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# Overdose Recognition and Response in the BC Take Home Naloxone Program

## Review of data up to July 2016

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## Background

The BC Take Home Naloxone (THN) Program was implemented August 31<sup>st</sup> 2012 and provides training and kit distribution in all of BC's geographic health authorities. Opioid overdose (OD) reversals through community naloxone administration using THN kits have been reported in each health authority. The initial evaluation of the BC THN program, published in 2014, found that clients were more confident responding to overdoses and that naloxone was easy to administer<sup>1</sup>. Challenges identified included reluctance to call 911 during administration events (because of concern of police involvement or a belief that the person would recover) and misconceptions among police regarding naloxone kits.

A follow-up report using data up to March 31 2015 showed satisfaction with THN training<sup>2</sup>. Most THN kits were administered by a person who had been prescribed the kit to another individual. The majority of administrations required only one ampule of naloxone. Rates of severe withdrawal symptoms after naloxone administration were low. Rates of calling 911 were much lower from private residences. Furthermore, when 911 was called, police attended to 45% of overdoses. Additional challenges were flagged such as barriers to checking the overdose victim's airway; common use of unadvised OD responses; and ongoing reluctance to call 911 (due primarily to fear of police involvement).

To further explore factors related to calling 911 during overdoses, the 2015 THN descriptive report was followed by both a qualitative study<sup>3</sup> and an analytic paper<sup>4</sup>. The analysis found it was 10 times more likely for 911 to be called if an overdose occurred on the street vs. in private residences (OR=10.68). The qualitative study demonstrates that the main barrier to calling 911 was concern about being arrested for either (1) outstanding warrants—police collect names of those present at overdose scenes and check for warrants—or (2) illegal activity—such as drug possession or breach of the conditions of probation.

In mid-April 2016—since the 2015 THN report—BC's chief health officer declared a public health emergency in response to high rates of opioid-related OD deaths, due in part to increases in illicit fentanyl use. Similar to the previous two reports, this report is based primarily on data recorded in the "overdose response information" forms (up to July 1<sup>st</sup> 2016). This form has been updated since the 2015 THN report. Information from THN training and dispensing records is also included (up to July 1<sup>st</sup> 2016). This report assesses progress with regard to the previous findings and identifies continuing challenges related to overdose response.

## Evaluation objectives

1. Describe characteristics of administration events.
2. Identify barriers and facilitators to appropriate overdose responses including calling 911.
3. Provide recommendations for program and policy improvements.

<sup>1</sup>Banjo et al. A quantitative and qualitative evaluation of the British Columbia Take Home Naloxone program. *CMAJ Open* (2014), 2(3): E153 - E161. Accessible at <http://cmajopen.ca/content/2/3/E153.full>

<sup>2</sup>Ambrose, G. & Buxton, JA. (2015). *Overdose Recognition and Response in the BC Take Home Naloxone Program*. Vancouver, BC. BC Centre for Disease Control.

<sup>3</sup>Deonarine A, Amlani A, Ambrose G, Buxton JA. Qualitative assessment of take-home naloxone program participant and law enforcement interactions in British Columbia. *Harm Reduction Journal* (2016) 13:17.

<sup>4</sup>Ambrose G, Amlani A, Buxton JA. Predictors of seeking emergency medical help during overdose events in a provincial naloxone distribution programme: a retrospective analysis. *BMJ Open* 2016; 6:e011224.

## Methods

Characteristics of persons receiving overdose prevention, recognition, and response training and kits dispensed are collected on standardised reporting forms which are sent to BCCDC. Following naloxone administration events, naloxone kit holders are asked to complete and return an overdose response information form to the THN program, which comprises questions regarding the individual overdosing or responding, the circumstances of the overdose, naloxone administration, and actions taken in response to overdoses. THN site staff are encouraged to assist in completing the forms with participants when they request a replacement kit, and completed forms are forwarded to BCCDC. All data are entered into the program's MS ACCESS database. Data was extracted from the database to capture program activities and naloxone administration events occurring from August 31 2012 to July 1<sup>st</sup> 2016 (for the most part data from 2012 has been excluded due to a low n of 10). Data is organized by reported location and date of naloxone administration event and when this information is not available, by date of form completion and location of THN site where the overdose response form was filled. Kit holders are also provided opportunity on the overdose response form to provide feedback. Comments and suggestions made from Jan 2015 – Jul 2016 have been categorized (Appendix 1).

## Interpretation of results / limitations

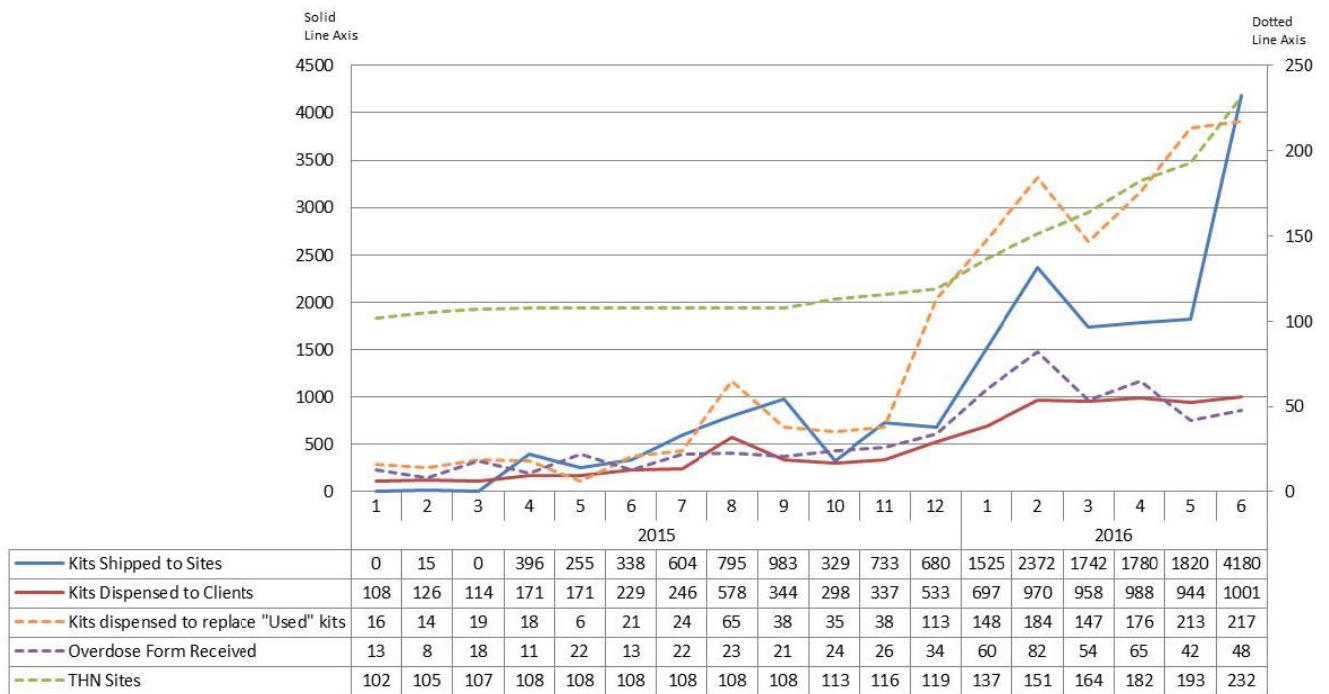
This report is based on reported data. Response rates varied by question; the proportions reported are based on the total responses for a given question unless otherwise indicated. Some response categories contain small numbers of responses; therefore, proportions for these categories should be interpreted cautiously and in conjunction with response numbers which are also presented. Administration event reporting is known to be incomplete, so results may not be representative of all naloxone administration events. For example, as of June 14 2016, 710 overdose response forms were received compared to 1446 kits reported used when a replacement kit was obtained. In addition there are potentially occasions when naloxone is administered and kits are not replaced.

## Results

### Program sites and kits distributed

As of July 1<sup>st</sup> 2016 the THN program has 254 active sites across BC, spread across the five regional health authorities. Thirty two of these sites are emergency departments, three are correctional facilities, and twenty eight are within Indigenous communities. From the program's implementation until July 1<sup>st</sup> 2016 the program has shipped a total 18 547 kits to sites and dispensed 8 813 kits to clients. The number of kits shipped, dispensed and reported used from January 2015 to July 1, 2016 is shown in Figure 1. Table 1 shows the number and type of sites by Health Authority.

**Figure 1: Numbers of Kits shipped, dispensed, replaced as 'used', OD forms received, and THN Sites Enrolled†, BC, January 2015 - June 2016**



\* Kits shipped includes full kits (case, gloves, alcohol wipes, breathing mask, syringes, ampule breakers, response form, sticker with safety steps, and drug) and replacement drug shipments (ampules and breakers only) for anticipated replacement purposes)

†THN Site numbers are the TOTAL number of sites enrolled as of a given month end. All other depictions are additions since the prior month.

**Table 1: Number of active sites in each health authority as of July 1<sup>st</sup> 2016 (n=254)**

	Vancouver Coastal	Fraser Health	Interior Health	Island Health	Northern Health
# sites in Indigenous communities (n=28)	4	3	8	9	4
# correctional facilities (n=3)		2	1		
# emergency departments (n=32)	2	10	11	8	1
# total sites (n=254)	63	42	70	60	19
% of BC total (n=254)	25%	17%	28%	24%	7%

### Naloxone administration events

Figure 2 depicts the distribution by township of the 568 reported naloxone administration events that occurred from Jan 2015 to Jul 2016 through BC’s THN program. Table 2 shows the distribution of these administration events by health authority. Events are distributed widely throughout BC with 34% of total events in Vancouver and 19% in Surrey (with the next highest location being Maple Ridge at 7%).

**Table 2: Reported naloxone administration events through THN program by health authority (Jan 2015 – Jul 2016)**

	Vancouver Coastal	Fraser Health	Interior Health	Island Health	Northern Health
<b>naloxone administration events (n=568)</b>	205	173	84	69	37
<b>% of total events</b>	36%	30%	15%	12%	7%

## Fentanyl

Table 3 presents the number of cases where fentanyl was reportedly used by the person experiencing the overdose. Percentages are based on the total amount of naloxone administration events where the use of at least one specific substance was reportedly used by the person experiencing the overdose. Percentage of reported fentanyl use has greatly increased over the last 3 years.

**Table 3: Overdoses where fentanyl was reportedly used (total n=641)**

	# cases specific substance Reported	# cases fentanyl reported	% cases fentanyl reported
<b>2014</b>	94	16	17%
<b>2015</b>	225	76	34%
<b>2016 (Jan-Jul)</b>	292	124	42%

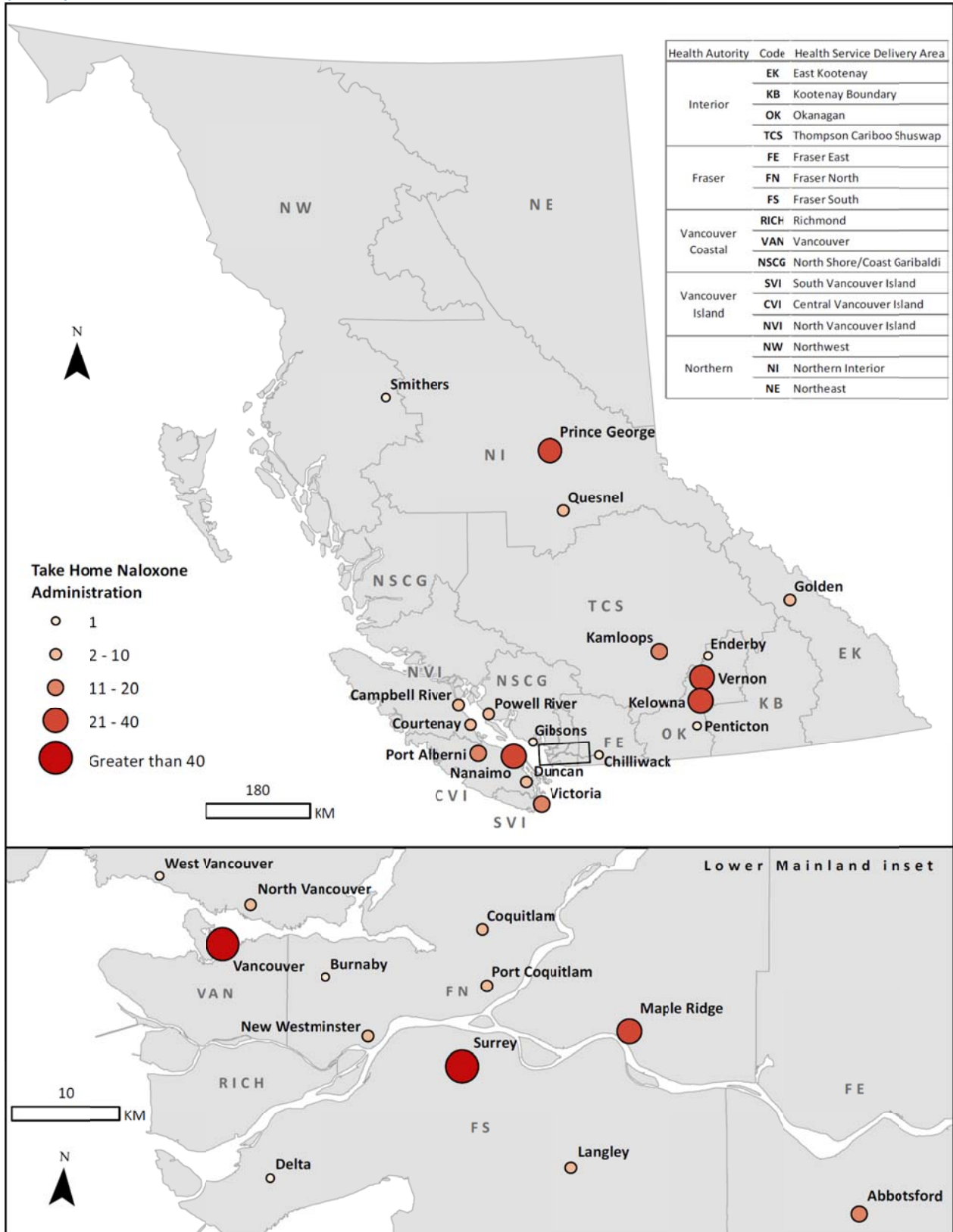
## Number of naloxone ampules administered (0.4mg naloxone in each)

Since March 2, 2016, in response to feedback from review of the administration data and input from the Community Advisory Board input, all new kits shipped to THN sites are supplied with three instead of two naloxone ampules. Table 4 presents the number of ampules administered per naloxone administration event. The mean number of ampules administered has increased from 1.3 (2014) to 1.6 (2015) to 1.8 (2016). The number of events at which only one ampule was administered has decreased from 67% of total events (2014) to 44% (2015) to 36% (2016). Three ampules or more were reportedly administered 13% of the time in 2016, 5% of the time in 2015, and not at all in 2014.

**Table 4: # naloxone ampules administered per overdose event by year (total n=593)**

	1 ampule	2 ampules	3 ampules	4 ampules	5 ampules	Total events
<b>2014</b>	61 (67%)	30 (33%)				91
<b>2015</b>	99 (44%)	114 (51%)	4 (2%)	5 (2%)	1	223
<b>2016 (Jan – Jul)</b>	100 (36%)	143 (51%)	24 (9%)	11 (4%)	1	279

Figure 2: Administration events reported through the THN program from Jan 2015 – Jul 2016 by township (n=568)





## Withdrawal symptoms

The THN overdose response form was updated in May 2015 to include the category of “moderate withdrawal symptoms”. Table 5 shows reports since that time; 72% of reported naloxone administration events resulted in no or mild withdrawal symptoms, with 9% reporting severe withdrawal.

**Table 5: Withdraw symptoms reported after naloxone administration, Jun 2015 – Jul 2016 (n=163)**

	no. responses	% responses
<b>none</b>	44	27%
<b>mild</b>	74	45%
<b>moderate</b>	30	18%
<b>severe</b>	15	9%

## Rates of calling 911

Rates of calling 911 in the context of reported overdose events have changed over time. Table 6 demonstrates overall increased rates of 911-calling from 2013 to 2016. Table 7 demonstrates that 911 was less likely to be called when overdoses occurred in private residences (including “private residence” and “hotel”) compared to those occurring on the street or in other locations.

**Table 6: Rates of calling 911 by year (total n=687)**

	no. OD reports	no. call 911	% call 911
<b>2013</b>	46	16	35%
<b>2014</b>	97	49	51%
<b>2015</b>	233	163	70%
<b>2016 (Jan – Jul)</b>	311	198	64%

**Table 7: Rates of calling 911 by overdose setting, Jan 2015 – Jul 2016 (total n = 513)**

	no. OD reports	no. call 911	% call 911
<b>private</b>	216	99	46%
<b>street</b>	115	93	81%
<b>other (including shelters)</b>	182	154	85%

Table 8 shows the variation of calling 911 between and within health authorities. From Jan 2015 to July 2016, 911 was called in Vancouver Coastal and Fraser Health 79% and 77% of the time respectively, while Northern Health, Island Health, and Interior Health had overall rates below 60%. Among cities reporting 10 or more naloxone administration events, Vernon, Nanaimo, and Abbotsford had the lowest rates within their respective health authorities between Jan 2015 and Jun 2016). Similar to the 2015 report,



Table 8: Rates of calling 911 by health authority and by cities with greater than 10 OD reports, Jan 2015 – Jul 2016 (total n=544)

	no. OD reports	no. call 911	% call 911
<b>Vancouver Coastal</b>	<b>200</b>	<b>157</b>	<b>79%</b>
Vancouver	191	156	82%
<b>Fraser Health</b>	<b>166</b>	<b>127</b>	<b>77%</b>
Maple Ridge	35	33	94%
Surrey	103	78	76%
Abbotsford	15	9	60%
<b>Northern Health</b>	<b>34</b>	<b>20</b>	<b>59%</b>
Prince George	31	18	58%
<b>Island Health</b>	<b>61</b>	<b>27</b>	<b>44%</b>
Victoria	17	10	59%
Port Alberni	15	6	40%
Nanaimo	20	7	35%
<b>Interior Health</b>	<b>83</b>	<b>30</b>	<b>36%</b>
Kelowna	29	14	48%
Kamloops	11	7	64%
Vernon	36	8	22%

### Reasons indicated why 911 was not called

Table 9 shows reasons reported for not calling 911 during overdose events between Jan 2015 and Jul 2016. A specific reason why 911 was not called was noted in 145 forms. The top three reasons were (1) thinking the situation was controlled without emergency services, (2) fear of police attendance, and (3) lack of a phone. In the comments section of OD response form, six people stated that access to a phone would help them better respond to an overdose. Ten reports state that the person who overdosed refused to have 911 called; five reports explain that the person was brought to hospital by a party other than emergency services; in three reported cases the person who had overdosed left the scene after awakening; one report stated that a bystander discouraged calling 911; one report indicated concern about ambulance cost; and one report described not wanting to put parents through stress. The sum of percentages is greater than 100% because 14 reports indicated two separate reasons for not calling 911.

Table 9: Reasons indicated why 911 was not called Jan 2015 – Jul 2016 (total n of events=145)

	no. OD reports	% OD reports
situation thought controlled	68	47%
fear of police	55	38%
no phone	15	10%
other specific reason	21	14%

Table 10: Police attendance, by health authority, when 911 called, Jan 2015 – Jul 2016 (n=193)

	attended	not attended	% attended
<b>Vancouver Coastal</b>	<b>24</b>	<b>58</b>	<b>29%</b>
<b>Fraser Health</b>	<b>43</b>	<b>24</b>	<b>64%</b>
<b>Island Health</b>	<b>11</b>	<b>4</b>	<b>73%</b>
<b>Interior Health</b>	<b>11</b>	<b>4</b>	<b>73%</b>
<b>Northern Health</b>	<b>13</b>	<b>1</b>	<b>93%</b>
<b>Total</b>	<b>102</b>	<b>91</b>	<b>53%</b>

## Police attendance

When 911 was called, 193 forms indicated whether or not the police attended. Table 10 shows rates of police attendance by health authority. Vancouver Coastal had a much lower rate of police attendance than other health authorities. Vancouver Island, Interior Health, and Northern Health all had rates of police attendance above 70%.

## Harassment by emergency services

When asked if the person administering naloxone felt harassed by first responders, 31 replied “yes” (of a total number of 243 specific responses), 13% of reports (Jan 2015-Jul 2016). Of those who responded “yes”, 15 reported harassment by police, 8 by ambulance, 4 by fire service, and 8 did not specify the specific service. Seven reports of harassment describe harassment from more than one service. In the comments section of the THN form, five people wrote that more support and less antagonism from first responders and 911-phone-support would help them better respond to overdoses.

## Which emergency responder arrived first?

In March 2015, THN administration forms were updated to include questions related to the order of arrival of first responders. Table 11 depicts findings from March 2015 to Jul 2016. In every health authority, each service arrives first some of the time. Ambulance services arrive first most often in Interior, Vancouver Coastal, and Island Health; Fraser Health has higher proportions of fire services arriving first; and both police and fire services arrive first frequently in Northern Health. Police also arrive first quite often in Island health, and Fire similarly in Vancouver Coastal Health.

**Table 11: # and % of who arrived first to each naloxone administration event, Mar 2015 – Jul 2016 (total n=252)**

	Ambulance	Fire	Police
Fraser Health	28 (29%)	<b>62 (63%)</b>	8 (8%)
Interior Health	<b>13 (68%)</b>	4 (21%)	2 (11%)
Northern Health	2 (14%)	<b>6 (43%)</b>	<b>6 (43%)</b>
Vancouver Coastal	<b>60 (58%)</b>	<b>35 (34%)</b>	8 (8%)
Island Health	<b>10 (56%)</b>	2 (11%)	<b>6 (33%)</b>
<b>Total</b>	<b>113 (45%)</b>	<b>109 (43%)</b>	30 (12%)

## Time for ambulance to arrive

Another question was added to THN administration forms in May 2015 to determine the estimated length of time for an ambulance to arrive after calling 911. These results are displayed in Table 12. When 911 is called from naloxone administration events, ambulance reportedly arrive within 6-15min most often. However, ambulance reportedly took longer than 15min to arrive in 14% of cases across BC (and with similar rates within major cities).

Table 12: reported length of time for ambulance to arrive, May 2015 – Jul 2016  
(total n=224; percentages are provided for cities with n greater than 20)

	5 or less	6-15	16-30	over 30
Abbotsford	1	3	1	
Campbell River	1		1	
Coquitlam	1			
Delta		1		
Enderby				1
Kamloops		3		
Kelowna	2	5		
Langley			1	
Maple Ridge	5 (19%)	15 (56%)	7 (26%)	
Nanaimo	2	1	2	
New Westminster		1		
Port Alberni	2			
Port Coquitlam	1		1	
Prince George	1	12	1	
Surrey	15 (37%)	21 (51%)	5 (12%)	
Vancouver	33 (34%)	53 (55%)	8 (8%)	2 (2%)
Vernon	1	6		1
Victoria	2	5		
<b>Total</b>	<b>67 (30%)</b>	<b>126 (56%)</b>	<b>27 (12%)</b>	<b>4 (2%)</b>

## Key Findings and associated Recommendations

The following findings are based on THN administration forms reporting overdose events from Jan 2015-Jul 2016 unless dates otherwise specified.

- The number of naloxone kits shipped to sites per month has increased to a peak of over 4,000 kits in June 2016. The disparity between kits shipped and kits dispensed has also increased; some of this may be due to delays related to receiving dispensing forms. *Figure 1.*

**Recommendation: encourage sites to return dispensing forms in a timely manner**

- Naloxone was administered through the THN program in all regions of BC, with the largest numbers in Vancouver and Surrey (34% and 19% respectively). *Figure 2.*
- The reported number of naloxone ampules used per overdose has increased over time alongside increases in reported fentanyl detection and increased number of ampules placed in kits to 3 per new kit since March 2, 2016 (Jan 2014-Jul 2016). *Table 4.*

**Recommendation: continue to provide 3 ampules per kit**

- 72% of reported naloxone administrations resulted in no or mild withdrawal symptoms, with 9% reporting severe withdrawal (Jun 2015-Jul 2016). *Table 5.*

**Recommendation: provide evidence based information to providers and clients regarding low incidence of withdrawal symptoms following community naloxone administration**

- Many valuable suggestions have been provided on administration forms (Appendix 1).

**Recommendation: utilize comments to reassess/improve THN program.**

### Calling 911

- Reported rates of calling 911 have increased over time (Jan 2013-Jul 2016). *Table 6.* This increase reflects the increase in deaths and fentanyl detection reported by BC Coroners Office<sup>1</sup> and an increased emphasis to call 911 in the overdose training.

**Recommendation: during THN training continue to emphasis importance of calling 911**

- Reported rates of calling 911 vary by health authority, Northern, Island, and Interior Health had rates less than 60%. *Table 7.* Island, Interior and Northern Health had reported police attendance rates above 70%, while Vancouver Coastal (where Vancouver Police Department has a policy of not routinely attending 911 calls)<sup>2</sup> has a rate of 29%. *Table 10.* In general, health authorities with higher rates of police attendance have lower rates of 911-calling.

**Recommendation: support efforts to reduce police attendance at overdose events and raise public awareness where policies are in place for police to not routinely attend**

- Reported rates of calling 911 vary within HAs, with Vernon (22%), Nanaimo (35%), and Abbotsford (60%) having relatively low rates within their HAs. *Table 7.*

**Recommendation: target areas of low rates of 911-calling**

<sup>1</sup> Statistical reports into BC fatalities. Drug and Alcohol. Accessed July 16, 2016 available at <http://www2.gov.bc.ca/gov/content/safety/public-safety/death-investigation/statistical-reports>

<sup>2</sup> Vancouver Police Department Planning and Research Section. Amendments to the Regulations and Procedures Manual (2006)

- Reported rates of calling 911 are lower when overdoses take place in private residences (46%) versus in the street (81%). *Table 8*. Possible reasons are concern of arrest, with private settings more challenging to flee, presence of illicit substances and concern about the address being flagged.<sup>3</sup>
- A common reason for not calling 911 was thinking the situation was controlled. *Table 9*.  
**Recommendation: during training continue to emphasis importance of calling 911 as the effects of naloxone wear off after 30 minutes and the overdose may return.**
- Another reported barrier to calling 911 was lack of a phone. *Table 9*.  
**Recommendation: explore provision of unwanted/inactivated cellphones for emergency 911 calls to distribute to THN trainees without a phone.**
- Fear of police attendance is a major barrier to calling 911. *Table 9*.  
**Recommendations:**
  - 1. Discuss wording used when calling 911 to minimize police attendance** i.e. state someone is not breathing or is unconscious rather than someone has overdosed
  - 2. Support efforts to decrease arrests at the scene of an overdose**, for example:
    - i) BC Emergency Health Services not routinely calling police to all overdoses; ii) Police not recording names at OD scenes; iii) ‘Good Samaritan Law’ to provide immunity from drug possession charges during ODs<sup>4</sup> iv) potential for decriminalization of minor drug offences and movement towards regulated markets<sup>5</sup>
  - 3. Involve police in THN training; clarify local policies regarding attendance and arrest for possession. Share rates of arrest reported by police at overdose events**
- One responder reported concern about ambulance cost was a barrier to calling 911.  
**Recommendation: explain that ambulance is free for those on income assistance etc.**
- 13% of reports describe harassment by first responders (to the person administering naloxone), and of these reports, police are the most commonly involved service.  
**Recommendation: overdose and anti-stigma training for emergency responders**
- Fire arrives first most often in Fraser Health; in Northern both fire and police arrive first more frequently than ambulance (Mar 2015 – Jul 2016). *Table 11*.  
**Recommendation: all emergency responders should be able to administer naloxone, especially the services that commonly arrive first in their region.** In January 2016 BC Emergency Health Services announced all paramedics and fire departments who sign an agreement could carry naloxone<sup>6</sup>
- Ambulance reported to take over 15min in 14% of events (May 2015 – Jul 2016). *Table 12*

<sup>3</sup> Deonarine A, Amlani A, Ambrose G, Buxton JA. Qualitative assessment of take-home-naloxone program participant and law enforcement interactions in British Columbia. *Harm Reduction Journal* (2016) 13:17

<sup>4</sup> Bill C-224 Good Samaritan Drug Overdose Act. An Act to amend the Controlled Drugs and Substances Act. In committee June 3, 2016

<sup>5</sup> Csete et al. Public health and international drug policy. *Lancet*(2016) 387: 1427-80

<sup>6</sup> Fire rescue crews to carry naloxone for drug overdose patients Jan 28, 2016. <http://www.bcehs.ca/about/news-stories/news-roll/fire-rescue-crews-to-carry-naloxone-for-drug-overdose-patients>

## Appendix 1: Comments/recommendations (Jan 2015-Jul 2016)

\*Numbers below represent number of filled overdose response forms that contain the stated comment.

### Recommended changes to kit:

- Pre-loaded syringes (difficult to load syringe; ampule broke/difficult; liquid wasted): 34
- Better masks (difficult to ventilate through): 11
- More ampules per kit / allowed to possess more than one kit (if individual needs more naloxone or if two or more people OD simultaneously): 11 (6 of these comments since three ampules/kit)
- Cellphone or 911-signalling device: 6
- Kit to test for contaminants such as fentanyl before using: 1
- Scissors (to get through thick clothing): 1
- Hand sanitizer: 1
- Finger oxygen saturation and heart rate monitor: 1
- Smaller (pocket-sized) kit: 1
- Belt loop (for ease of carrying): 1

### Recommendations for THN training:

- Emphasize informing others: tell others where you keep your kit, teach others to call 911 and how to use kit; have a sign that you have a kit and a sign describing where it is: 11
- Provide training refresher(s): 7
- Prioritize training for staff who work in settings with high OD risk (ie. shelters, SROs): 6
- Advise keeping kit with you at all times: 5
- More practice administering during training (maybe with a dummy): 2
- Emphasize attempting to stay calm/focused while responding to OD: 2
- Emphasis telling others you are using, as you cannot usually use kit on yourself: 1
- Advise calling for help when OD discovered: 1
- Emphasize checking for hazards (ie. dirty needles): 1
- Emphasize replacing used kits: 1
- Information on how many ampules can be safely administered: 1
- Information on how to respond when someone goes into a seizure: 1
- Clearer description of blue lips (not dramatically blue): 1
- It can be effective to use something cold to shock client awake: 1

### General Comments

- Kits / refills / training easier to access / better advertised: 14
- Naloxone available to more people (ie. family / friends / everyone): 8
- More support (and less judgment) from ambulance / police / 911-phone support: 5
- More education for first responders and the public regarding the importance of breaths during suspected opioid OD (and the futility of chest compressions): 2
- More public education on how to use naloxone: 2
- Ambulance took too long: 1
- Initial dose is too weak: 1
- Access to post-event counselling: 1
- Add the word “Narcan” to naloxone posters as not everyone recognizes “naloxone”: 1
- Recalling the OD for the overdose response form was re-traumatizing: 1