A Response to Illicit Drug Overdoses:

Naloxone Administration in Surrey and Vancouver, British Columbia

Martha Dow, Katherine Watson, William Dick, John McKearney, Len Garis, Larry Thomas, and Alex Tyakoff

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SCHOOL OF CRIMINOLOGY & CRIMINAL JUSTICE

Executive Summary

The administration of naloxone by fire first responders was initiated in Vancouver and Surrey in response to increasing opioid related overdose incidents along with the inability of first responders' to administer an antidote treatment. The naloxone administration protocol was implemented in February 2016 and this study discusses the experiences to date in both cities. Overall, the initial training and subsequent follow-up was favourably received by members and prepared them for administering naloxone in overdose situations. This study examines, within the current context, lessons learned and opportunities for future engagement with members to support, at the highest level possible, proactive approaches to pre-hospital patient care. Given the current context, fire first responders represent a crucial aspect in any opioid overdose response.

Prior to the opioid crisis, fire first responders were restricted to basic paramedical protocols for life-saving interventions such as oxygen administration, auto defibrillators, and cardiopulmonary resuscitation (CPR). In an effort to address the provincial opioid crisis, British Columbia Emergency Health Services (BCEHS) trained fire first responders in Surrey and Vancouver to administer the opioid overdose reversing drug "Naloxone" via intramuscular injection. This study reviewed the training process and efficacy of fire first responders utilizing intramuscular injection protocols to administer life-saving overdose drugs. The evidence for this study was gathered through quantitative and qualitative approaches. Naloxone administration training was well-received and fire first responders easily adapted to the new paramedical protocol of administering intramuscular injections. Fire first responders in Surrey and Vancouver successfully reversed over 240 opioid overdoses in 2016.

Introduction

The Surrey Fire Service (SFS) and Vancouver Fire and Rescue Services (VFRS) trained their firefighters in the delivery protocol of naloxone injections to opioid overdose patients. The new training undertaken by these two fire departments was necessary for the licensing of firefighters to administer intermuscular injections. In most of these incidents fire first responders are at the patient's side for a considerable amount of time, providing an important opportunity to reverse the overdose. This initiative is also a response to dramatic increases, in these two cities and across Canada, in the number of deaths and injuries associated with illicit drug use and more specifically, fentanyl.

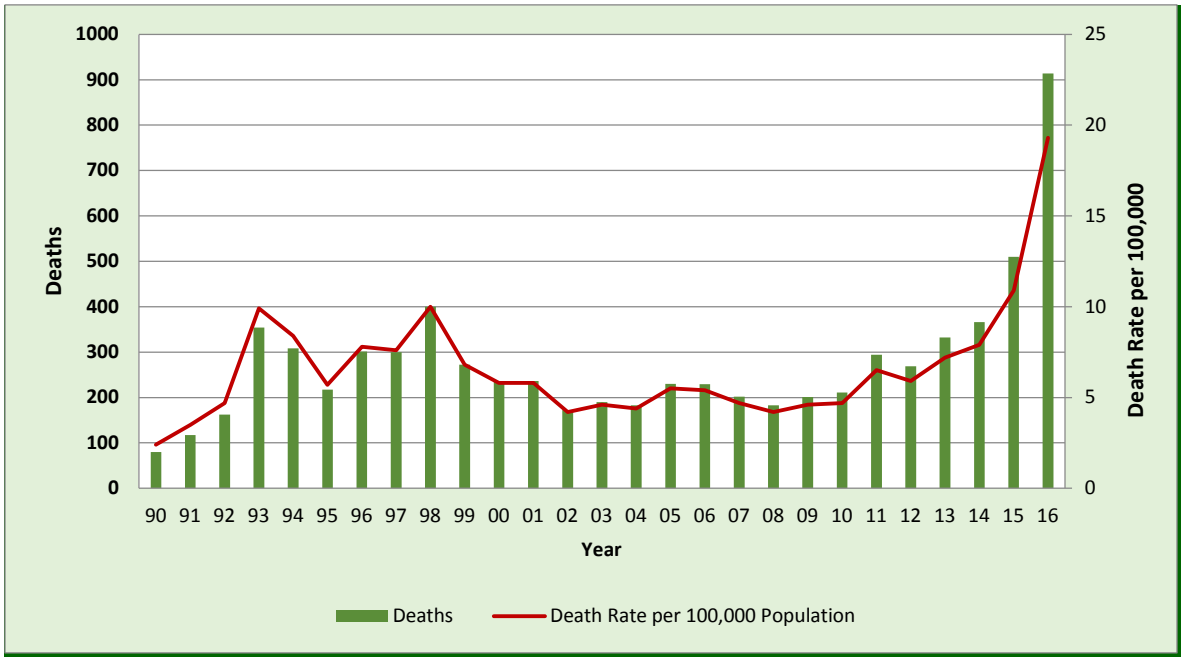
The Canadian Drug Policy Coalition (2013) noted that "with only a few provinces actively reporting overdose fatalities, it is difficult to gauge the extent of opioid related overdose deaths and injuries across Canada. What we do know is that non-prescription opioid related deaths have risen sharply and are estimated to be about 50 percent of annual drug deaths".[1] Nationally, "between 2009 and

[1] Canadian Drug Policy Coalition (2013) Opioid Overdose Prevention and Response in Canada http://drugpolicy.ca/wp-content/uploads/2013/01/CDPC_OverdosePreventionPolicy_Final_July2014.pdf

2014, there were at least 655 deaths where fentanyl was determined to be a cause or a contributing cause".[2]

Provincially, a new record high in illicit drug overdose deaths was recorded in December 2016 with 142 deaths. This number was only seven less deaths than the previous four months of December combined (149).[3] Chart 1 indicates that between 1990 and 2016 the number of illicit drug overdose deaths has increased from 80 to 914 representing a per capita increase of 1043%. In an acknowledgement of this burgeoning problem, the federal government recently committed $10 million to British Columbia (BC) to immediately assist in addressing the alarming overdose numbers in the province.

Chart 1: Illicit Drug Overdose Deaths and Death Rate per 100,000 Population in BC: 1990 to 2016[4]



According to the BC Coroner, fatal illicit drug overdoses from 2007 to 2016 were highest in Vancouver and Surrey with Vancouver moving from 59 to 215 deaths and Surrey's numbers increasing from 22 to 108 deaths.[5] In Surrey, between February 1, 2016, and January 31, 2017, there were 77 naloxone injections. During that same time period, in Vancouver there were 169 naloxone deliveries.

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[2] Canadian Centre on Substance Abuse. Deaths Involving Fentanyl in Canada, 2009-2014.
http://www.ccsa.ca/Resource%20Library/CCSA-CCENDU-Fentanyl-Deaths-Canada-Bulletin-2015-en.pdf

[3] BC Coroners Service. (2017). Illicit Drug Overdose Deaths in B.C., January 1, 2007-December 31, 2016.
http://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/death-investigation/statistical/illicit-drug.pdf

[4] BC Coroners Service. (2017). Illicit Drug Overdose Deaths in B.C., January 1, 2007-December 31, 2016.
http://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/death-investigation/statistical/illicit-drug.pdf

[5] BC Coroners Service. (2017). Illicit Drug Overdose Deaths in B.C., January 1, 2007-December 31, 2016.
http://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/death-investigation/statistical/illicit-drug.pdf

INTENT OF STUDY

The aim of this study is to examine the current situation in Surrey and Vancouver from a fire first responders' perspective within a broader provincial and national context. The purpose of this study is to discuss the role of fire first responders in combatting opioid overdoses by examining the characteristics of these incidents, the role of fire first responders in the pre-hospital system of care, the readiness of fire first responders to respond to overdose and administer naloxone, and the challenges and opportunities associated with this response.

The Dangers of Fentanyl Use

Fentanyl is a synthetic opioid that is up to 100 times more toxic than other narcotics. Most recent cases of fentanyl-related harm, including overdoses and deaths in BC are linked to the illicit market in opioids. Fentanyl is sometimes added to heroin to increase its effects, or mixed with adulterants and diluents and sold as heroin. Many users believe they are purchasing heroin and have no knowledge of the presence of fentanyl. Fentanyl has been showing up in liquid, powder, and pill form, and can be masked in virtually any consumable product putting first time users or those who may mistakenly use fentanyl thinking it is something else at particularly high risk.

An opioid overdose happens when a person takes an amount of a drug that is more than the body can process. The risk of overdose is higher when a person takes opioids in combination with other drugs such as heroin. When the opioid drug overwhelms the body, the central nervous system is not able to control basic life functions like breathing and body temperature, and loss of consciousness occurs. In the case of an overdose, an individual's breathing drops below 10 to 12 breaths per minute. Insufficient oxygen can result. Without enough oxygen, the heart will stop beating and the individual will die. Though death can occur within minutes of taking an opioid, more often there is a longer period of unresponsiveness lasting up to several hours. Immediate medical intervention and intramuscular injection protocols to administer life-saving overdose drugs is crucially important.

Fentanyl was first detected in an overdose death in Vancouver in 2012. Since then, the BC Coroners Service has tracked its rise as a factor in drug overdoses in the province. Over the past three years there has been a progressive, province-wide increase in the number of illicit drug overdose deaths in which fentanyl is detected, either alone or in combination with other drugs. Of increasing concern to BC health authorities and fire first responders is the availability of next-generation opioid analogues such as carfentanyl and W-18 which are, by all accounts, significantly more powerful than fentanyl. In December 2016, police and health authorities confirmed the presence of W-18 along with a new and unknown fentanyl analogue in street drugs in Surrey and Vancouver. The role of fire first responders is vitally important in addressing this issue in the two cities.

Discussion

ILLICIT DRUG OVERDOSES

There is no debate regarding the urgent, growing and complicated nature of the illicit opioid overdose problem. Globally, "overdose is the leading cause of preventable death among people who inject drugs".[6] In British Columbia, the numbers continue their upward trajectory with a 79% increase in overdose deaths in 2016 over 2015.[7] The total number of overdose incidents in Surrey increased by 63% from 1606 in 2015 to 2623 in 2016 (Table 1). In Vancouver during that same period, the number of overdoses reported increased from 2536 to 4683, representing an 85% increase (Table 2).

Table 1: Surrey Fire Overdose Statistics: 2015 and 2016

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
2015	129	123	92	130	122	121	140	152	120	136	166	175	1606
2016	234	205	215	234	208	213	233	178	158	201	278	266	2623

Table 2: Vancouver Fire Overdose Statistics: 2015 and 2016

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
2015	180	138	174	195	173	210	217	264	231	236	260	258	2536
2016	255	281	258	276	250	305	310	329	373	508	745	793	4683

The average number of overdoses per day in Surrey rose from 4.2 in January 2015 to 8.6 in December 2016. In Vancouver, the average number of overdoses rose from 5.8 to 25.6 per day during the same time period. These numbers represent an 85% increase in Vancouver and a 63% increase in Surrey. Maps 1 and 2 represent the location of the overdoses in Vancouver and Surrey and the incidents at which fire first responders administered naloxone. While there are some clusters in each city that need to be addressed, there are no geographic boundaries to this problem as all areas of these jurisdictions have been impacted. Based on the location of overdoses occurring everywhere in both cities, the opportunity for fire first responders to arrive quickly and administer the naloxone injection is significant.

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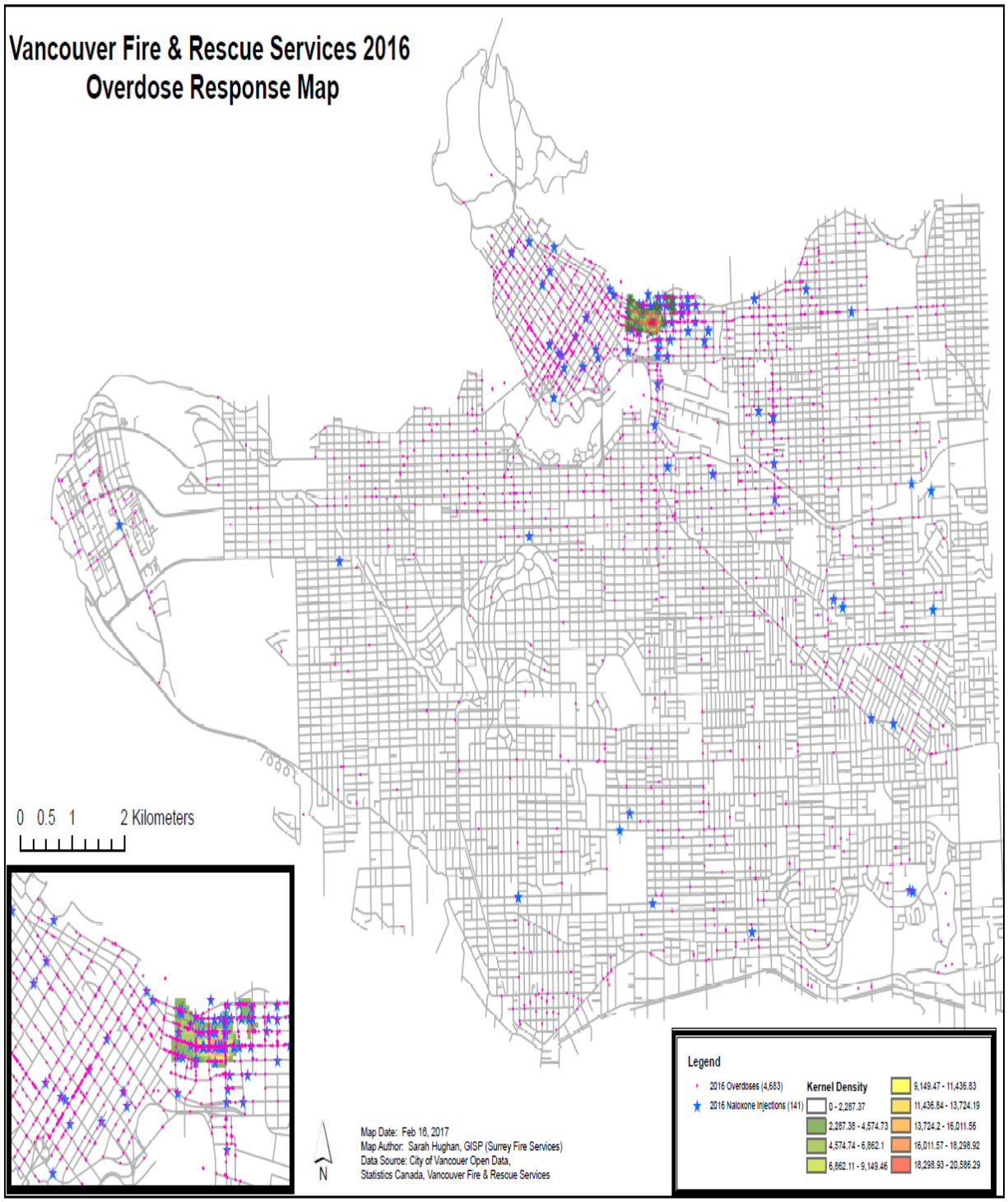
[6] Canadian Centre on Substance Abuse. Deaths Involving Fentanyl in Canada, 2009-2014.
http://www.ccsa.ca/Resource%20Library/CCSA-CCENDU-Fentanyl-Deaths-Canada-Bulletin-2015-en.pdf

[7] BC Coroners Service. (2017). Illicit Drug Overdose Deaths in B.C., January 1, 2007-December 31, 2016.
http://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/death-investigation/statistical/illicit-drug.pdf

Map 1: Clustering of Vancouver Overdoses and Naloxone Administration: 2016



Map 2: Clustering of Surrey Overdoses and Naloxone Administration: 2016

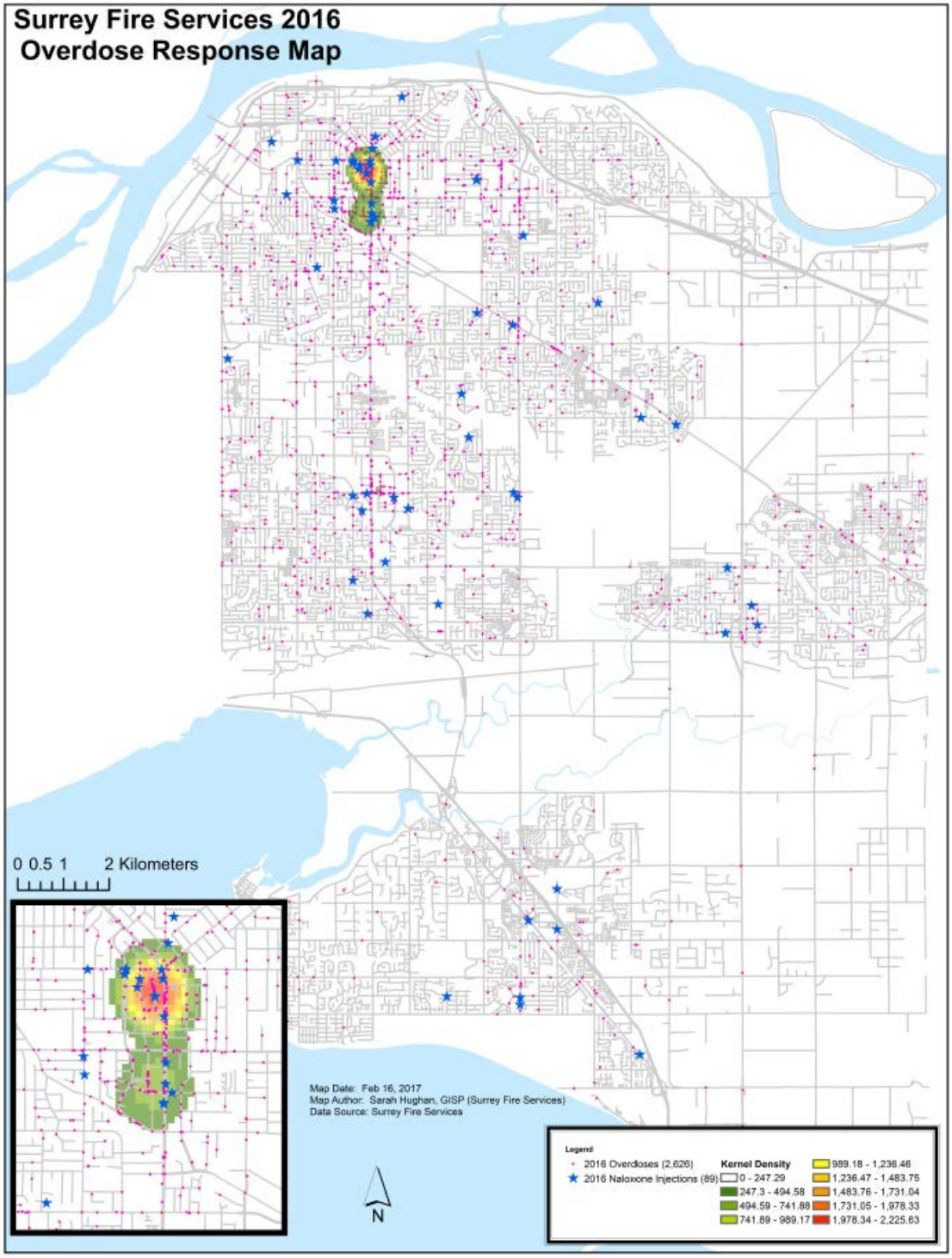
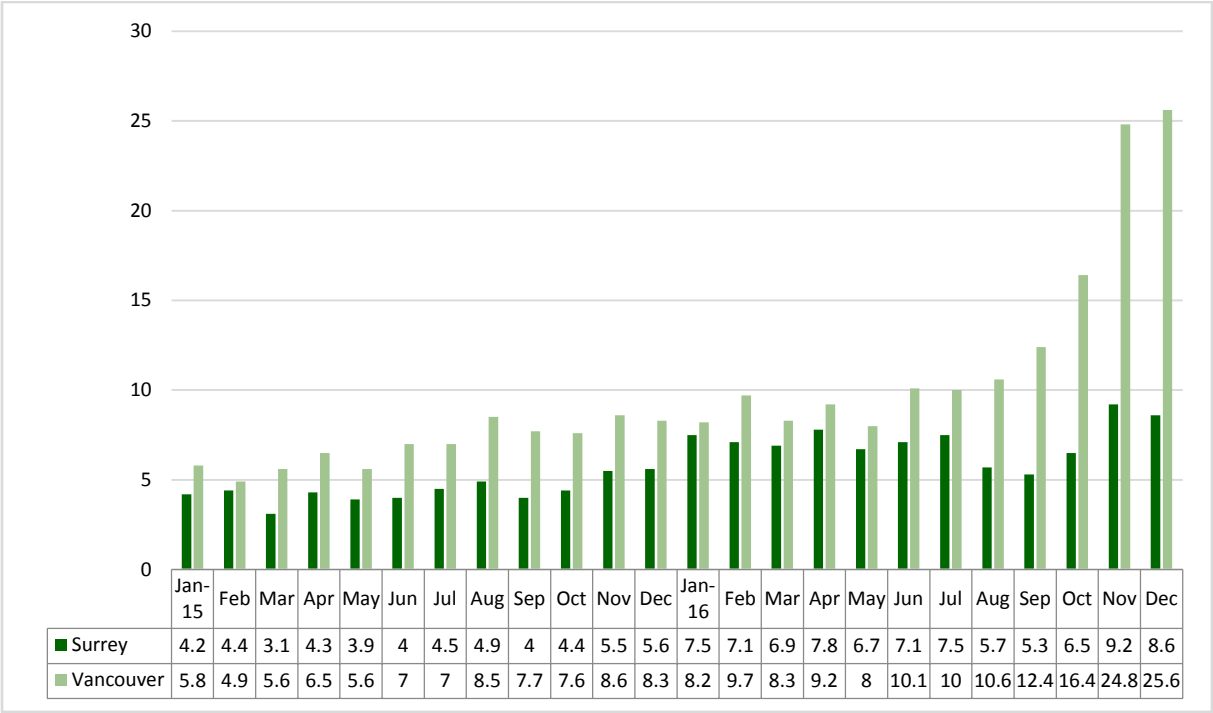


Chart 2: Average Number of Overdoses per day in Surrey and Vancouver: 2015 to 2016



	Jan-15	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan-16	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Surrey	4.2	4.4	3.1	4.3	3.9	4	4.5	4.9	4	4.4	5.5	5.6	7.5	7.1	6.9	7.8	6.7	7.1	7.5	5.7	5.3	6.5	9.2	8.6
Vancouver	5.8	4.9	5.6	6.5	5.6	7	7	8.5	7.7	7.6	8.6	8.3	8.2	9.7	8.3	9.2	8	10.1	10	10.6	12.4	16.4	24.8	25.6

Source: Surrey Fire Service Information Management System (FDM) & Vancouver Fire and Rescue Services Information Management System

FENTANYL

In British Columbia, "illicit fentanyl-detected deaths appear to account largely for the increase in illicit drug overdose deaths since 2012 as the number of illicit drug overdose deaths excluding fentanyl-detected has remained relatively stable since 2011 (average of 293 deaths per year)".[8] The importance of this observation is captured in the estimation that fentanyl is reported to be 100 times more powerful than morphine.[9]

Additionally, "anecdotal reports suggest that many overdoes appear to be in illicit circumstances, in individuals who thought they were using heroin, oxycodone, cocaine or another substance, but mistakenly took fentanyl".[10] There is evidence to suggest that increasing restrictions on certain regulated drugs (e.g. oxy) may have contributed to individuals seeking other drug options which, in some cases, "may have [had] the unintended effect of increasing overdoses" (p. 4).[11] This

[8] BC Coroners Service. (2017). Illicit Drug Overdose Deaths in B.C., January 1, 2007-December 31, 2016. http://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/death-investigation/statistical/illicit-drug.pdf

[9] Canadian Drug Policy Coalition. (2013). Opioid Overdose Prevention and Response in Canada. http://drugpolicy.ca/wp-content/uploads/2013/01/CDPC_OverdosePreventionPolicy_Final_July2014.pdf

[10] Canadian Centre on Substance Abuse. Deaths Involving Fentanyl in Canada, 2009-2014. http://www.ccsa.ca/Resource%20Library/CCSA-CCENDU-Fentanyl-Deaths-Canada-Bulletin-2015-en.pdf

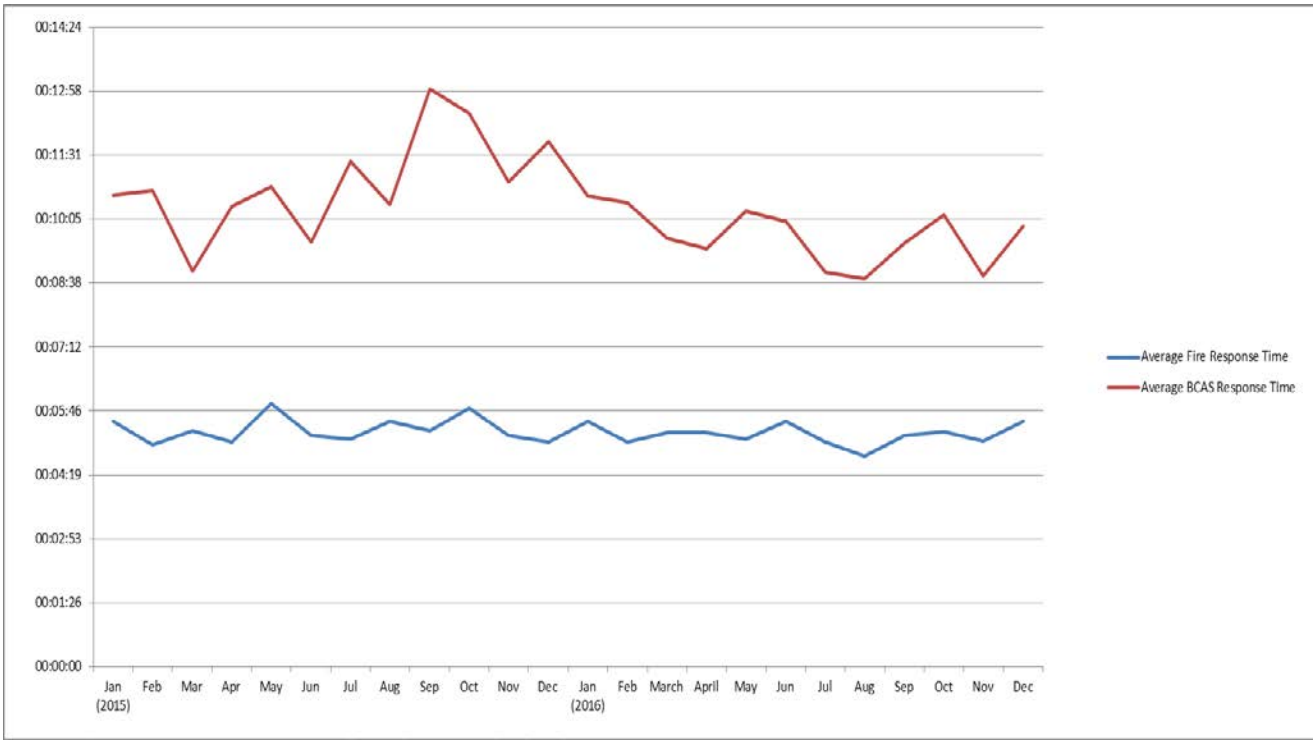
[11] Canadian Drug Policy Coalition. (2013). Opioid Overdose Prevention and Response in Canada. http://drugpolicy.ca/wp-content/uploads/2013/01/CDPC_OverdosePreventionPolicy_Final_July2014.pdf

observation highlights the need for multi-sectoral, coordinated responses across all levels of government.

EMERGENCY RESPONSE

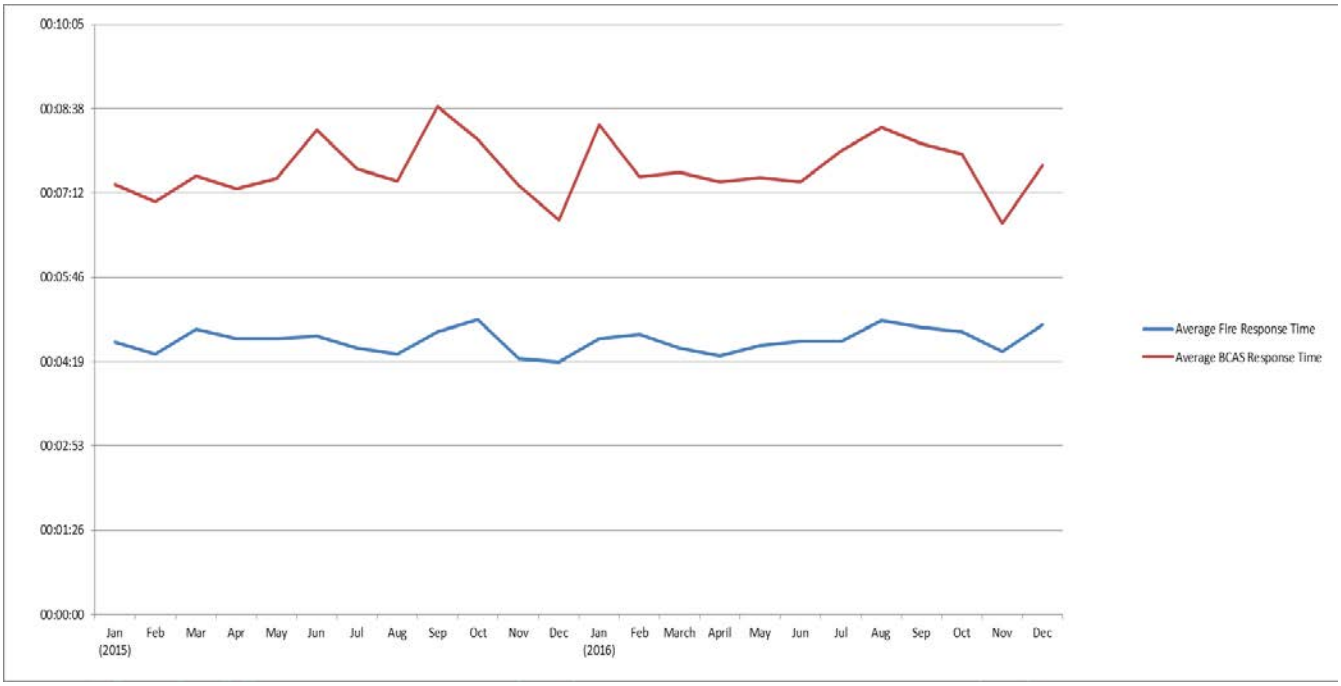
The majority of calls Surrey and Vancouver fire services respond to are emergency medical calls. The most significant argument for fire first responders playing a more integral role in responding to illicit drug overdoses is that fire services is likely to be on-scene first. As shown in Charts 3 and 4, fire first responder's ability to administer naloxone is a critical intervention that saves lives and lessens the likelihood of post-overdose complications.

Chart 3: Average Response Times Comparison between Surrey Fire Service and BCAS: 2015 to 2016[12]



[12] Fire Service Information Management System (FDM)

Chart 4: Average Response Times Comparison between Vancouver Fire and Rescue Services and BCAS: 2015 to 2016



Source: Vancouver Fire and Rescue Services Information Management System

FIRE FIRST RESPONDERS AND INTER-AGENCY PROVISION OF SERVICE

A quantitative survey of fire first responders was conducted which examined perspectives concerning naloxone administration training and the provision of emergency medical service in responding to illicit drug overdoses. Of the 97 participants who had attended where naloxone was administered, those who had attended in the last eight days were asked to reflect on on-scene cooperation with other first responders. Twenty-two of the 23 participants indicated that there was "good" (26.1%) and "very good" (69.6%) cooperation.

A critical aspect of call and scene management relates to the deployment and then release of fire department resources. Almost all of the respondents felt fire assets were released in a timely manner where naloxone had been administered. Feedback in hall discussions emphasized a professional and effective working relationship with paramedics. The increasing numbers of overdoses coupled with the reality that fire services' average response times are lower than those of BCAS underscore the importance of continually enhancing fire first responders' skillsets.

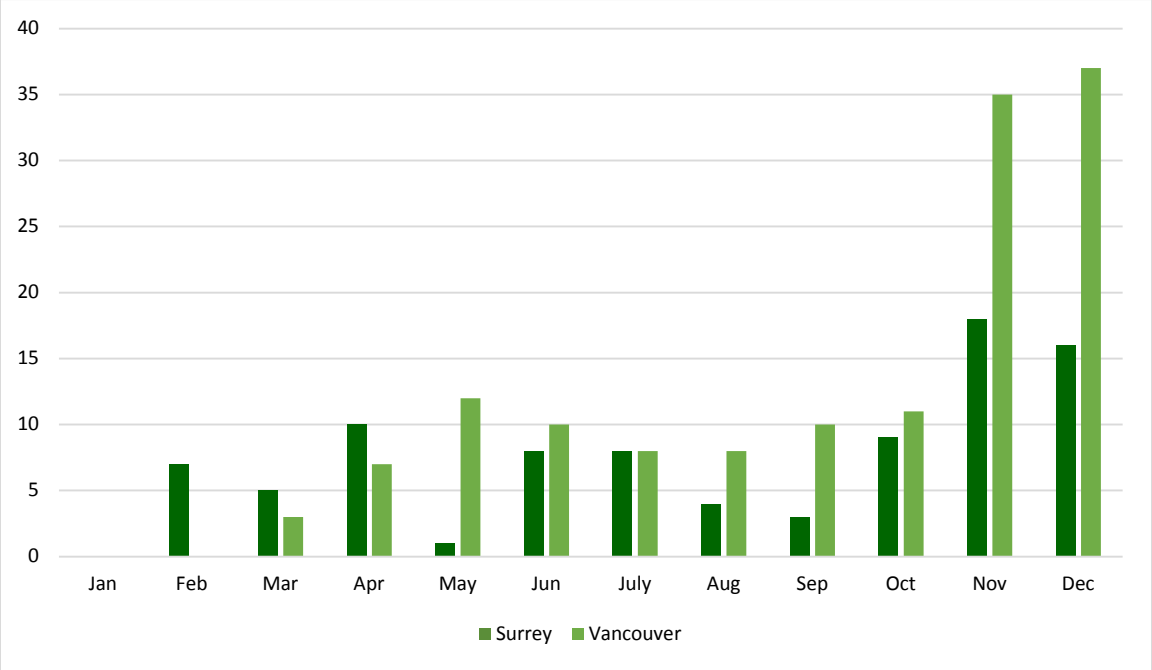
NALOXONE ADMINISTRATION

As previously stated, Surrey and Vancouver fire services implemented a naloxone administration protocol in February 2016. Prior to implementation first responders received initial training with a follow-up six month refresher course post implementation. In an effort to assess fire first responders' experiences with naloxone administration and the training associated with the protocol there were key stakeholder meetings, a review of naloxone administration information, a

survey of firefighters in Surrey and Vancouver, and focus group sessions[13] at four halls chosen in an effort to engage with first responders who had a higher likelihood of having administered naloxone based on type of calls and call volume.[14]

Providing fire first responders with access to naloxone administration skills acknowledges the first on-scene realities that characterize so many medical calls for service. In 2015, "the B.C. Ambulance Service administered naloxone, an opioid antagonist, in 3094 patient overdose events to reverse opioid-related respiratory depression" (p. 1).[15] It is well documented that "opioid overdose is reversible through the timely administration of naloxone, which has been used by emergency medical services for decades".[16] It is clear that an "appropriate response to an overdose requires sufficient knowledge to recognize when an overdose is occurring, to differentiate between opioid versus non-opioid overdose and non-overdose situations, and to respond appropriately".[17]

Chart 5: Naloxone Administration, Surrey and Vancouver: 2016



Despite increases in utilization through greater accessibility, "naloxone is an eminently safe and non-abusable substance that has one pharmacological function: to reverse the effects of opioids on

[13] Across the four halls a total of 24 firefighters were included in the hall discussions.
[14] The survey was conducted by providing a link to an on-line survey on FluidSurveys through work email to all firefighters in Surrey and Vancouver. They were invited to complete the survey on a voluntary basis. The response rate was 22% with 253 participants completing the survey from a population of 1131. Given the smaller sample and lower response, our margin of error is +/- 5.4%, 19 times out of 20.

[15] BC Emergency Health Services: http://www.bcehs.ca/about-site/Documents/Naloxone%20reference%20guide%20for%20first%20responders.pdf

[16] Davis, C.S., Ruiz, S., Glynn, P., Picariello, G., & Walley, A.Y. (p. 1530).

[17] Green, T.C., Heimer, R., & Grau, L. E.

the brain and respiratory system in order to prevent the ultimate adverse, death".[18] Given the obvious need for this skill enhancement, fire first responders received initial training and refresher training at the six month mark. Due to the nature of overdose calls, it was critical that the training was useful and provided firefighters with a level of confidence necessary in what can be logistically complex calls-for-service.

NALOXONE TRAINING AND FIRE FIRST RESPONDER EFFICIENCY

The following points must be emphasized in relation to naloxone training and fire first responder experiences:

- Training was new to fire first responders;
- Training was easily accepted and adopted by fire first responders;
- Training and skills were appropriate for fire first responders; and
- Other skill enhancement opportunities should be explored for fire first responders in pre-hospital care.

In looking at the respondents' perceptions regarding the impact of the initial training, 85.4% of the participants found the training "very useful" in relation to the overdose events. Sixty-seven percent of respondents indicated that they were "very confident" with respect to administering naloxone post-training. An additional 32.7% of participants indicated that they were "somewhat" or "moderately" confident. It would be useful to assess how that high ("very confident") level of confidence could be enhanced for an even greater proportion of fire first responders. Interestingly, 64.6% of respondents reported that their confidence level in administering naloxone stayed the same after the refresher training. Given the original confidence levels reported, the fact that 100% of the respondents indicated that their confidence increased or stayed the same can be viewed as a positive result. A common theme in the hall discussions was a general comfort with the protocol and an endorsement of the usefulness of the training with a concomitant agreement that "more training is never a bad thing".

EXPERIENCES ATTENDING A NALOXONE PROTOCOL CALL-OUT

At the time of the survey, three quarters of the respondents had attended an incident where the naloxone protocol had been used. On a scale of 1 to 10, 49.6% of those respondents reported very low stress levels (scored 1 to 3); however, 10% of respondents reported high stress (scored 8 to 10). Importantly, 34% of respondents indicated that these incidents generate levels of stress that they would classify as a 5 or above on a 10 point scale which is not insignificant. Not surprisingly given these numbers, hall discussions emphasized high levels of stress, not specifically in relation to administering naloxone but more generally in relation to other factors. In particular, hall

[18] Kim, D., Irwin, K. S., & Khoshnood, K. (p. 406).

participants raised the nature of these calls, the increasing number of calls, the complexities associated with drug use and overdose calls, on-scene wait times, and the frustration at not feeling like their efforts make a difference. One of the most critical issues discussed at all four halls was a sense of despair about the "band-aid" approach of the harm reduction strategy that is naloxone in the face of "overwhelming system failures to deal with the root causes of drug abuse." Hall participants voiced frustration at the plight of the patients they respond to on a daily basis asking questions such as "there's got to be a better plan, isn't there?" and "why can't we make them get treatment?" and "is it possible that we're actually making the problem worse by enabling such destructive behavior?"

There was also a discussion of mental health concerns beyond simply increasing levels of frustration. Participants in hall discussions spoke of colleagues' experiences of depression and anxiety at levels that necessitate more proactive and creative engagement in relation to access to clinical support and intervention and contractual flexibility. Participants described the inadequacy of Post-Traumatic Stress Disorder (PTSD) as a diagnosis given that their trauma "isn't post, we're in it, every day we're in it". This sense of overload was connected to inadequate resources by participants in two primary ways. First, insufficient resources and staffing based on meaningful utilization data that takes into account "recovery" time from difficult calls and sheer call volume. Second, inattention to mental health supports in the form of counselling, mechanisms to secure time off, hall rotation, and scheduling. In terms of job satisfaction, an impressive 90% of respondents reported being "satisfied" with 50.7% reporting feeling "very satisfied." Only four of the 219 respondents reported feeling unsatisfied. One of the most notable observations from the hall discussions was the sense of satisfaction and fulfillment that firefighters appear to feel for their jobs.

Looking Forward

The purpose of this study was to explore the current situation regarding illicit drug overdoses and the implementation of naloxone protocol in Surrey and Vancouver. In the last five years the number of illicit drug overdose deaths in BC has increased by 211% from 294 in 2011 to 914 in 2016. In the five years prior (2006-2011) the increase had been 28%. This study examined firefighters' experiences with the naloxone protocol training, the administration of naloxone in response to overdose events, and general perceptions about their role in responding to the overdose crisis. In summary:

- Fire first responders adapted well to learning and applying the new skill of administering life-saving drugs via intramuscular injection;
- Fire first responders are willing and interested in providing additional paramedical skills to assist with saving the lives of patients;
- The model of training was well-received and effective;

- There are ample opportunities to utilize fire first responders as medical responders during the opioid overdose crisis; and

- Fire first responders are an effective resource to administer life-saving protocols due to their ability to arrive before paramedics.

Based on this study and the feedback from participants, key considerations moving forward would include:

- An effective systemic response should be multi-sectoral and collaborative;

- The current training program is effective in preparing firefighters to utilize the naloxone protocol. There does seem to be some room to increase the confidence levels of those who have received the initial training perhaps by enhancing the practical application opportunities immediately following training;

- Firefighters embrace their medical roles and opportunities for increased health-related training and enhanced scope of practice initiatives. Fire first responders' attitudes toward medical/health care training and overdose calls specifically indicate an expressed need and interest in more health care training;

- Systemic responses, whether legislative, regulatory, and/or health-related need to be undertaken in a transparent and collaborative manner acknowledging the intended and unintended consequences of interventions in relation to the complexities inherent in the opioid overdose issue. Some "anecdotal reports suggest that many overdoses appear to be in illicit circumstances, in individuals who thought they were using heroin, oxycodone, cocaine or another substance, but mistakenly took fentanyl" (p. 8).[19] There is evidence to suggest that increasing restrictions on certain regulated drugs (e.g. oxy) may have contributed to individuals seeking other drug options which in some cases "may have [had] the unintended effect of increasing overdoses" (p. 4);[20] and,

- Firefighters report professional and cooperative working relationships with ambulance personnel in responding to overdose incidents.

There is no debate regarding the scope and impact of the problem; however, there is discussion on how to best respond in a manner that acknowledges the systemic, root causes of these issues and addresses them using an inter-agency, collaborative, and evidence-based approach that includes all tiers of government. It is hoped that the information in this study will contribute to this discussion

[19] Canadian Centre on Substance Abuse. Deaths Involving Fentanyl in Canada, 2009-2014. http://www.ccsa.ca/Resource%20Library/CCSA-CCENDU-Fentanyl-Deaths-Canada-Bulletin-2015-en.pdf

[20] Canadian Drug Policy Coalition. (2013). Opioid Overdose Prevention and Response in Canada. http://drugpolicy.ca/wp-content/uploads/2013/01/CDPC_OverdosePreventionPolicy_Final_July2014.pdf

and will ultimately benefit opioid overdose patients and the community overall as more effective approaches are developed.

References

BC Coroners Service. (2017). Illicit Drug Overdose Deaths in B.C., January 1, 2007-December 31, 2016. http://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/death-investigation/statistical/illicit-drug.pdf

BC Emergency Health Services. Administration of INTRAMUSCULAR Naloxone for Suspected or Confirmed Opioid Overdose. http://www.bcehs.ca/about-site/Documents/Naloxone%20reference%20guide%20for%20first%20responders.pdf

Canadian Centre on Substance Abuse. Deaths Involving Fentanyl in Canada, 2009-2014. http://www.ccsa.ca/Resource%20Library/CCSA-CCENDU-Fentanyl-Deaths-Canada-Bulletin-2015-en.pdf

Canadian Drug Policy Coalition. (2013). Opioid Overdose Prevention and Response in Canada. http://drugpolicy.ca/wp-content/uploads/2013/01/CDPC_OverdosePreventionPolicy_Final_July2014.pdf

Carter, C. I., & Graham, B. (2013). Opioid Prevention & Response in Canada. *Canadian Drug Policy Coalition,* 1-16.

Davis, C. S., Ruiz, S., Glynn, P., Picariello, G., & Walley, A. Y. (2014). Expanded Access to Naloxone Among Firefighters, Police Officers, and Emergency Medical Technicians in Massachusetts. *American Journal of Public Health*, *104*(8), e7-e9. doi:10.2105/AJPH.2014.302062

Davis, C. S., Carr, D., Southwell, J. K., & Beletsky, L. (2015). Engaging Law Enforcement in Overdose Reversal Initiatives: Authorization and Liability for Naloxone Administration. *American Journal of Public Health*, *105*(8), 1530-1537. doi:10.2105/AJPH.2015.302638

Green, T. C., Heimer, R., & Grau, L. E. (2008). Distinguishing signs of opioid overdose and indication for naloxone: an evaluation of six overdose training and naloxone distribution programs in the United States. *Addiction*, *103*(6), 979-989. doi:10.1111/j.1360-0443.2008.02182.x

Kim, D., Irwin, K. S., & Khoshnood, K. (2009). Expanded Access to Naloxone: Options for Critical Response to the Epidemic of Opioid Overdose Mortality. *American Journal of Public Health*, *99*(3), 402-407. doi:10.2105/AJPH.2008.136937

Author's Biographical Information

Dr. Martha Dow is a researcher and consultant working in the areas of public safety, education, and organizational change and is an Associate Professor in the Department of Social, Cultural and Media Studies at the University of the Fraser Valley. Contact her at martha.dow@ufv.ca

Dr. Katherine Watson is a researcher working in the areas of education and health and is an Associate Professor in the Department of Social, Cultural and Media Studies at the University of the Fraser Valley. Contact her at katherine.watson@ufv.ca

Dr. William Dick is Vice President of Medical Programs for British Columbia Emergency Health Services and Clinical Associate Professor of Emergency Medicine at the University of British Columbia School of Medicine. He possesses a Doctor of Medicine from the University of British Columbia, and a Master of Science Degree from the University of Western Ontario. He holds a FRCPC/FACEP in Emergency Medicine and a Diploma in Epidemiology from UBC. He has a Diploma in Leadership from Simon Fraser University.

John McKearney is the Fire Chief for the City of Vancouver, British Columbia. He has 37 years of experience in the Fire Service. He possesses a Master's Degree in Leadership from Royal Roads College, has a Chief Fire Officer (CFO) designation, and completed a Senior Fellowship Fire Executive Program at Harvard University. He is currently a Board Member with both the Canadian Association of Fire Chiefs (CAFC) and the Fire Chiefs' Association of British Columbia (FCABC). Contact him at john.mckearney@vancouver.ca

Len Garis is the Fire Chief for the City of Surrey, British Columbia, an Adjunct Professor in the School of Criminology and Criminal Justice & Associate to the Centre for Social Research at the University of the Fraser Valley (UFV), a member of the Affiliated Research Faculty at John Jay College of Criminal Justice in New York, and a faculty member of the Institute of Canadian Urban Research Studies at Simon Fraser University. Contact him at LWGaris@surrey.ca

Larry Thomas is a Deputy Fire Chief for the City of Surrey, BC, and is a Chartered Manager, C. Mgr with 28 years' experience. He is currently responsible for Operations, Human Resources and Labour Relations. He has a background in Science from Simon Fraser University and Economics from Douglas College. Contact him at LSThomas@surrey.ca

Alex Tyakoff is the Strategic Planning Analyst for the City of Surrey Fire Service, BC. He has 26 years' of experience in public safety research and analysis, and a former city planner. He possesses a Master of Science degree in Urban and Regional Planning from the University of British Columbia. He is a sessional lecturer in graduate studies, School of Criminology and Criminal Justice at UFV. Contact him at ATyakoff@surrey.ca

Appendix

Surrey and Vancouver Fire Services Survey on the provision of Naloxone injections by firefighters

1. Have you received the "Train the Trainer Model" of Naloxone injections to opioid overdose patients? Yes/No (If no, then end of survey Thank you).

The following questions are about the Train the Trainer Model:

2. How would you rate the training model you received for the provision of Naloxone injections to opioid overdose patients? Poor; fair; good; very good
3. How useful is this training for your job? Not useful at all; somewhat useful; moderately useful; very useful
4. How comfortable were you with this training model? Not comfortable at all; somewhat comfortable; moderately comfortable; very comfortable.
5. After this training, how confident did you feel in administering the Naloxone protocol for opioid overdoses? Not confident at all ; somewhat confident; moderately confident; very confident
6. Have you received the Six Month Refresher Self-directed Training? Yes/No
   If no, direct to next question.

   If yes carry on with the following:

The following questions are about the Six Month Refresher Self-directed Training:

7. How would you rate the self-directed refresher training model you received for the provision of Naloxone injections to opioid overdose patients? Poor; fair; good; very good
   How useful is this training for your job? Not useful at all; somewhat useful; moderately useful; very useful
8. How comfortable were you with this self-directed refresher training model? Not comfortable at all; somewhat comfortable; moderately comfortable; very comfortable.
9. Do you feel that the self-directed refresher training was necessary? Yes/No/DK
10. Would you say that your level of confidence in administering the Naloxone protocol for opioid overdoses after this self-directed refresher training _____ went up; went down; stayed the same.

Comparing training models:

11. Which training model did you prefer? Train the trainer; self-directed refresher; DK; no preference
12. If you have a preference for one training model over the other, please explain why?
13. In your view, is more training for firefighters in opioid overdose protocols necessary? Yes/No/DK

Naloxone Delivery:

14. Since receiving your training for the Naloxone protocol, how often would you estimate that you have administered the protocol? _____

15. On a scale from 1-10 with 1 being very low and 10 being very high, how would you generally rate your level of stress from calls where the Naloxone protocol for overdoses is used? ____ or NA
16. In the past 8 days (during your last shift/current shift) have you administered the Naloxone protocol? Yes/No
    If yes,
17. In the last 8 days, what was your primary role in the protocol? (Only one)
    - I always administer the injection
    - I always record
    - I mostly administer but will record
    - I mostly record but will administer
    - Other please specify
18. In the past 8 days, how would you rate the cooperation of all first responders on site when the Naloxone injection is used? Poor; fair; good; very good
19. In the past 8 days do you think Fire has been released in a timely manner from the site where Naloxone has been administered? Yes/No/DK

How much would you agree/disagree with the following statements?

20. Firefighters need more health care training
21. Firefighters should **not** be administering Naloxone to opioid overdose patients because we cannot "do it all". (reverse)
22. I would like to have more training in health care related skills
23. I prefer not to have to deal with opioid overdose patients on the job (reverse)
24. I am concerned that my job is changing too rapidly (reverse)

Your job:

25. In the past year, would you say your job workload has: increased a great deal, increased a bit; stayed the same; decreased a bit; decreased a great deal
26. All things considered, how satisfied are you with your current job? Very dissatisfied; dissatisfied; neutral, satisfied, very satisfied.

About you:

27. What is your gender? Male; Female; Other
28. What is your education level?
29. What is your age (in years)?
30. In what year did you join the fire services?

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