

Enhanced Emergency Department Opioid-related Overdose Surveillance at Interior Health, Island Health and Northern Health: A Descriptive Analysis

Data from 5 June, 2016 to 4 March 2017



Introduction

Following a sudden and sustained increase in both non-fatal and fatal opioid related overdoses in British Columbia, the Provincial Health Officer declared a public health emergency in April 2016. Surveillance of opioid-related overdoses, including emergency department (ED) encounters, is a critical component of the public health response to the crisis. While some information is available through ED electronic records, the ability to extract sufficient contextual information on non-fatal overdose events presenting to ED is limited. Yet, this type of information is useful for informing the types of interventions needed to respond to the situation. In addition, specific identification of opioid-related overdose cases is not always possible through syndromic surveillance of ED encounters. As a result, public health officials in three British Columbia health authorities (Interior, Island and Northern Health) implemented an enhanced surveillance program in hospital and health center EDs.¹ Healthcare providers were asked to complete a case report form for each patient seen in the ED with a known or suspected opioid overdose and provide the information to the local Medical Health Officer.

All case report forms are entered into a secure database at each health authority where the information is reviewed by public health epidemiologists. Database extracts are forwarded each week to the British Columbia Centre for Disease Control (BCCDC) where the files are merged. Staff at the British Columbia Observatory for Population and Public Health analyze the merged data and provide regular reports. This report is intended to provide a descriptive analysis of case reports received to date. An overview of who is affected; along with information about where and when the cases occurred will be provided. The report also provides an overview of a number of self-reported drug use behaviours at the time of the overdose along with information about the type of drugs used.

Key Points

- ED medical staff reported opioid-related overdoses among 1,262 individuals during the nine months under review; 170 (13%) had more than one overdose
- 61% of all patients were between 20 and 39 years of age; 68% were male; 17% had no fixed address
- Cases were reported in 47 communities across the three health authorities
- Information about the frequency of drug use was not provided for 40% of all cases; of those who did respond, 59% reported daily use
- Among those who did respond, 51% indicated they took drugs in a private residence and 32% said they used in a public space
- Information about whether the patient used drugs alone at the time of the overdose was not provided for 32% of all cases; of those who did respond, 37% said they were alone
- Polysubstance use was common; nearly one half of all patients indicating he/she consumed two or more different types of drugs
- Naloxone was administered to treat the overdose in 78% of the cases reported to date
- Data presented in this report should be interpreted with caution. High non-response for some questions makes interpretation challenging
- Data collected may not represent all opioid overdose cases presenting at EDs in the three health authorities

¹ Fraser Health and Vancouver Coastal Health had well established surveillance systems in place that ascertain likely opioid related overdose cases based on systematic searches of discharge diagnosis and key words in their emergency department databases.

Results

Number of Visits

A total of 1,510 reports were received from 47 hospitals and community health centres across the three participating health authorities between June 5, 2016 and March 4, 2017. A total of 582 visits were reported from 18 facilities at Interior Health, 606 visits from 10 facilities at Island Health, and 322 cases from 19 facilities at Northern Health. A number of patients had multiple encounters. Table one shows that 1,262 patients were seen in EDs, 170 (13%) had two or more encounters during the period under review.

Table 1

Number of Patients seen in Emergency Department due to Known or Suspected Opioid Overdose by Number of Encounters & Health Authority: June 5, 2016 to March 4, 2017

	Total		Interior Health		Island Health		Northern Health	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)
Total	1262	100%	502	100%	494	100%	266	99%
One	1092	87%	445	89%	416	84%	231	87%
Two	125	10%	43	9%	59	12%	23	9%
Three	23	2%	7	1%	9	2%	7	3%
Four	14	1%	5	1%	7	1%	2	1%
Five or more	8	0%	2	0%	3	0%	3	1%

Description of Individuals

Sex

Overall, two thirds of the patients were male (68%). Differences between health authorities were noted with 59% of the cases at Northern Health reported to be male compared to 74% at Island Health.

Table 2

Number of Patients seen in Emergency Department due to Known or Suspected Opioid Overdose by Sex & Health Authority: June 5, 2016 to March 4, 2017

	Total		Interior Health		Island Health		Northern Health	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)
Total	1262	100%	502	100%	494	100%	266	100%
Female	402	32%	170	34%	127	26%	105	39%
Male	856	68%	331	66%	367	74%	158	59%
Not provided	4	0%	1	0%	-	-	3	1%

Table 3 provides selected characteristics of female and male patients seen at EDs due to an opioid-related overdose. The two groups were similar. However, among the 1,087 individuals for whom address information was available, males were more likely than females to have no fixed address (20% vs. 12%). And among the 1,283 case reports where information about drug use was available, males were more likely than females to use drugs in public spaces (35% vs. 26%).

Table 3

Number of Patient & Number of Emergency Department Visits due to Known or Suspected Opioid Overdose by Sex & Select Characteristics: June 5, 2016 to March 4, 2017

	Total		Female		Male	
	No.	(%)	No.	(%)	No.	(%)
Total Number of Individuals	1262	100%	402	100%	856	100%
Mean Age (sd.)	35.4	(12.4)	34.2	(13.2)	35.9	(12.1)
Fixed Address						
Fixed address	898	71%	308	77%	588	69%
No fixed address	189	15%	41	10%	148	17%
Not provided/unknown	175	14%	53	13%	120	14%
Total Number of Encounters	1510	100%	464	100%	1042	100%
History of Drug use past 6 months						
Daily	530	35%	139	30%	390	37%
Weekly/Occasionally	370	25%	111	24%	257	25%
Not provided/unknown	610	40%	214	46%	395	38%
Used Drugs Alone						
Yes	378	25%	111	24%	267	26%
No	643	43%	194	42%	448	43%
Not provided/unknown	489	32%	159	34%	327	31%
Location(s) of Drug Use*						
Private residence	659	44%	233	50%	423	41%
Public space/street	415	27%	102	22%	312	30%
Shelter	79	5%	13	3%	66	6%
Hotel	20	1%	7	2%	13	1%
Other Location	134	9%	37	8%	97	9%
Not provided/unknown	223	15%	79	17%	144	14%
Substance(s) used *						
Heroin	752	50%	204	44%	548	53%
Fentanyl	205	14%	61	13%	143	14%
Opioids not prescribed to patient	183	12%	58	13%	124	12%
Other illicit opioid	166	11%	53	11%	113	11%
Opioids prescribed to patient	91	6%	41	9%	50	5%
Methadone	59	4%	21	5%	37	4%
Illicit stimulants	329	22%	109	23%	220	21%
Alcohol	230	15%	78	17%	152	15%
Benzodiazepines	63	4%	28	6%	35	3%
Other drugs	208	14%	72	15%	136	13%
No substance indicated	151	10%	47	10%	102	10%

sd. = standard deviation

* Percentages may add to more than 100% because some patients reported more than one location or substance.

Age

The mean age at the time of ED visit due to opioid-related overdose was 35 years; no significant differences were noted between health authorities. Nearly two thirds of the patients (61%) were between 20 and 39 years of age. Across the three health authorities, 14% of the patients were 50 years of age or older.

Table 4

Number of Patients seen in Emergency Department due to Known or Suspected Opioid Overdose by Patient's Age & Health Authority: June 5, 2016 to March 4, 2017

	Total		Interior Health		Island Health		Northern Health	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)
Total	1262	100%	502	100%	494	100%	266	100%
< 20	74	6%	26	5%	30	6%	18	7%
20 to 29	403	32%	170	34%	139	28%	94	35%
30 to 39	371	29%	134	27%	158	32%	79	30%
40 to 49	225	18%	96	19%	86	17%	43	16%
50 to 59	128	10%	51	10%	60	12%	17	6%
60 +	54	4%	25	5%	17	3%	12	5%
Not provided	7	1%	-	-	4	1%	3	1%
	mean	s.d.	mean	s.d.	mean	s.d.	mean	s.d.
Age in years	35.4	(12.4)	35.7	(12.6)	35.8	(12.3)	34.1	(12.3)

s.d. = standard deviation

Table 5 provides selected characteristics of patients seen at EDs due to an opioid-related overdose by age group. Characteristics were similar for those less than 40 years of age and those 40 years of age and older. However, among the cases reports for which substance use information was available (non-response excluded), younger patients were more likely than older patients to report using illicit stimulants (33% vs. 22%).

Table 5

Number of Emergency Department Visits due to Known or Suspected Opioid Overdose by Age Group & Select Characteristics: June 5, 2016 to March 4, 2017

	Total		< 40 years		40 + years	
	No.	(%)	No.	(%)	No.	(%)
Total Number of Individuals	1262	100%	849	100%	407	100%
Sex						
Female	402	32%	288	34%	112	28%
Male	856	68%	559	66%	295	72%
Not provided	4	0%	2	0%	0	0%
Fixed Address						
Fixed address	898	71%	604	71%	292	72%
No fixed address	189	15%	136	16%	52	13%
Not provided/unknown	175	14%	109	13%	63	15%
Total Number of Encounters	1510	100%	1031	100%	472	100%
History of Drug use past 6 months						
Daily	530	35%	371	36%	157	33%
Weekly/Occasionally	370	25%	251	24%	118	25%
Not provided/unknown	610	40%	409	40%	197	42%
Used Drugs Alone						
Yes	378	25%	246	24%	130	28%
No	643	43%	460	45%	181	38%
Not provided/unknown	489	32%	325	32%	161	34%
Location(s) of Drug Use*						
Private residence	659	44%	447	43%	209	44%
Public space/street	415	27%	285	28%	127	27%
Shelter	79	5%	51	5%	28	6%
Hotel	20	1%	15	1%	5	1%
Other Location	134	9%	91	9%	43	9%
Not provided/unknown	223	15%	156	15%	66	14%
Substance(s) used *						
Heroin	752	50%	522	51%	228	48%
Fentanyl	205	14%	150	15%	54	11%
Opioids not prescribed to patient	183	12%	128	12%	55	12%
Other illicit opioid	166	11%	125	12%	41	9%
Opioids prescribed to patient	91	6%	33	3%	58	12%
Methadone	59	4%	32	3%	27	6%
Illicit stimulants	329	22%	252	24%	77	16%
Alcohol	230	15%	172	17%	58	12%
Benzodiazepines	63	4%	36	3%	27	6%
Other drugs	208	14%	156	15%	51	11%
No substance indicated	151	10%	92	9%	56	12%

Note: Table does not include 6 cases where the individual's age was not provided.

* Percentages may add to more than 100% because some patients reported more than one location or substance.

Patient's Address

Patient's address is captured during registration at triage when the patient enters the ED. Healthcare providers at Island and Northern Health have the option to specify that the patient has no fixed address or the patient's address is unknown on the case report form. This option does not appear on forms at Interior Health where the patient's address is obtained by linking the case report form to the encounter database. If the address information in the administrative data does not reflect the patient's current housing situation this method may underestimate the proportion of patients with no fixed address at Interior Health. Across all sites, the address was unknown for 10% and not provided for 4% of patients. Among the 1,087 individuals where address information was reported, 17% of the patients had no fixed address. Patients seen at Island Health facilities were more likely than those at Interior and Northern Health to have no fixed address (33% versus 1% and 23%, respectively).

Table 6

Number of Patients seen in Emergency Department due to Known or Suspected Opioid Overdose by Fixed Address & Health Authority: June 5, 2016 to March 4, 2017

	Total		Interior Health		Island Health		Northern Health	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)
Total	1262	100%	502	100%	494	100%	266	100%
Fixed address	898	71%	466	93%	292	59%	140	53%
No fixed address	189	15%	4	1%	144	29%	41	15%
Address unknown	123	10%	30	6%	37	8%	56	21%
Not Provided	52	4%	2	0%	21	4%	29	11%

Note: The most recent provided address information was retained and reported for individuals who had multiple encounters.

Description of Emergency Department Encounters

The following section of the report describes characteristics of each ED encounter. As indicated above, a total of 1,510 encounters were reported between June 5, 2016 and March 4, 2017.

Community Where Emergency Department Visit Took Place

Table 7 provides the number of ED visits seen in each community. ED visits due to suspected or known opioid overdose were reported in 18 communities in Interior Health. Just over two thirds of the cases (69%) were reported in three communities: Kamloops, Vernon and Kelowna. Encounters were reported in 19 communities in Northern Health, with nearly three quarters of all cases (74%) occurring in Prince George, Quesnel and Fort St. John. At Island Health, nearly three quarters (74%) of all cases were reported at EDs in two communities - Victoria and Nanaimo.

Table 7

Number of Emergency Department Visits to Known or Suspected Opioid Overdose by Community where ED Visit Occurred & Month: June 5, 2016 to March 4, 2017

	Interior Health		Island Health		Northern Health	
	No.	(%)	No.	(%)	No.	(%)
Total	582	100%	606	100%	322	98%
Vernon	149	26%	-	-	-	-
Kamloops	128	22%	-	-	-	-
Kelowna	124	21%	-	-	-	-
Penticton	65	11%	-	-	-	-
Nelson	43	7%	-	-	-	-
Trail	16	3%	-	-	-	-
100 Mile House	11	2%	-	-	-	-
Merritt	10	2%	-	-	-	-
Oliver	8	1%	-	-	-	-
Grand Forks	6	1%	-	-	-	-
Williams lake	6	1%	-	-	-	-
7 other communities	16	3%	-	-	-	-
Victoria	-	-	289	48%	-	-
Nanaimo	-	-	158	26%	-	-
Duncan	-	-	57	9%	-	-
Campbell River	-	-	43	7%	-	-
Comox	-	-	28	5%	-	-
Port Alberni	-	-	21	3%	-	-
5 other communities	-	-	10	2%	-	-
Prince George	-	-	-	-	171	52%
Quesnel	-	-	-	-	35	11%
Fort St. John	-	-	-	-	31	9%
Dawson Creek	-	-	-	-	21	6%
Chetwynd	-	-	-	-	9	3%
Vanderhoof	-	-	-	-	7	2%
Fort Nelson	-	-	-	-	6	2%
Hazelton	-	-	-	-	6	2%
Prince Rupert	-	-	-	-	6	2%
Terrace	-	-	-	-	5	2%
9 other communities	-	-	-	-	25	8%

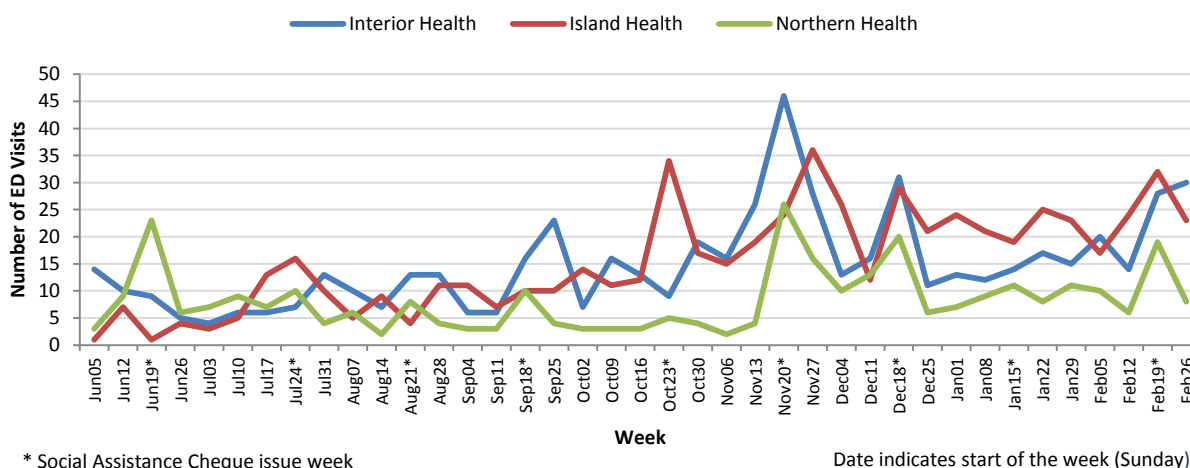
* Number of reported cases less than five – data suppressed to protect confidentiality

Number of Cases by Week

Figure 1 shows the number of reported cases varies from week to week at each health authority. Fluctuations were to some extent associated with the distribution of social assistance cheques near the end of each month. However, it is difficult to determine whether changes observed over time reflect actual changes in the number of cases seen at EDs or whether the fluctuations are artifacts caused by deviations in the completeness of reporting by healthcare providers. There is good evidence at Interior and Island Health that case ascertainment has varied over time and between EDs. For example, the general increase in the number of reported cases at Island Health between August and October can be explained, at least in part, by an increase in the number of facilities reporting to the surveillance system. Island Health phased in the implementation of the enhanced overdose surveillance program across acute care facilities, starting at the largest facilities in Victoria in June with all acute care facilities reporting by September 1st. As a result, interpretation of reported changes over time should be made with extreme caution.

Figure 1

Number of Emergency Department Visits due to Known or Suspected Opioid Overdose by Week Visit Occurred & Health Authority: June 5– November 5, 2016 (n = 1510)



Patient's Intention

Healthcare providers indicated the patient's intention (i.e. whether the overdose was unintentional or intentional) was unknown for 14% of the cases. This information was not provided for another 9% of the cases. When these two categories are excluded, the ED healthcare providers indicated patients unintentionally overdosed in 92% of the cases reported. No differences were observed between health authorities. Often the patient's intention is difficult to ascertain when responding to an immediate crisis. Therefore, these estimates should be interpreted with caution. All case report forms received were included in this analysis regardless of recorded patient intention.

Table 8

Number of Emergency Department Visits due to Known or Suspected Opioid Overdose by Patient's Intention at Time of Overdose & Health Authority: June 5, 2016 to March 4, 2017

Patient's Intention	Total		Interior Health		Island Health		Northern Health	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)
Total	1510	100%	582	100%	606	100%	322	100%
Unintentional	1071	71%	429	74%	473	78%	169	52%
Intentional	88	6%	37	6%	31	5%	20	6%
Unknown/Not Provided	351	23%	116	20%	102	17%	133	41%

History of Drug use in the Previous Six Months

Table 9 provides information about patients' history of drug use during the six months prior to the overdose. The healthcare provider completing the form indicated she/he did not know the patient's history of drug use for 25% of the cases. No answer was recorded for another 15% of the cases. Among the 900 cases where drug use history was reported (non-response excluded), 59% indicated they used drugs daily. The proportion was similar in each of the three health authorities.

Given the high non-response rate (40%), these results should be interpreted with extreme caution. Patients who did not respond to the question may not be similar to those who did. If daily drug users are more easily identified and classified as such on the case report form, the proportion of weekly and occasional drug users will be underestimated. When responders and non-responders to this question were compared by age, sex, fixed address, and number of drugs taken no significant differences were noted. However, responders were more likely than non-responders to report using heroin.

Table 9

Number of Emergency Department Visits due to Known or Suspected Opioid Overdose by History of Drug use past 6 Months & Health Authority: June 5, 2016 to March 4, 2017

	Total		Interior Health		Island Health		Northern Health	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)
Total	1510	100%	582	100%	606	100%	322	100%
Daily	530	35%	214	37%	243	40%	73	23%
Weekly	150	10%	67	12%	62	10%	21	7%
Occasionally	220	15%	98	17%	93	15%	29	9%
Unknown/not provided	610	40%	203	35%	208	34%	199	62%

Location of Drug Use/Overdose

Emergency department healthcare providers were asked to record whether the patient was using the drug in a public space, private residence or other location at the time of the overdose. Providers indicated they didn't know the location for 4% of the cases reported. No response was provided to this question for another 11% of the cases. Among the 1,287 cases for which this information is reported, 32% indicated the patient used the drug(s) in a public space and 51% indicated the drug(s) were used in a private residence. Again, the effect of high levels of non-response for this question should be considered when interpreting results.

Table 10

Number of Emergency Department Visits due to Known or Suspected Opioid Overdose by Location of Drug use/Overdose & Health Authority: June 5, 2016 to March 4, 2017

	Total		Interior Health		Island Health		Northern Health	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)
Total	1510	—	582	—	606	—	322	—
Private residence	659	44%	276	47%	242	40%	141	44%
Public space/street	415	27%	165	28%	176	29%	74	23%
Shelter ¹	79	5%	14	2%	65	11%	-	-
Hotel	20	1%	19	3%	-	-	1	0%
Other Location	134	9%	62	11%	47	8%	25	8%
Unknown/not provided	223	15%	51	9%	86	14%	86	27%

¹ Response option not specified on the Northern Health case report form

Note: Percentages may add to more than 100% because some patients reported using in more than one location.

Used Drug While Alone

Healthcare providers were asked to indicate whether the patient was alone at the time the overdose occurred. In 20% of the cases, the provider indicated he/she did not know this information. No response was provided for another 12% of the forms received. Among the 1,021 cases where this information was recorded, 37% indicated the patient was alone. The high non-response rate (32%) does present some challenges to the interpretation of these results. If non-response is associated with more severe clinical presentation at the ED, and this in-turn is associated with delayed treatment because the patient was alone, the proportion of cases where the patient used alone would be underestimated.

Table 11

Number of Emergency Department Visits due to Known or Suspected Opioid Overdose by Patient Alone at Time of Overdose & Health Authority: June 5, 2016 to March 4, 2017

	Total		Interior Health		Island Health		Northern Health	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)
Total	1510	100%	582	100%	606	100%	322	100%
Yes	378	25%	152	26%	169	28%	57	18%
No	643	43%	289	50%	262	43%	92	29%
Unknown/not provided	489	32%	141	24%	175	29%	173	54%

Substance(s) the Patient used

Healthcare providers were asked to record the substance(s) the patient reported using. Table 12 provides information about how frequently individuals reported using several types of drugs. No substance was recorded on the case report form for 10% of the cases. Among the 1,359 cases for which this information was reported, consumption of opioids only was reported for just over half (54%) of the cases. Use of at least one opioid substance along with another type of non-opioid drug was reported for 30% of the cases.

Only non-opioid drugs were reported in 16% of the cases. Individuals in the latter category may include cases where the patient and/or healthcare provider believed the non-opioid drug (e.g. cocaine) contained an opioid substance. However, it is also possible cases were reported in error; i.e. there was no evidence the substance consumed contained an opioid. Given that opioids are sometimes mixed with other illicit drugs, an unknown proportion of individuals who reported using non-opioid drugs only were possibly naive opioid users. Without reliable recall of consumption histories by patients that is accurately recorded and then linked with toxicology results, it is difficult to estimate the true extent of overdoses due to opioids.

Table 12 also shows 55% patients indicated they took one type of drug which means that 45% said they took two or more different types of drugs. Two or more different types of opioids were recorded in 20% of the cases where only opioid use was reported by the patient. Three or more different types of drugs were recorded in 50% of the cases where at least one opioid substance and another type of drug(s) were reported. Due to the way the question is worded, it is possible that some patients reported general consumption patterns rather than the specific drug(s) consumed at the time of the overdose.

Table 12

Number of Emergency Department Visits due to Known or Suspected Opioid Overdose by Categories of Drug(s) use, Number of Different Drug(s) used as Reported by Patient & Health Authority: June 5, 2016 to March 4, 2017

Category & number of drug types used	Total		Interior Health		Island Health		Northern Health	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)
Total Cases Reported	1510	100%	582	100%	606	100%	322	100%
Opioids only	740	49%	267	46%	321	53%	152	47%
Opioid & other drugs	405	27%	164	28%	150	25%	91	28%
Non-opioid drugs only	214	14%	95	16%	69	11%	50	16%
Not provided	151	10%	56	10%	66	10%	29	9%
Cases reported substance(s)	1359	100%	526	100%	540	100%	293	100%
One type of drug	745	55%	271	52%	326	60%	148	51%
Two types of drugs	393	29%	157	30%	146	27%	90	31%
Three types of drugs	155	11%	68	13%	48	9%	39	13%
4 or more types of drugs	66	5%	30	6%	20	4%	16	5%
Opioids only	740	100%	267	100%	321	100%	152	100%
One type of opioid	589	80%	202	76%	272	85%	115	76%
Two types of opioids	138	19%	59	22%	46	14%	33	22%
Three or more types	13	2%	6	2%	3	1%	4	3%
Opioids & other drugs	405	100%	164	100%	150	100%	91	100%
Two types	201	50%	74	45%	86	58%	41	45%
Three types	142	35%	61	37%	47	31%	34	37%
4 or more types	62	15%	29	18%	17	11%	16	18%
Non-opioid drugs only	214	100%	95	100%	69	100%	50	100%
One type	156	73%	69	73%	54	78%	33	66%
Two types	54	25%	24	25%	14	20%	16	32%
Three types	4	2%	2	2%	1	-	1	2%

Table 13 provides information about the types of drugs reported for each of the drug use categories described above. Caution should be used when interpreting these results. Differences in the case report forms used make it difficult to compare authorities. Heroin and fentanyl are itemized on Interior and Island Health case report forms but were not enumerated on the Northern Health form prior to December 2016. It is likely that heroin and fentanyl were classified as illicit or non-prescribed opioids at Northern Health prior to this change. Moreover, the category “opioids not prescribed to the patient” was removed from the Northern Health form and replaced by a different category “other opioids” and a follow-up question “was the opioid prescribed to the patient” was added. While in theory the categories are similar, it is difficult to determine what if any impact the changes had on how information is recorded.

Among the cases where opioids only were reported, heroin was reported most frequently at Interior and Island Health (73% and 85% respectively). Other illicit opioids were indicated most frequently at

Northern Health (51%). However, when the analysis was restricted to patients who reported consuming opioids only seen at a Northern Health ED between January 1 and March 4, 2017 85% used heroin, 21% took fentanyl, 13% used other illicit opioids and 2% took non-prescribed opioids (n = 48).

Among patients who indicated they had consumed one or more types of opioids along with at least one other type of drug, 59% reported consuming illicit stimulants (includes cocaine and methamphetamines), 39% said they drank alcohol and 13% consumed Benzodiazepines along with the opioid(s). Between January and March 2017, Northern Health patients who took opioids and other drugs reported the following: 59% took heroin, 44% took fentanyl, 15% other illicit opioids and no one indicated taking non-prescribed opioids (n=27). Finally, among those who indicated they consumed non-opioid drugs, illicit stimulants and alcohol were also the most common types of drugs reported (43% and 34% respectively).

Table 13

Number of Emergency Department Visits due to Known or Suspected Opioid Overdose by Categories and Types of Drugs used as Reported by Patient & Health Authority: June 5, 2016 to March 4, 2017

Types of drugs used	Total		Interior Health		Island Health		Northern Health	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)
Total number of cases reported	1510	-	582	-	606	-	322	-
Number of cases opioid(s) only	740	-	267	-	321	-	152	-
Heroin*	525	71%	195	73%	273	85%	57	38%
Fentanyl*	124	17%	60	22%	49	15%	15	10%
Other illicit opioid*	92	12%	8	3%	7	2%	77	51%
Methadone	31	4%	6	2%	19	6%	6	4%
Opioids prescribed to patient	46	6%	22	8%	16	5%	8	5%
Opioids not prescribed to patient	90	12%	48	18%	12	4%	30	20%
Number of cases opioid & other drug(s)	405	-	164	-	150	-	91	-
Heroin*	227	56%	105	64%	105	70%	17	19%
Fentanyl*	81	20%	44	27%	25	17%	12	13%
Other illicit opioid*	74	18%	14	9%	14	9%	46	51%
Methadone	28	7%	6	4%	11	7%	11	12%
Opioids prescribed to patient	45	11%	18	11%	19	13%	8	9%
Opioids not prescribed to patient	93	23%	48	29%	16	11%	29	32%
Illicit stimulants	237	59%	86	52%	93	62%	58	64%
Alcohol	158	39%	68	41%	54	36%	36	40%
Benzodiazepines	51	13%	19	12%	19	13%	13	14%
Other drug	107	26%	50	30%	31	21%	26	29%
Number of cases other drugs only	214	-	95	-	69	-	50	-
Illicit stimulants	92	43%	40	42%	38	55%	14	28%
Alcohol	72	34%	35	37%	17	25%	20	40%
Benzodiazepines	12	6%	4	4%	4	6%	4	8%
Other drug	101	47%	44	46%	27	39%	30	60%
No substance indicated	148	-	56	-	63	-	29	-

Note: Percentages may add to more than 100% because some patients reported using more than one substance.

* Heroin and fentanyl were not enumerated on the Northern Health case report form until late December 2016. Prior to this point, heroin and fentanyl were likely recorded as other illicit opioids or opioids not prescribed to patients.

Administration of Naloxone

Naloxone is an antidote used to block the effects of opioids especially in an emergency situation when the patient is in overdose. When too much opioid is consumed breathing declines dramatically or even stops. Naloxone restores normal breathing preventing death or brain damage due to a lack of oxygen. Among the 1,401 cases for which this information is reported, the medication was given to overdose patients 78% of the time.

Table 14

Number of Emergency Department Visits due to Known or Suspected Opioid Overdose by Naloxone Given to Patient & Health Authority: June 5, 2016 to March 4, 2017

	Total		Interior Health		Island Health		Northern Health	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)
Total	1510	100%	582	100%	606	100%	322	100%
Yes	1087	72%	416	71%	448	74%	223	69%
No	314	21%	121	21%	115	19%	78	24%
Unknown/not provided	109	7%	45	8%	43	7%	21	7%

Among the 1,087 cases given Naloxone, 66% received the medication from Emergency Health Services personnel, and 30% received it at the ED. Overall, 29% of patients who were given Naloxone received it from someone in the community. Differences were noted between health authorities with 35% of patients Island Health receiving Naloxone from a community member compared to 17% at Northern Health (non-response excluded). However, administration by community members has been increasing at Northern Health; from 6% between June 5 and November 5, 2016 (n = 85), to 23% between November 6, 2016 and March 4, 2017 (n=138).

Table 15

Number of Emergency Department Visits due to Known or Suspected Opioid Overdose Given Naloxone by Who Administered Medication & Health Authority: June 5, 2016 to March 4, 2017

	Total		Interior Health		Island Health		Northern Health	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)
Given Naloxone	1087	-	416	-	448	-	223	-
Emergency Health Services	685	63%	282	68%	277	62%	126	57%
Emergency department	313	29%	133	32%	88	20%	92	41%
Community member	307	28%	118	28%	151	34%	38	17%
Unknown/not provided	44	4%	26	6%	16	4%	3	1%

Note: Percentages may add to more than 100% because some patients received multiple doses from various providers.

Conclusion

Results from this descriptive analysis of the enhanced ED surveillance information indicate the majority of individuals seen in the emergency because of an opioid-related overdose were young adults between 20 and 39 years of age. About two-thirds of all patients were male. Among all patients, about one in five had no fixed address. The number of cases reported tends to fluctuate each week, but an increase in cases was often noted during the week social assistance cheques are distributed. Most cases occurred in larger communities, but cases were also reported in smaller communities across the three health authorities. Just over one half of all of those who responded indicated they consumed drugs in a private residence at the time of the overdose; another one third indicated they used drugs in a public space. Among cases for which frequency of drug use was reported, about two-thirds indicated they used drugs daily. Meanwhile, 37% of the individuals who responded to the question indicated they were alone at the time of the overdose. However, high non-response rates for these questions makes interpretation of the result difficult.

Heroin was the most common type of opioid patients reporting consuming at Island Health and Interior Health. Other illicit opioids were indicated most frequently at Northern Health. However, it is important to note that heroin was not itemized on the Northern Health form prior to December 2016. If the Northern Health analysis is restricted to the period after the change in case report forms took place, the types of drugs patients reported using are similar to other health authorities with the majority indicating they took heroin. Poly-substance use was also common with one out of three cases reported taking an opioid along with another non-opioid drug. Illicit stimulants and alcohol was the most common type of non-opioid drug consumed. Three out of four cases were given naloxone to treat the overdose. About two-thirds of those who received naloxone was administered the antidote by Emergency Health Services personnel responding to the crisis.

Limitations

Healthcare providers are expected to complete a case report form each time a known or suspected opioid-related overdose patient is treated in the ED. In the absence of validation studies it is difficult to ascertain the extent to which all patients who meet the case definition are captured in the enhanced surveillance system. Incomplete case finding means the incidence of opioid-related ED encounters will be underestimated. Moreover, variation in case ascertainment over time makes it difficult to interpret trends. Without an evaluation it is difficult to determine whether the cases reported in the enhanced surveillance system are representative of the population of all individuals who experience an opioid-related overdose and present to an ED. This is further complicated by the lack of comparable data for the two largest health authorities, Fraser Health and Vancouver Coastal Health.

Island Health recently developed a syndromic surveillance algorithm that scans ED electronic documentation and identifies suspected opioid-associated overdoses. When results from this case finding approach were compared with case report forms received from the ED, an additional 660 opioid-associated overdose cases were found for the period June 5, 2016 to March 4, 2017. In other words, the

enhanced case reporting system may be underestimating visits to the ED because of an opioid overdose by as much as 50% at Island Health. Moreover, the case report forms included a higher proportion of males compared to syndromic surveillance (78% vs 69% - $p < 0.05$). No significant differences in age group were noted when the two case finding approaches were compared.

Healthcare providers indicated they did not know the answer, or they did not select any of the options presented, in a high proportion of cases for several questions on the case report form. High rates of item non-response make interpretation of these measures problematic. Invalid conclusions may be drawn if patients who responded to these questions were different in some way from those who did not. Item non-response may occur if healthcare providers find it difficult to obtain answers from patients in acute distress. Moreover, several questions on the case report form are specific to various points in the patient's journey through the ED from socio-demographic characteristics collected at triage to an offer of a take home Naloxone kit at discharge. Item non-response may occur if healthcare providers do not use the case report form as a working document over the patient's entire encounter.