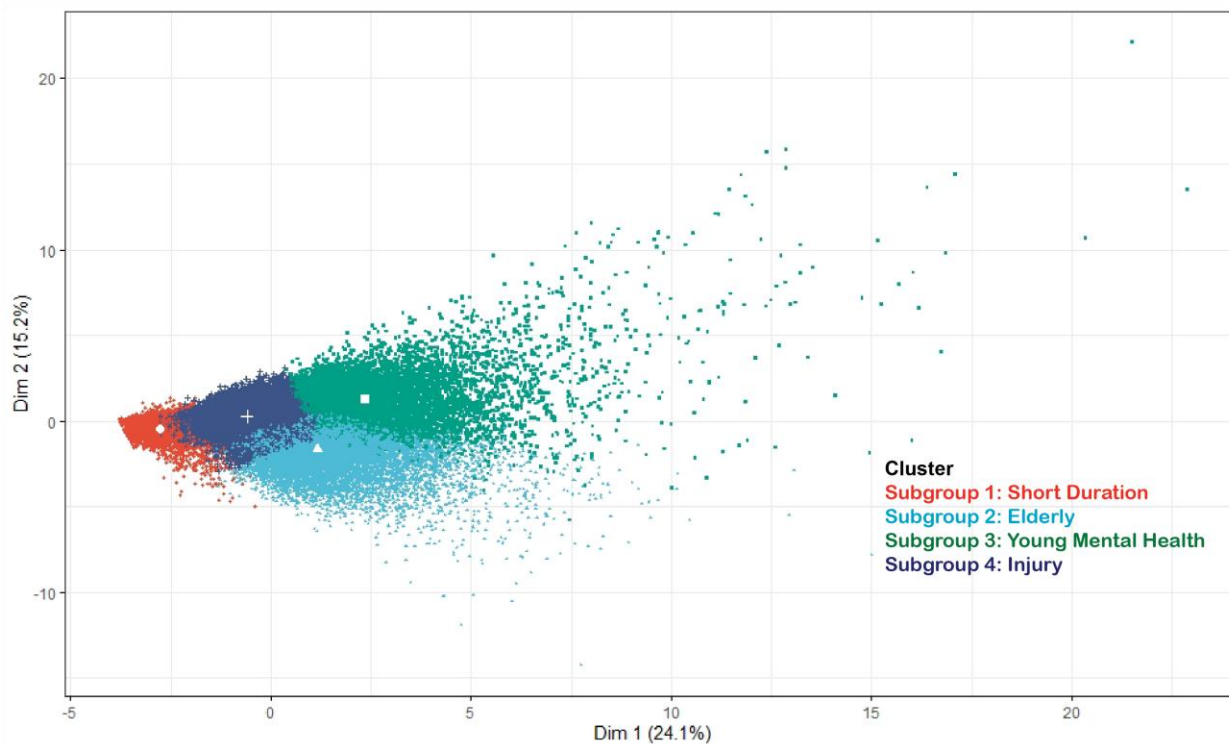
Appendix Figure 4: Elbow Plot Associated with Cluster Number Among People Who Make Frequent ED Visits in Alberta.



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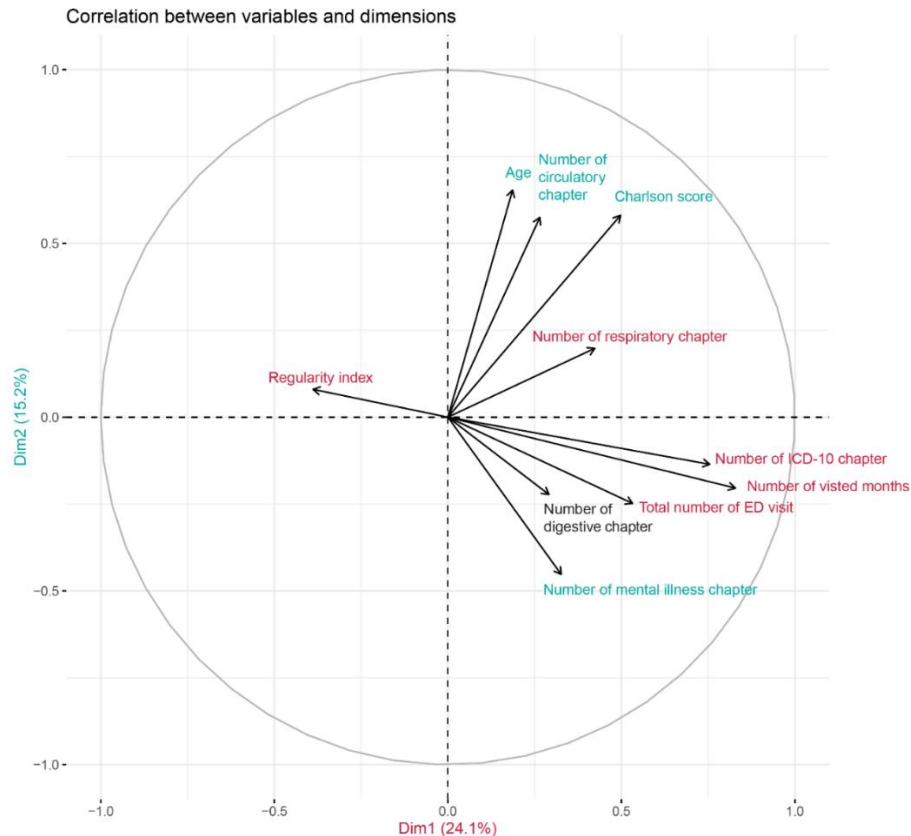
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Appendix Figure 5: Graphical Representation of Subgroups of People Who Make Frequent ED Visits in Alberta.



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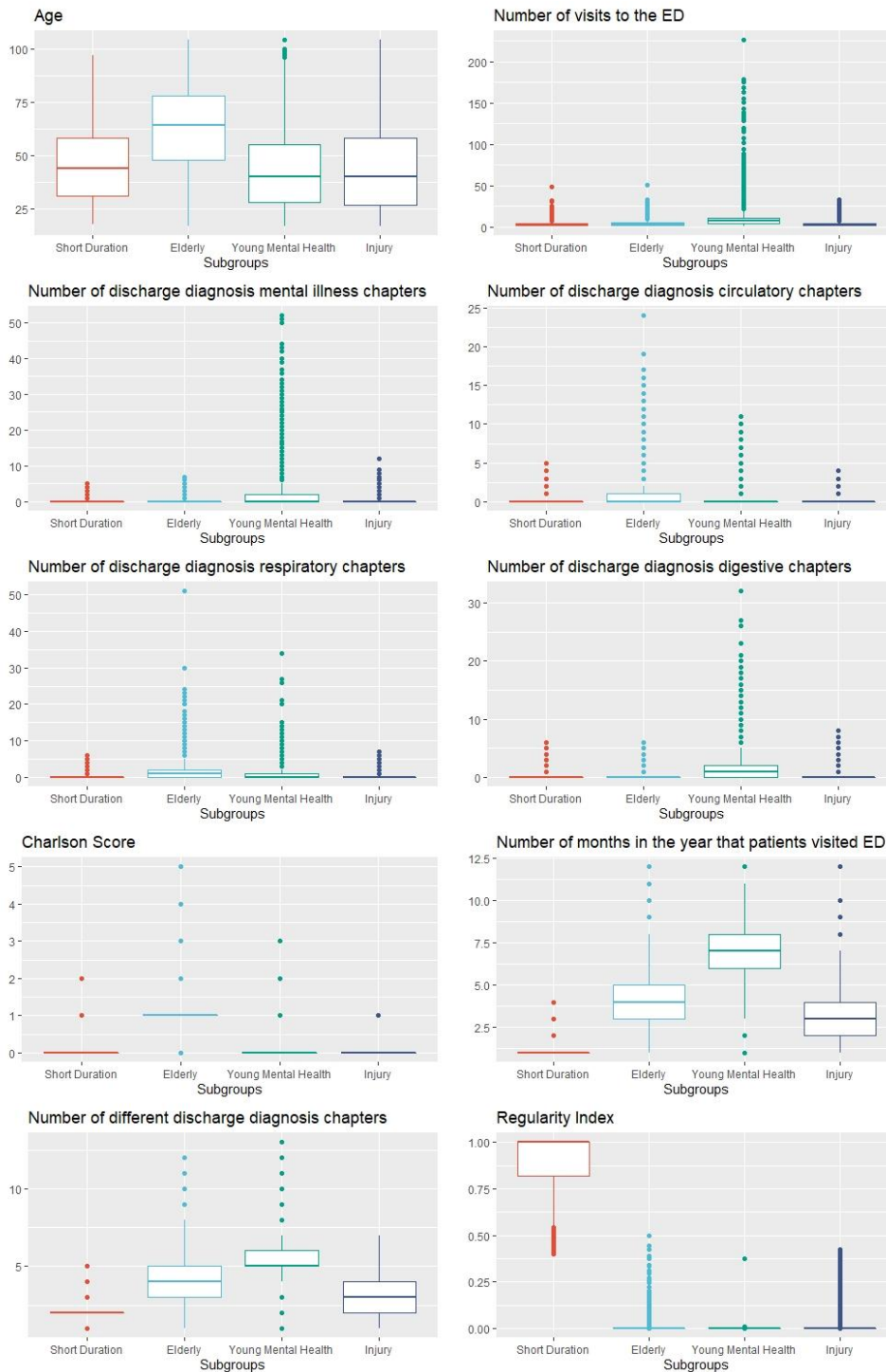
We were interested in a graphical representation of our subgroups, but doing so requires a reduction of the dimensionality of the data so that it can be represented on a graph. One approach to this is to apply a principal components-type analysis after clustering, and then plotting the most important variables vs. the second most important (these are Dim1 and Dim2). Supplementary Figure 5 showed clusters of samples based on their similarity. Dimension 1 (Dim 1) accounted for 24.1% of the information. Dimension 2 (Dim 2) accounted for 15.2% of the information. The variation within Subgroups 2 and 3 was higher than for Subgroups 1 and 4.

The plot above suggests that number of ICD-10-CA ED discharge diagnoses pertaining to respiratory, number of distinct ICD-10-CA diagnostic chapters, number of months that the patient visited an ED, and ED visit number had a strong positive effect on Dimension 1. Regularity index had a strong negative effect on Dimension 1. Age at index, Charlson comorbidity score, and number of ICD-10-CA ED discharge diagnoses pertaining to circulatory concerns had strong positive effect on Dimension 2. Number of ICD-10-CA ED discharge diagnoses pertaining to mental health had strong negative effect on Dimension 2.

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Appendix Figure 6: Distribution Among Clustering Variables for People Who Make Frequent ED Visits in Alberta



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Appendix Table 5: Demographic and Healthcare Utilization Characteristics of People Who Make Frequent ED Visits in Ontario (Detailed Diagnostic Codes).

Characteristics	April 1st 2011- March 31st 2012	April 1st 2012- March 31st 2013	April 1st 2013- March 31st 2014	April 1st 2014- March 31st 2015	April 1st 2015- March 31st 2016
<i>ED Visit Characteristics (NACRS)</i>					
Number of patients	435,334	446,954	451,568	465,949	477,647
Number of ED visits	2,004,975	2,053,609	2,079,281	2,149,965	2,213,161
Top 5, ICD-10 main problem chapter, n (%)					
Diseases of the respiratory system (X)	162,000 (8.1)	170,897 (8.3)	160,762 (7.7)	180,688 (8.4)	178,433 (8.1)
Diseases of the musculoskeletal system and connective tissue (XIII)	136,297 (6.8)	137,722 (6.7)	140,076 (6.7)	146,490 (6.8)	154,688 (7.0)
Symptoms, signs and abnormal clinical and laboratory findings (XVIII)	412,928 (20.6)	427,536 (20.8)	442,744 (21.3)	458,415 (21.3)	473,430 (21.4)
Injury, poisoning and certain other consequences of external causes (XIX)	285,123 (14.2)	294,076 (14.3)	300,560 (14.5)	305,651 (14.2)	320,186 (14.5)
Factors influencing health status and contact with health services (XXI)	215,204 (10.7)	212,930 (10.4)	210,348 (10.1)	205,890 (9.6)	202,791 (9.2)
<i>Hospital Admission Characteristics (DAD)</i>					
Number of admissions	255,202	268,573	276,307	284,787	292,411
Top 5 ICD-10 diagnosis chapters 1 simplified, n (%)					
Diseases of the circulatory system (IX)	45,573 (17.9)	46,974 (17.5)	48,260 (17.5)	49,267 (17.3)	50,029 (17.1)
Diseases of the respiratory system (X)	29,491 (11.6)	32,452 (12.1)	32,177 (11.6)	36,479 (12.8)	35,749 (12.2)
Diseases of the digestive system (XI)	36,263 (14.2)	37,876 (14.1)	39,235 (14.2)	38,983 (13.7)	41,150 (14.1)
Symptoms and abnormal clinical and laboratory findings, not otherwise classified (XVIII)	26,679 (10.5)	27,441 (10.2)	27,767 (10.0)	27,771 (9.8)	27,636 (9.5)

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Injury, poisoning and certain other consequences of external causes (XIX)	24,054 (9.4)	25,134 (9.4)	26,302 (9.5)	26,175 (9.2)	27,506 (9.4)
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Footnote: * Emergency department (ED), National Ambulatory Care Reporting System metadata (NACRS), International Statistical Classification of Diseases and Related Health Problems (ICD-10-CA), Discharge Abstract Database metadata (DAD).

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Appendix Table 6: Demographic and Healthcare Utilization Characteristics of People Who Make Frequent ED Visits in Alberta (Detailed Diagnostic Codes).

Characteristics	April 1 st 2011- March 31 st 2012	April 1 st 2012- March 31 st 2013	April 1 st 2013- March 31 st 2014	April 1 st 2014- March 31 st 2015	April 1 st 2015- March 31 st 2016
<i>ED Visit Characteristics (NACRS)</i>					
Number of patients	98,840	102,781	103,711	105,047	102,027
Number of ED visits	680,740	699,962	700,347	704,256	690,330
Top 5, ICD-10 main problem chapter, n (%)					
1	Factors influencing health status and contract with health services (XXI): 176,635 (25.9)	Factors influencing health status and contract with health services (XXI): 174,778 (25.0)	Factors influencing health status and contract with health services (XXI): 170,621 (24.4)	Factors influencing health status and contract with health services (XXI): 162,792 (23.1)	Factors influencing health status and contract with health services (XXI): 155,595 (22.5)
2	Symptoms, signs and abnormal clinical and laboratory findings (XVIII): 97,120 (14.3)	Symptoms, signs and abnormal clinical and laboratory findings (XVIII): 100,856 (14.4)	Symptoms, signs and abnormal clinical and laboratory findings (XVIII): 104,234 (14.9)	Symptoms, signs and abnormal clinical and laboratory findings (XVIII): 108,528 (15.4)	Symptoms, signs and abnormal clinical and laboratory findings (XVIII): 109,645 (15.9)
3	Injury, poisoning and certain other consequences of external causes (XIX): 83,836 (12.3)	Injury, poisoning and certain other consequences of external causes (XIX): 88,125 (12.6)	Injury, poisoning and certain other consequences of external causes (XIX): 89,318 (12.8)	Injury, poisoning and certain other consequences of external causes (XIX): 90,696 (12.9)	Injury, poisoning and certain other consequences of external causes (XIX): 88,772 (12.9)
4	Diseases of the respiratory system (X): 52,425 (7.7)	Diseases of the respiratory system (X): 55,897 (8.0)	Diseases of the respiratory system (X): 53,191 (7.6)	Diseases of the respiratory system (X): 54,796 (7.8)	Diseases of the respiratory system (X): 50,195 (7.3)
5	Diseases of the musculoskeletal system and connective tissue (XIII): 39,632 (5.8)	Diseases of the musculoskeletal system and connective tissue (XIII): 40,971 (5.9)	Diseases of the musculoskeletal system and connective tissue (XIII):	Diseases of the digestive system (XI): 40,888 (5.8)	Mental and behavioral disorders (V): 40,297 (5.8)

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41,019 (5.9)

<i>Hospital Admission Characteristics (DAD)</i>					
Number of admissions	66,843	70,069	72,127	73,466	75,014
Top 5 ICD-10 diagnosis chapters 1 simplified, n (%)					
Mental and behavioral disorders (V)	6,736 (10.1)	7,244 (10.3)	7,824 (10.8)	8,143 (11.1)	8,608 (11.5)
Diseases of the circulatory system (IX)	8,328 (12.5)	8,734 (12.5)	8,865 (12.3)	9,319 (12.7)	9,415 (12.6)
Diseases of the respiratory system (X)	7,196 (10.8)	7,906 (11.3)	7,957 (11.0)	8,778 (11.9)	8,679 (11.6)
Diseases of the digestive system (XI)	8,945 (13.4)	9,186 (13.1)	9,534 (13.2)	9,828 (13.4)	9,910 (13.2)
Injury, poisoning and certain other consequences of external causes (XIX)	6,966 (10.4)	7,310 (10.4)	7,556 (10.5)	7,823 (10.6)	7,904 (10.5)

Footnote: * Emergency department (ED), National Ambulatory Care Reporting System metadata (NACRS), International Statistical Classification of Diseases and Related Health Problems (ICD-10-CA), Discharge Abstract Database metadata (DAD).

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Appendix Table 7: Patient and Healthcare Utilization Characteristics of People Who Make Frequent ED Visits and Controls (April 1st, 2015 to March 31st, 2016) by Province (Detailed Diagnostic Codes).

	People Who Make Frequent ED Visits in Ontario (N=477,647)	Control Cohort in Ontario (N=1,711,848)	People Who Make Frequent ED Visits in Alberta (N=102,027)	Control Cohort in Alberta (N=404,111)
<i>Hospitalization Characteristics (DAD)</i>				
Number of patients with at least one admission, n (%)	157,965 (33.1)	186,498 (10.9)	38,464 (37.7)	50,348 (12.5)
Number of admissions	292,411	211,916	75,014	59,728
ICD-10 main problem chapter among admissions, n (%)				
Certain infectious and parasitic diseases (I)	13,966 (4.8)	8,194 (3.9)	2,624 (3.5)	1,738 (2.9)
Neoplasms and diseases of the blood (II and III)	18,315 (6.3)	11,092 (5.2)	3,439 (4.6)	2,778 (4.7)
Endocrine, nutritional and metabolic diseases (IV)	12,236 (4.2)	5,688 (2.7)	3,028 (4.0)	1,543 (2.6)
Mental and behavioural disorders (V)	10,187 (3.5)	4,202 (2.0)	8,608 (11.5)	4,754 (8.0)
Diseases of the nervous system (VI)	6,983 (2.4)	4,583 (2.2)	1,655 (2.2)	1,264 (2.1)
Diseases of the eye, adnexa, ear and mastoid process (VII&VIII)	836 (0.3)	1,114 (0.5)	242 (0.3)	385 (0.6)
Diseases of the circulatory system (IX)	50,029 (17.1)	45,727 (21.6)	9,415 (12.6)	9,660 (16.2)
Diseases of the respiratory system (X)	35,749 (12.2)	20,607 (9.7)	8,679 (11.6)	5,353 (9.0)
Diseases of the digestive system (XI)	41,150 (14.1)	34,488 (16.3)	9,910 (13.2)	8,722 (14.6)
Diseases of the skin and subcutaneous tissue (XII)	5,120 (1.8)	2,015 (1.0)	1,653 (2.2)	645 (1.1)
Diseases of the musculoskeletal system and connective tissue (XIII)	8,113 (2.8)	4,757 (2.2)	1,975 (2.6)	1,352 (2.3)
Diseases of the genitourinary system (XIV)	19,100 (6.5)	10,740 (5.1)	4,695 (6.3)	3,563 (6.0)
Pregnancy, childbirth and the puerperium (XV)	5,417 (1.9)	6,688 (3.2)	2,848 (3.8)	2,853 (4.8)
Certain conditions originating in the perinatal period (XVI)	0 (0.0)	1 (0.0)	2 (0.0)	0 (0.0)
Congenital malformations, deformations and chromosomal abnormalities (XVII)	124 (0.0)	110 (0.1)	44 (0.1)	47 (0.1)
Symptoms and abnormal clinical and laboratory findings, not otherwise classified (XVIII)	27,636 (9.5)	15,969 (7.5)	5,523 (7.4)	3,374 (5.6)

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Injury, poisoning and certain other consequences of external causes (XIX)	27,506 (9.4)	27,818 (13.1)	7,904 (10.5)	9,135 (15.3)
Factors influencing health status and contact with health services (XXI)	9,944 (3.4)	8,122 (3.8)	2,770 (3.7)	2,560 (4.3)
NA	0 (0.0)	1 (0.0)	0 (0.0)	2 (0.0)

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Appendix Table 8: Cluster analysis and Subgroup Characterization Among People Who Make Frequent ED Visits in Ontario, April 1st, 2013 to March 31st, 2014 (Detailed Diagnostic Codes).

	Subgroup 1 (Short Duration)	Subgroup 2 (Older Patients)	Subgroup 3 (Young Mental Health)	Subgroup 4 (Injury)
Number of patients	34,116	74,995	49,167	292,704
Age, median (IQR)	49 (32-64)	69 (54-80)	45 (29-63)	47 (30-65)
Number of visits to the ED, median (IQR)	2 (1-3)	3 (2-4)	6 (4-8)	2 (1-3)
Number of discharge diagnosis mental illness chapters, median (IQR)	0 (0-0)	0 (0-0)	0 (0-1)	0 (0-0)
Number of discharge diagnosis circulatory chapters, median (IQR)	0 (0-0)	0 (0-1)	0 (0-0)	0 (0-0)
Number of discharge diagnosis respiratory chapters, median (IQR)	0 (0-0)	1 (0-2)	0 (0-1)	0 (0-0)
Number of discharge diagnosis digestive chapters, median (IQR)	0 (0-0)	0 (0-0)	0 (0-1)	0 (0-0)
Charlson comorbidity index, median (IQR)	0 (0-0)	1 (1-1)	0 (0-0)	0 (0-0)
Number of different discharge diagnosis chapters, median (IQR)	2 (2-2)	3 (2-4)	5 (4-6)	3 (2-3)
Number of months in the year that patients	1 (1-2)	3 (3-4)	6 (5-7)	3 (2-3)

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visited ED, median (IQR)

Regularity index, median (IQR) 1 (0.8-1) 0.9x10⁻⁷ (0.6x10⁻⁷-6.8x10⁻⁵) 1.3x10⁻⁷ (0.9x10⁻⁷-2.2x10⁻⁷) 0.9x10⁻⁷ (0.5x10⁻⁷-1.2x10⁻⁴)

Number of patients 34,116 74,995 49,167 292,704

Sex

Female	16,875 (49.5)	39,575 (52.8)	29,136 (59.3)	166,034 (56.7)
Male	17,241 (50.5)	35,420 (47.2)	20,030 (40.7)	126,667 (43.3)
Other (transsexual, hermaphrodite)	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.0)
Undifferentiated	0 (0.0)	0 (0.0)	1 (0.0)	1 (0.0)
NA	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.0)

Rural/urban, n (%)

Rural	7,361 (21.6)	15,945 (21.3)	10,957 (22.3)	58,949 (20.1)
Urban	26,669 (78.2)	58,923 (78.6)	37,485 (76.2)	232,647 (79.5)
NA	86 (0.3)	127 (0.2)	725 (1.5)	1,108 (0.4)

Number of ED visits 113,990 386,011 563,397 1,187,131

Top 5, ICD-10 ED diagnosis chapters, n (%)

Factors influencing health status and contract with health services (XXI), 24,795 (21.8)	Diseases of the respiratory system (X), 77,541 (20.1)	Symptoms, signs and abnormal clinical and laboratory findings (XVIII), 123,315 (21.9)	Symptoms, signs and abnormal clinical and laboratory findings (XVIII), 264,031 (22.2)
Symptoms, signs and abnormal clinical and laboratory findings (XVIII), 19,285 (16.9)	Symptoms, signs and abnormal clinical and laboratory findings (XVIII), 73,106 (18.9)	Mental and behavioral disorders (V), 65,626 (11.6)	Injury, poisoning and certain other consequences of external causes (XIX), 210,374 (17.7)
Injury, poisoning and certain other consequences of external causes (XIX),	Diseases of the circulatory system (IX), 58,144 (15.1)	Factors influencing health status and contract with health services (XXI),	Factors influencing health status and contract with health services (XXI),

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	15,663 (13.7)		63,746 (11.3)	115,539 (9.7)
	Diseases of the skin and subcutaneous tissue (XII), 9,765 (8.6)	Injury, poisoning and certain other consequences of external causes (XIX), 32,607 (8.4)	Injury, poisoning and certain other consequences of external causes (XIX), 61,927 (11.0)	Diseases of the musculoskeletal system and connective tissue (XIII), 90,508 (7.6)
	Diseases of the digestive system (XI), 7,764 (6.8)	Factors influencing health status and contact with health services (XXI), 22,428 (5.8)	Diseases of the digestive system (XI), 47,698 (8.5)	Diseases of the genitourinary system (XIV), 86,594 (7.3)
NA	(0.0)	(0.0)	(0.0)	(0.0)

Top 5 ICD-10 ED primary diagnosis, n (%)

	Other chemotherapy (Z512), 13,082 (11.5)	COPD, with acute exacerbation (J441), 23,782 (4.2)	Other and unspecified abdominal pain (R104), 23,782 (4.2)	Other and unspecified abdominal pain (R104), 46,055 (3.9)
	Other and unspecified abdominal pain (R104), 3,944 (3.5)	Asthma, unspecified (J4590), 15,192 (2.7)	Other chemotherapy (Z512), 15,192 (2.7)	Urinary tract infection (N390), 37,335 (3.1)
	Attention to surgical dressings and sutures (Z480), 3,151 (2.8)	Pneumonia, unspecified (J189), 15,025 (2.7)	Urinary tract infection (N390), 15,025 (2.7)	Chest pain, unspecified (R074), 31,801 (2.7)
	Cellulitis of lower limb (L0311), 3,107 (2.7)	Bronchitis, not specified as acute or chronic (J40), 12,552 (2.2)	Chest pain, unspecified (R074), 12,552 (2.2)	Other chemotherapy (Z512), 26,497 (2.2)
	Cellulitis of upper limb (L0310), 2,021 (1.8)	Congestive heart failure (I500), 10,268 (1.8)	Mental and behavioral disorders due to use of alcohol, acute intoxication (F100), 10,268 (1.8)	Cellulitis of lower limb (L0311), 16,941 (1.4)
NA	(0.0)	(0.0)	(0.0)	(0.0)
Discharged	92,928 (81.5)	266,750 (69.1)	455,419 (80.8)	1,003,316 (84.5)
Patient left the emergency department at his/her own risk	4,525 (4.0)	8,323 (2.2)	32,546 (5.8)	43,506 (3.7)

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Admitted to in-patient facility	9,544 (8.4)	101,667 (26.3)	64,298 (11.4)	121,653 (10.2)
Transferred to another facility	6,952 (6.1)	8,706 (2.3)	10,989 (2.0)	18,268 (1.5)
Death	41 (0.0)	565 (0.1)	145 (0.0)	388 (0.0)
NA	(0.0)	(0.0)	(0.0)	(0.0)

	Subgroup 1 (Short Duration, N=34,116)	Subgroup 2 (Older Patients, N=74,995)	Subgroup 3 (Young Mental Health, N=49,167)	Subgroup 4 (Injury, N=292,704)
Number of patients with at least one admission, n (%)	6,825 (20.0)	45,430 (60.6)	21,745 (44.2)	72,084 (24.6)
Number of admissions	8,078	100,924	57,359	110,157
Number of admissions per patient, median (IQR)	2 (1-3)	1 (1-2)	2 (1-3)	1 (1-1)
Median length of stay in days, median (IQR)	3 (1-6)	4 (2-8)	4 (2-8)	5 (3-10)
Top 5 ICD-10 primary diagnosis chapters, n (%)				
	Diseases of the digestive system (XI), 1,574 (19.5)	Diseases of the circulatory system (IX), 30,001 (29.7)	Diseases of the digestive system (XI), 12,229 (21.3)	Diseases of the digestive system (XI), 19,370 (17.6)
	Injury, poisoning and certain other consequences of external causes (XIX), 1,351 (16.7)	Diseases of the respiratory system (X), 20,441 (20.3)	Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified (XVIII), 6,901 (12.0)	Injury, poisoning and certain other consequences of external causes (XIX), 14,330 (13.0)
	Diseases of the circulatory system (IX), 1,286 (15.9)	Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified (XVIII), 7,836 (7.8)	Injury, poisoning and certain other consequences of external causes (XIX), 5,604 (9.8)	Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified (XVIII), 12,961 (11.8)
	Symptoms, signs and abnormal clinical and laboratory findings, not	Neoplasms and diseases of the blood (C &D),	Diseases of the circulatory system (IX),	Diseases of the circulatory system (IX),

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	elsewhere classified (XVIII), 599 (7.4)	7,459 (7.4)	4,707 (8.2)	12,934 (11.7)
	Diseases of the genitourinary system (XIV), 560 (6.9)	Diseases of the digestive system (XI), 6,693 (6.6)	Diseases of the genitourinary system (XIV), 4,615 (8.0)	Diseases of the genitourinary system (XIV), 9,034 (8.2)
NA	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
No	8,027 (99.4)	100,643 (99.7)	55,351 (96.5)	108,918 (98.9)
Yes	51 (0.6)	281 (0.3)	2,008 (3.5)	1,239 (1.1)
NA	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
	Subgroup 1 (Short Duration, N=34,116)	Subgroup 2 (Older Patients, N=74,995)	Subgroup 3 (Young Mental Health, N=49,167)	Subgroup 4 (Injury, N=292,704)
Number of patients with at least one mental health admission, n (%)	1,103 (3.2)	4,955 (6.6)	10,048 (20.4)	20,031 (6.8)
Number of mental health admissions	1,926	8,467	40,406	45,035
DAD	363 (18.8)	4,365 (51.6)	8,555 (21.2)	9,482 (21.1)
OMHRS	1,563 (81.2)	4,102 (48.4)	31,851 (78.8)	35,553 (78.9)
Homelessness status among patients with at least one mental health admission, n (%)	113 (5.9)	214 (2.5)	3,874 (9.6)	2,264 (5.0)
Age among patients with at least one mental health admission, median (IQR)	45 (29-58)	72 (56-83)	42 (28-56)	43 (28-60)
Number of mental health admissions per person among patients with at least one mental health admission, median (IQR)	1 (1-2)	1 (1-2)	2 (1-5)	1 (1-3)

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Involuntary admissions among mental health admissions, n (%)	308 (16)	816 (9.6)	6,172 (15.3)	6,877 (15.3)
Length of stay in days among mental health admissions, median (IQR)	9 (3-21)	9 (3-20)	5 (2-13)	7 (3-17)
Discharged home	1,588 (82.5)	6,274 (74.1)	32,718 (81.0)	37,605 (83.5)
Transferred	210 (10.9)	1,780 (21.0)	3,184 (7.9)	4,338 (9.6)
Died	3 (0.2)	95 (1.1)	35 (0.1)	121 (0.3)
Left against medical advice	39 (2.0)	114 (1.3)	1,427 (3.5)	831 (1.8)
Other (cadaveric donor, homeless, and other)	86 (4.5)	204 (2.4)	3,042 (7.5)	2,140 (4.8)
NA	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mood disorders	629 (32.7)	1,967 (23.2)	10,473 (25.9)	14,071 (31.2)
Schizophrenic and psychotic disorders	524 (27.2)	1,291 (15.2)	9,852 (24.4)	11,582 (25.7)
Substance related disorders	337 (17.5)	1,150 (13.6)	10,686 (26.4)	8,766 (19.5)
Organic disorders	177 (9.2)	3,097 (36.6)	1,379 (3.4)	3,606 (8.0)
Other mental health disorders	137 (7.1)	423 (5.0)	3,248 (8.0)	3,478 (7.7)
Anxiety disorders	57 (3.0)	344 (4.1)	1,582 (3.9)	1,772 (3.9)
Personality disorders	51 (2.6)	162 (1.9)	2,964 (7.3)	1,517 (3.4)
Non-mental health disorders	11 (0.6)	30 (0.4)	177 (0.4)	183 (0.4)
Unknown Disorders	3 (0.2)	3 (0.0)	45 (0.1)	60 (0.1)
NA	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

Footnote: Emergency department (ED), National Ambulatory Care Reporting System metadata (NACRS), Interquartile range (IQR), Chronic obstructive pulmonary disease (COPD), International Statistical Classification of Diseases and Related Health Problems (ICD-10-CA), Discharge Abstract Database (DAD), Hospital Mental Health Database Metadata (HMHDB), Ontario Mental Health Reporting System (OMHRS).

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Appendix Table 9: Cluster Analysis and Subgroup Characterization Among People Who Made Frequent ED Visits in Alberta, April 1st 2013 to March 31st 2014 (Detailed Diagnostic Codes).

	Subgroup 1 (Short Duration)	Subgroup 2 (Older Patients)	Subgroup 3 (Young Mental Health)	Subgroup 4 (Injury)
<i>Subgroup Characteristics (Clustering Variables)</i>				
Number of patients	4,301	18,776	12,827	67,722
Age, median (IQR)	44 (31-58)	64 (48-78)	40 (28-55)	40 (27-58)
Number of visits to the ED, median (IQR)	3 (2-4)	3 (2-5)	7 (4-11)	3 (2-4)
Number of discharge diagnosis mental illness chapters, median (IQR)	0 (0-0)	0 (0-0)	0 (0-2)	0 (0-0)
Number of discharge diagnosis circulatory chapters, median (IQR)	0 (0-0)	0 (0-1)	0 (0-0)	0 (0-0)
Number of discharge diagnosis respiratory chapters, median (IQR)	0 (0-0)	1 (0-2)	0 (0-1)	0 (0-0)
Number of discharge diagnosis digestive chapters, median (IQR)	0 (0-0)	0 (0-0)	1 (0-2)	0 (0-0)
Charlson comorbidity index, median (IQR)	0 (0-0)	1 (1-1)	0 (0-0)	0 (0-0)
Number of different discharge diagnosis chapters, median (IQR)	2 (2-2)	4 (3-5)	5 (5-6)	3 (2-4)
Number of months in the year that patients	1 (1-1)	4 (3-5)	7 (6-8)	3 (2-4)

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visited ED, median (IQR)

Regularity index, median (IQR) 1 (0.8-1) 1×10^{-7} (0.7×10^{-7} - 3.8×10^{-5}) 1.6×10^{-7} (1.2×10^{-7} - 2.6×10^{-7}) 0.9×10^{-7} (0.6×10^{-7} - 8.6×10^{-5})

Patient Characteristics (NACRS)

Number of patients **4,301** **18,776** **12,827** **67,722**

Sex

Female 1,868 (43.4) 9,744 (51.9) 7,766 (60.5) 37,888 (55.9)
 Male 2,433 (56.6) 9,032 (48.1) 5,060 (39.4) 29,833 (44.1)
 NA 0 (0.0) 0 (0.0) 1 (0.0) 1 (0.0)

Rural/urban, n (%)

Rural 1,428 (33.2) 6,720 (35.8) 5,526 (43.1) 22,378 (33.0)
 Urban 2,850 (66.3) 11,921 (63.5) 6,846 (53.4) 44,610 (65.9)
 NA 23 (0.5) 135 (0.7) 455 (3.5) 734 (1.1)

ED Visit Characteristics

Number of ED visits **499,395** **1,587,307** **139,770** **780,967**

Top 5, ICD-10 ED diagnosis chapters, n (%)

Factors influencing health status and contract with health services (XXI), 16,010 (62.2)	Diseases of the respiratory system (X), 25,965 (19.2)	Factors influencing health status and contract with health services (XXI), 55,758 (27.1)	Factors influencing health status and contract with health services (XXI), 89,826 (23.3)
Diseases of the skin and subcutaneous tissue (XII), 1,878 (7.3)	Factors influencing health status and contract with health services (XXI), 20,731 (15.4)	Symptoms, signs and abnormal clinical and laboratory findings (XVIII), 29,857 (14.5)	Injury, poisoning and certain other consequences of external causes (XIX), 61,323 (15.9)
Symptoms, signs and abnormal clinical and laboratory findings (XVIII), 1,503 (5.8)	Symptoms, signs and abnormal clinical and laboratory findings (XVIII), 20,646 (15.3)	Injury, poisoning and certain other consequences of external causes (XIX), 21,016 (10.2)	Symptoms, signs and abnormal clinical and laboratory findings (XVIII), 59,806 (15.5)
Injury, poisoning and certain other	Diseases of the circulatory system (IX),	Mental and behavioural disorders (V),	Diseases of the musculoskeletal system and

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	consequences of external causes (XIX), 1,485 (5.8)	14,914 (11.1)	20,583 (10.0)	connective tissue (XIII), 24,335 (6.3)
	Diseases of the digestive system (XI), 1,033 (4.0)	Injury, poisoning and certain other consequences of external causes (XIX), 10,892 (8.1)	Diseases of the digestive system (XI), 15,248 (7.4)	Diseases of the genitourinary system (XIV), 23,424 (6.1)
NA	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Top 5 ICD-10 ED primary diagnosis, n (%)				
	Other chemotherapy (Z512), 12,356 (48.0)	Other chemotherapy (Z512), 9,492 (7.0)	Other chemotherapy (Z512), 31,466 (15.3)	Other chemotherapy (Z512), 38,202 (9.9)
	Attention to surgical dressings and sutures (Z480), 1,574 (6.1)	COPD, with acute exacerbation (J441), 4,599 (3.4)	Attention to surgical dressings and sutures (Z480), 6,016 (2.9)	Attention to surgical dressings and sutures (Z480), 12,771 (3.3)
	Other specified medical care NEC (Z5188), 823 (3.2)	Bronchitis, not specified as acute or chronic (J40), 4,241 (3.1)	Other and unspecified abdominal pain (R104), 5,650 (2.7)	Urinary tract infection (N390), 9,159 (2.4)
	Cellulitis of lower limb (L0311), 623 (2.4)	Congestive heart failure (I500), 3,919 (2.9)	Urinary tract infection (N390), 4,044 (2.0)	Other and unspecified abdominal pain (R104), 9,075 (2.4)
	Periapical abscess without sinus (K047), 372 (1.4)	Asthma, unspecified (J4590), 3,025 (2.2)	Mental and behavioral disorders due to use of alcohol, acute intoxication (F100), 4,329 (2.1)	Other specified orthopaedic follow-up care (Z478), 8,380 (2.2)
NA	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Visit disposition, n (%)				
Discharged	23,892 (92.9)	102,510 (76.0)	177,626 (86.3)	334,800 (87.0)
Patient left the emergency department at his/her own risk	409 (1.6)	3,306 (2.5)	10,731 (5.2)	14,663 (3.8)
Admitted to in-patient facility	762 (3.0)	24,873 (18.4)	14,082 (6.8)	27,476 (7.1)
Transferred to another facility	654 (2.5)	4,090 (3.0)	3,376 (1.6)	7,861 (2.0)
Death	2 (0.0)	119 (0.1)	37 (0.0)	53 (0.0)

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NA 0 (0.0) 0 (0.0) 0 (0.0) 0 (0.0)

Hospitalization Characteristics (DAD)

	Subgroup 1 (Short Duration, N=4,301)	Subgroup 2 (Older Patients, N=18,776)	Subgroup 3 (Young Mental Health, N=12,827)	Subgroup 4 (Injury, N=67,722)
Number of patient with at least one admission, n (%)	603 (14.0)	10,926 (58.2)	6,209 (48.4)	18,857 (27.8)
Number of admissions	728	26,281	15,937	29,826
Number of admissions per patient, median (IQR)	1 (1-1)	2 (1-3)	2 (1-3)	1 (1-2)
Median length of stay in days, median (IQR)	5 (3-10)	4 (2-8)	3 (1-6)	4 (2-8)
Top 5 ICD-10 primary diagnosis chapters, n (%)				
	Diseases of the digestive system (XI), 125 (17.2)	Diseases of the circulatory system (IX), 6,145 (23.4)	Mental and behavioral disorders (V), 3,522 (22.1)	Diseases of the digestive system (XI), 4,581 (15.4)
	Injury, poisoning and certain other consequences of external causes (XIX), 120 (16.5)	Diseases of the respiratory system (X), 5,693 (21.7)	Diseases of the digestive system (XI), 2,933 (18.4)	Injury, poisoning and certain other consequences of external causes (XIX), 4,404 (14.8)
	Diseases of the genitourinary system (XIV), 73 (10)	Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified (XVIII), 2,175 (8.3)	Injury, poisoning and certain other consequences of external causes (XIX), 1,655 (10.4)	Mental and behavioral disorders (V), 3,526 (11.8)
	Pregnancy, childbirth and the puerperium (XV), 71 (9.8)	Diseases of the digestive system (XI), 2,033 (7.7)	Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified (XVIII), 1,347 (8.5)	Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified (XVIII), 2,647 (8.9)
	Diseases of the circulatory system (IX), 57 (7.8)	Endocrine, nutritional and	Diseases of the respiratory system (X),	Diseases of the genitourinary system (XIV),

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		metabolic diseases (IV), 1,558 (5.9)	906 (5.7)	2,405 (8.1)
NA	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
All Alcohol-related diagnoses, n (%)				
No	726 (99.7)	26,117 (99.4)	14,479 (90.9)	28,939 (97.0)
Yes	2 (0.3)	164 (0.6)	1,458 (9.1)	887 (3.0)
NA	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

Mental Health Hospitalizations (HMHDB)

	Subgroup 1 (Short Duration, N=4,301)	Subgroup 2 (Older Patients, N=18,776)	Subgroup 3 (Young Mental Health, N=12,827)	Subgroup 4 (Injury, N=67,722)
Number of patients with at least one mental health admission, n (%)	58 (1.3)	1,399 (7.5)	2,842 (22.2)	4,522 (6.7)
Number of mental health admissions	85	2,400	10,065	9,439
Data source among mental health admissions, n (%)				
DAD	85 (100.0)	2,400 (100.0)	10,065 (100.0)	9,439 (100.0)
OMHRS	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Homelessness status among patients with at least one mental health admission, n (%)	3 (5.2)	34 (2.4)	283 (10.0)	209 (4.6)
Age among patients with at least one mental health admission, median (IQR)	35 (25-55)	68 (52-82)	39 (29-52)	41 (28-57)
Number of mental health admissions per person among patients with at least one mental health admission, median (IQR)	1 (1-2)	1 (1-2)	2 (1-4)	1 (1-2)

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Involuntary admissions among mental health admissions, n (%)	NA	NA	NA	NA
Length of stay in days among mental health admissions, median (IQR)	4 (2-21)	8 (3-23)	4 (2-10)	6 (2-15)
Discharge disposition among mental health admissions, n (%)				
Discharged home	69 (81.2)	1,792 (74.7)	7,936 (78.8)	7,579 (80.3)
Transferred	13 (15.3)	428 (17.8)	822 (8.2)	1,039 (11.0)
Died	0 (0)	29 (1.2)	5 (0.0)	15 (0.2)
Left against medical advice	3 (3.5)	151 (6.3)	1,302 (12.9)	806 (8.5)
Other (cadaveric donor, homeless, and other)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
NA	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Diagnosis category among mental health admissions, n (%)				
Mood disorders	18 (21.2)	433 (18)	1,629 (16.2)	2,137 (22.6)
Schizophrenic and psychotic disorders	19 (22.4)	288 (12)	1,350 (13.4)	1,555 (16.5)
Substance related disorders	20 (23.5)	536 (22.3)	4,583 (45.5)	3,236 (34.3)
Organic disorders	9 (10.6)	739 (30.8)	252 (2.5)	587 (6.2)
Other mental health disorders	12 (14.1)	210 (8.8)	1,110 (11.0)	1,144 (12.1)
Anxiety disorders	4 (4.7)	146 (6.1)	407 (4.0)	421 (4.5)
Personality disorders	1 (1.2)	43 (1.8)	708 (7.0)	322 (3.4)
Non-mental health disorders	2 (2.4)	5 (0.2)	26 (0.3)	37 (0.4)
NA	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

Footnote: Emergency department (ED), National Ambulatory Care Reporting System metadata (NACRS), Interquartile range (IQR), Chronic obstructive pulmonary disease (COPD), International Statistical Classification of Diseases and Related Health Problems (ICD-10-CA), Discharge Abstract Database (DAD), Hospital Mental Health Database Metadata (HMHDB), Ontario Mental Health Reporting System (OMHRS).

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Appendix Table 10: Kolmogorov-Smirnov test of normality for continuous variables

Variables	Statistic	P value
NACRS		
Age	0.08	<0.001
Number of visits to the ED	0.23	<0.001
Number of discharge diagnosis mental illness chapters	0.23	<0.001
Number of discharge diagnosis circulatory chapters	0.50	<0.001
Number of discharge diagnosis respiratory chapters	0.45	<0.001
Number of discharge diagnosis digestive chapters	0.48	<0.001
Charlson comorbidity index	0.41	<0.001
Number of different discharge diagnosis chapters	0.44	<0.001
Number of months in the year that patients visited ED	0.49	<0.001
Regularity index	0.08	<0.001
DAD		
Number of admissions	0.27	<0.001
Length of stay	0.28	<0.001
HMHDB		
Number of mental health admissions	0.32	<0.001
Length of stay	0.42	<0.001

Footnote: Emergency department (ED), National Ambulatory Care Reporting System metadata (NACRS), Discharge Abstract Database (DAD), Hospital Mental Health Database Metadata (HMHDB).

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