

# Executive Summary: Observing from Afar: Continuous Pulse Oximetry for People Who Smoke Opioids to Prevent Overdose Deaths

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## Background

In 2021, 2,232 people died of an overdose in British Columbia (BC), the highest annual death toll on record.<sup>1</sup> Smoking opioids has become the most common mode of consumption and the proportion of overdose deaths from smoking unregulated drugs increased from 31% to 56% between 2016 and 2020.<sup>2</sup>

Given the rise in smoking-related deaths during the coronavirus disease (COVID-19) pandemic since 2019, our project responded to an urgent need to develop a remote monitoring system that maintains physical distancing and is effective, feasible, and acceptable to staff at overdose prevention services (OPS) when monitoring and responding to people who smoke drugs. Continuous pulse oximetry enables real-time, remote oxygen level monitoring for patients in health care settings. Introducing this technology at OPS for individuals smoking drugs would promote service user and staff safety by allowing monitoring from a safe distance.

## Methods

We implemented a novel continuous pulse oximetry monitoring protocol (allowing remote monitoring) at OPS for people who smoke opioids during COVID-19 and evaluated its effectiveness, feasibility, and acceptability. We used a participatory community-based research design: we collaborated with people with lived/living experience of substance use throughout planning, implementation, data analysis, and knowledge translation.

From March to August 2021, four OPS that offer observed inhalation facilities in BC implemented the study and enrolled persons presenting to consume opioids by smoking. These four OPS were the Overdose Prevention Society in Vancouver, and three sites in Victoria: Rock Bay Landing, Travelodge (run by AIDS Vancouver Island Health & Community Services), and SOLID Outreach Society.

We hired and trained peer researchers (people with lived and living experience of substance use) to implement study processes at the OPS. Peer researchers enrolled participants, obtained consent, and collected data. Peer researchers administered surveys to participants at each visit and to OPS staff every two weeks, assessing their experiences with continuous pulse oximetry, and satisfaction using simple rating scales. Peer researchers also completed a self-survey after each participant's visit reporting their satisfaction and experience with the continuous pulse oximetry monitoring process (e.g., pros and cons).

We employed a low-barrier approach to project implementation. Individuals could participate in this study more than once, but not on the same day. We analyzed event-level data to capture unique experiences and learnings associated with each monitoring event. To characterize our study population, we also attempted to identify and

<sup>1</sup> British Columbia Coroners Service. Illicit Drug Toxicity Deaths in BC January 1, 2011 – December 31, 2021.

<https://www2.gov.bc.ca/assets/gov/birth-adoption-death-marriage-and-divorce/deaths/coroners-service/statistical/illicit-drug.pdf>

<sup>2</sup> British Columbia Coroners Service. Illicit Drug Toxicity Deaths in BC Knowledge Update: Mode of Consumption.

<https://www2.gov.bc.ca/assets/gov/birth-adoption-death-marriage-and-divorce/deaths/coroners-service/statistical/mode-of-consumption.pdf>

remove potential duplicate participants by evaluating records that matched completely on all variables of age, gender, race, comorbidities, OPS, and participant anonymous identifier.

### Findings

The study included a total of 599 observed opioid smoking events: 93 events from the Overdose Prevention Society, 91 from Rock Bay Landing, 185 from Travelodge, and 230 from SOLID Outreach Society. The study obtained 599 data collection forms and post-monitoring surveys from participants, 511 post-monitoring surveys from peer researchers, and 19 post-monitoring surveys from OPS staff.

After the removal of duplicates, the mean age of 535 individual respondents was 38.2 years (standard deviation [SD]: 10.2; range: 18 to 66 years old ), and 72.9% were male. The mean ages of men and women were 38.8 years (SD: 10.1) and 35.8 years (SD: 10.3), respectively.

### *Benefits of Continuous Pulse Oximetry*

No overdose events occurred while clients were being monitored by our continuous oximetry protocol. OPS staff reported that the monitoring protocol was feasible (e.g., equipment was easy to work with), acceptable (e.g., improved OPS staff confidence in monitoring and responding to overdose), and promoted safety (e.g., allowed monitoring at a safe distance). People who smoke opioids at OPS reported that continuous pulse oximetry provided a sense of safety and reassurance when using drugs. Participants and OPS staff reported high satisfaction and reported that they would use the continuous pulse oximetry again.

### *Challenges Associated with Continuous Pulse Oximetry*

Many peer researchers, OPS staff, and participants experienced challenges with the continuous pulse oximetry monitoring, mostly technical issues (e.g., inconsistent connection) or usability challenges (e.g., restrictions in hand movement while applied and difficulties placing on hand). The peer researchers noted that through iterative learning, over time, it became easier to use the continuous pulse oximetry and troubleshoot challenges and issues. Peer researchers offered suggestions for troubleshooting technical issues (e.g., wash hands, place the sensor so it lays flat and is tightly applied to the fingernail without nail polish, fake nails, or dirt) and usability challenges (e.g., have the individual prepare their drugs before applying the continuous pulse oximetry sensor).

### Conclusion

Our study successfully implemented a continuous pulse oximetry protocol at partnering OPS, and OPS staff and clients reported that it was an effective, feasible and acceptable service. Our findings support that improving access to continuous pulse oximetry protocols at OPS (e.g., provincial scale-up) and integrating oximetry into harm reduction services (e.g., overdose response training) could facilitate safer smoking. Additionally, our study results and the feedback we collated from OPS staff and service users support the following recommendations:

- Expand continuous oxygen monitoring protocols to additional OPS, service users (e.g., people who inject opioids), and other settings (e.g., private housing, apps for people who use opioids alone).
- Expand pulse oximetry training (facilitated by people with lived experience) to all staff at OPS to assist them in effectively identifying and responding to overdoses.
- Expand the use of pulse oximeters to all OPS staff, service users, and bystanders.
- Expand observed inhalation spaces at existing OPS and develop and create additional indoor inhalation sites.

- Collaborate with people with lived experience of smoking opioids to improve harm reduction services for people who smoke opioids that are specifically targeted towards their needs (e.g., access to new inhalation supplies and observed inhalation spaces).