Topic: Prevalence of Risk Factors for Developing Severe Acute Respiratory Syndrome Coronavirus 2 (COVID-19) in the Provincial Overdose Cohort

Date: April 23rd, 2020   **Data Source:** Provincial Overdose Cohort

Key Findings:
Compared to the general population, people who have had an overdose:

- Tend to be younger, but are more likely to have several co-occurring physical health conditions.
- Are at higher risk of severe COVID-19 symptoms because of these co-occurring conditions.
- Are likely to experience poverty and homelessness, limiting capacity for physical distancing and self-isolation.
- Experience competing risks of both the overdose crisis and COVID-19 pandemic.
  - The risk of overdose is higher when using substances alone (versus with others or in supervised settings). Access to safer environments to use substances has decreased during COVID-19.

Background:
Currently there are significant efforts to respond to the two public health emergencies of COVID-19 and overdose in British Columbia (BC) Canada.[1] This includes a comprehensive set of supports that help people who use substances maintain physical distance to prevent the spread of COVID-19 and reduce the likelihood of overdose.[i]

Purpose:
The purpose of this analysis was to estimate the baseline prevalence of risk factors associated with severe acute respiratory syndrome coronavirus 2 (COVID-19) in a cohort of people who have had a non-fatal overdose from 2015 to 2017.

Study Design and Methods:

- Our study used the 20% random population sample of BC residents from the Provincial Overdose Cohort (ODC), a total of 1,041,536 people. This included 19,005 people who had an overdose event in BC from January 1st 2015 to December 31st 2017.

- To estimate baseline prevalence of factors of interest, people who had a non-fatal overdose event were included in the analysis and people who died from overdose were excluded. People who did not have a recorded overdose event (from the general population sample) were the comparison group.

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[i] Risk mitigation strategies include provision of pharmaceutical alternatives to the toxic drug supply (see Reference 1); supports to continue access to Take-Home Naloxone, housing and food, rapid treatment and care pathways (including virtual care), and harm reduction services and supplies.

- The following risk factors related to serious COVID-19-related illness were examined: 1) chronic pulmonary disease (including asthma, chronic obstructive pulmonary disease (COPD)), 2) diabetes, 3) hypertension, 4) coronary heart disease, 5) age over 50 years, 6) male sex, and 7) multiple chronic health conditions. [2,3]

  o Risk factors 1-4 were identified in a person's health records using the following definition:
    - Having two physician billing records in the Medical Services Plan data OR one hospitalization record in the Discharge Abstract Database within one year.[4,5]
  o Risk factors 5 & 6 were identified from the Client Roster data for the year 2017.[6]
  o Risk factor 7 was defined using the Elixhauser Comorbidity Index (ECI) of 2+ using hospitalization data for chronic health conditions. Hospitalization records for respiratory illness, drug abuse, diabetes, hypertension, and coronary heart disease were excluded from the calculation.

- In the Cohort, we assessed for records indicating receipt of 1) income assistance and 2) no fixed address in social assistance data[ii] from 2015 and 2017.

- Chi-square tests were used to compare risk factors by overdose history. Logistic regression was used to calculate the odds ratio of having a risk factor for persons who had a previous overdose compared with persons who did not have an overdose after adjusting for age and sex.

Findings:

- A higher proportion of people who had a non-fatal overdose had chronic pulmonary disease, coronary heart disease, multiple chronic health conditions, and were male (Table 1).

- After controlling for age and sex, people who had a non-fatal overdose were significantly more likely to have three of the four known risk factors associated with serious COVID-19-related illness compared to people who did not have a previously recorded non-fatal overdose event. (Table 3).

- There were slight differences in the distribution of COVID-19 risk factors by region (Table 2).

- 56% of people who had a non-fatal overdose received social assistance (10,649 of 19,005 people) in the time period.
  o Among people who received social assistance, 54% had at least one record of no fixed address between 2015 and 2017 (5,716 of 10,649 people).

[ii] Data Source: The Ministry of Social Development and Poverty Reduction (SDPR)

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Interpretation:

- People who had a non-fatal overdose were more likely to have three of the four risk factors (chronic pulmonary disease, diabetes, and coronary heart disease) associated with serious COVID-19-related illness in comparison to persons who did not have a recorded non-fatal overdose (2015-2017).

- Among people who had a non-fatal overdose, a high proportion received income assistance and experienced homelessness (2015-2017).
    - Further work is needed to understand the impact of housing and income instability on the ability to physically distance and self-isolate, and the impact of isolation on the risk of overdose.

Key Limitations:

Non-fatal overdose and chronic health conditions are likely underestimated. A limitation of administrative health data is that it does not capture diagnoses and overdose events where health care services were not accessed.

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All inferences, opinions, and conclusions drawn in this Knowledge Update are those of the authors, and do not reflect the opinions or policies of the Data Steward(s).

References:

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Table 1. Risk factors for severe acute respiratory illness by overdose history

Risk factor	Persons without a Recorded Non-Fatal Overdose (N = 1,022,531)	Persons with a Recorded Non-Fatal Overdose (N = 19,005)	p- value*
1. Chronic pulmonary disease	67,104 (6.6)	2,102 (11.1)	< 0.001
2. Diabetes	66,278 (6.5)	1,010 (5.3)	< 0.001
3. Hypertension	125,860 (12.3)	1,341 (7.1)	< 0.001
4. Coronary heart disease	29,788 (2.9)	634 (3.3)	< 0.001
5. Age > 50	347,086 (33.9)	3,219 (16.9)	< 0.001
6. Sex Male	506,549 (49.5)	12,502 (65.8)	< 0.001
7. Elixhauser Comorbidity index† > 2	16,971 (1.7)	2,642 (13.9)	< 0.001

* Derived from chi-squared test.

† Excluded chronic pulmonary disease, drug abuse, diabetes, and hypertension from the index calculation.

Table 2. Risk factors for severe acute respiratory illness by overdose history by Health Authority

Risk factor	VCH		FHA		VIHA		NH		IH	
	Overdose cases	Non-Overdose cases	Overdose cases	Non-Overdose cases	Overdose cases	Non-Overdose cases	Overdose cases	Non-Overdose cases	Overdose cases	Non-Overdose cases
1. Respiratory illness	519 (11.1)	13,730 (5.6)	786 (11.9)	26,342 (7.4)	307 (10.2)	11,167 (7.0)	127 (10.2)	3,839 (6.5)	358 (12.6)	11,728 (7.5)
2. Diabetes	252 (5.4)	14,534 (6.0)	395 (6.0)	27,175 (7.6)	143 (4.8)	10,575 (6.6)	60 (4.8)	3,696 (6.2)	157 (5.5)	9,996 (6.4)
3. Hypertension	313 (6.7)	27,546 (11.3)	477 (7.2)	45,935 (12.9)	210 (7.0)	22,206 (13.8)	85 (6.9)	7,076 (11.9)	255 (9.0)	22,713 (14.5)
4. Coronary heart disease	163 (3.5)	6,158 (2.5)	245 (3.7)	11,773 (3.3)	80 (2.7)	4,670 (2.9)	33 (2.7)	1,396 (2.3)	112 (3.9)	5,720 (3.7)
5. Age: > 50	926 (19.8)	79,753 (32.7)	1,014 (15.3)	113,129 (31.7)	579 (19.3)	66,703 (41.5)	160 (12.9)	18,198 (30.6)	505 (17.8)	64,265 (41.1)
6. Sex: Male	3,150 (67.3)	119,051 (48.8)	4,522 (68.2)	176,378 (49.4)	1,901 (63.4)	77,859 (48.5)	716 (57.7)	30,361 (51.1)	1,759 (62.0)	77,343 (49.5)
7. Comorbidity index > 2	797 (17.0)	3,277 (1.3)	817 (12.3)	6,313 (1.8)	368 (12.3)	2,859 (1.8)	205 (16.5)	1,001 (1.7)	444 (15.7)	3,470 (2.2)

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Table 3. Odds ratios of having a risk factor for persons who had a non-fatal overdose compared with persons who did not have an overdose

Risk factor	Unadjusted OR (95% CI)	Adjusted OR (95% CI)*
1. Chronic pulmonary disease	1.77 (1.69 - 1.85)	2.01 (1.92 - 2.11)
2. Diabetes	0.81 (0.76 - 0.86)	1.24 (1.16 - 1.32)
3. Hypertension	0.54 (0.51 - 0.57)	0.98 (0.93 - 1.05)
4. Coronary heart disease	1.15 (1.06 - 1.25)	2.08 (1.92 - 2.27)
7. Elixhauser Comorbidity index† > 2	9.57 (9.16 - 10.00)	18.05 (17.19-18.96)

* Adjusted for age and sex.

† Excluded chronic pulmonary disease, drug abuse, diabetes, and hypertension from the index calculation.