Participants' Use Patterns of a Biometric Dispensing Machine-Based Safer Opioid Supply Program in Vancouver, Canada

Mohammad Karamouzian[1,2], Geoff Bardwell[3], Jeanette Bowles[4], Dan Werb[1,2]

[1]Centre on Drug Policy Evaluation, [2]University of Toronto, [3]University of Waterloo, [4]British Columbia Centre on Substance Use

2025 Harm Reduction International
April 29, 2025

Land Acknowledgment

The Centre on Drug Policy Evaluation is located on the traditional territory of many nations including the Mississaugas of the Credit, the Anishnabeg, the Chippewa, the Haudenosaunee, and the Wendat peoples, and is now home to many diverse First Nations, Inuit, and Métis peoples.

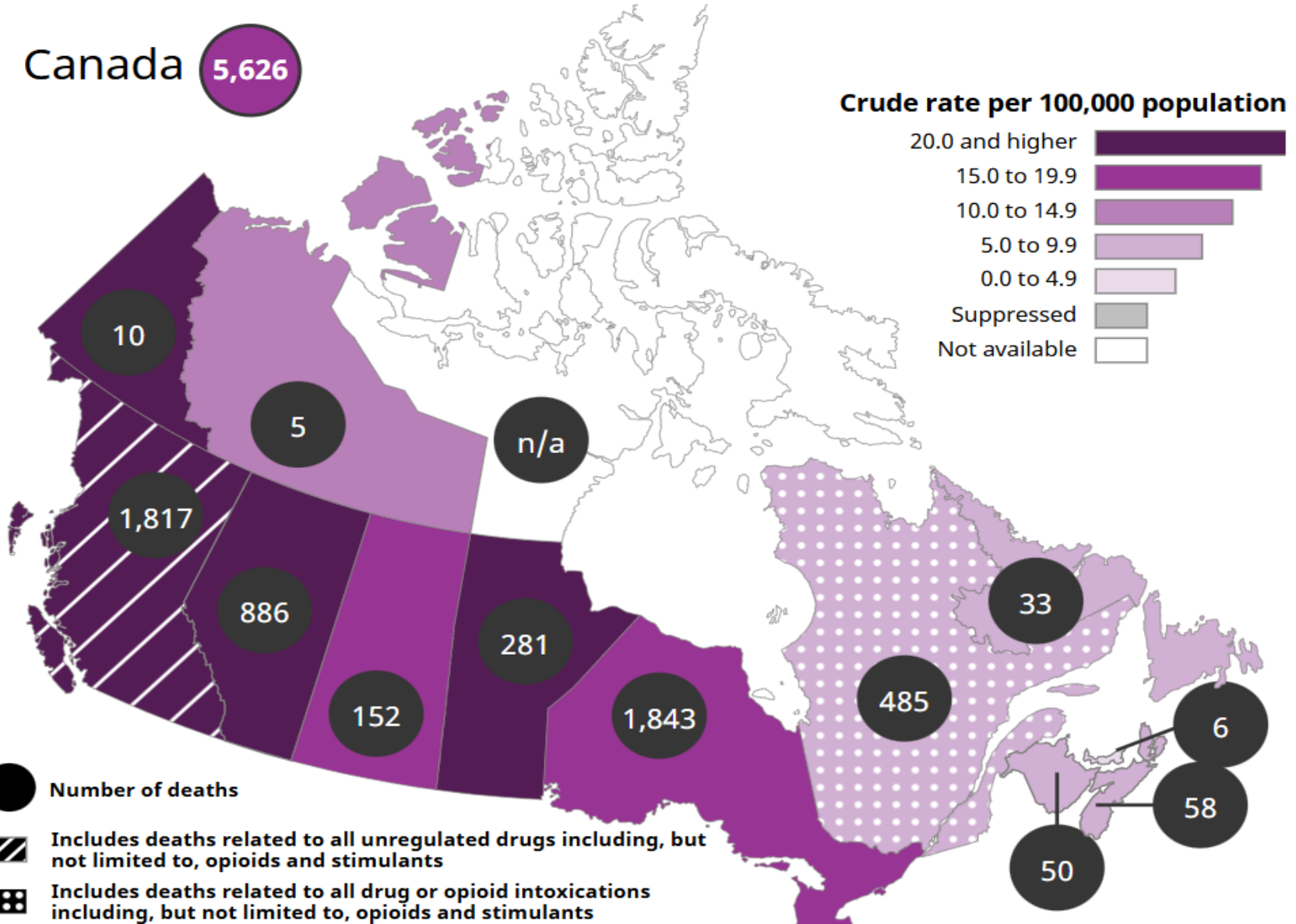
We acknowledge that we are gathering on the ancestral land of the Muisca people, the original inhabitants of this region. We recognize their enduring connection to this territory and pay respect to their history and culture.

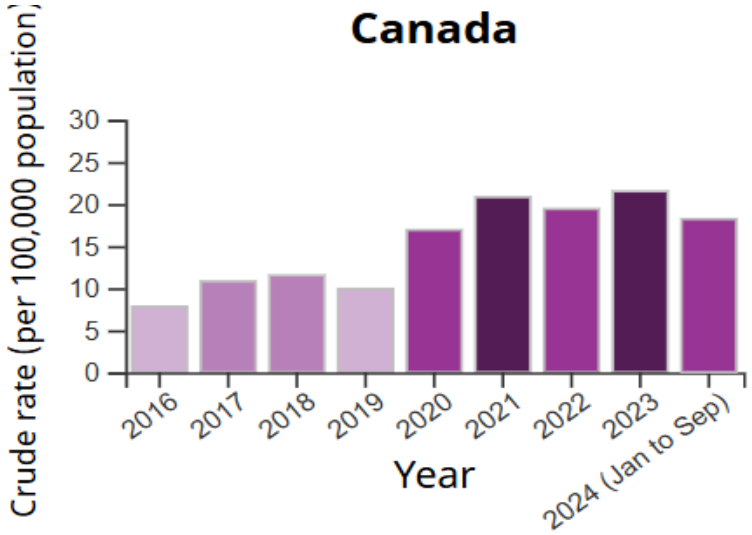
CENTRE ON
DRUG POLICY
EVALUATION

Disclosure

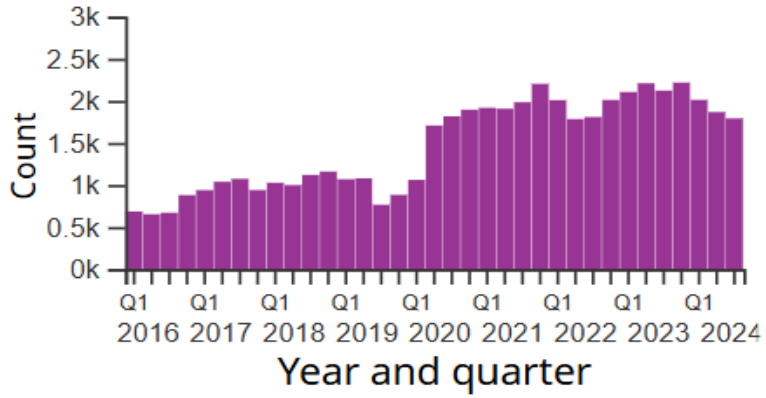
None that I know of ☺

Background & Rationale

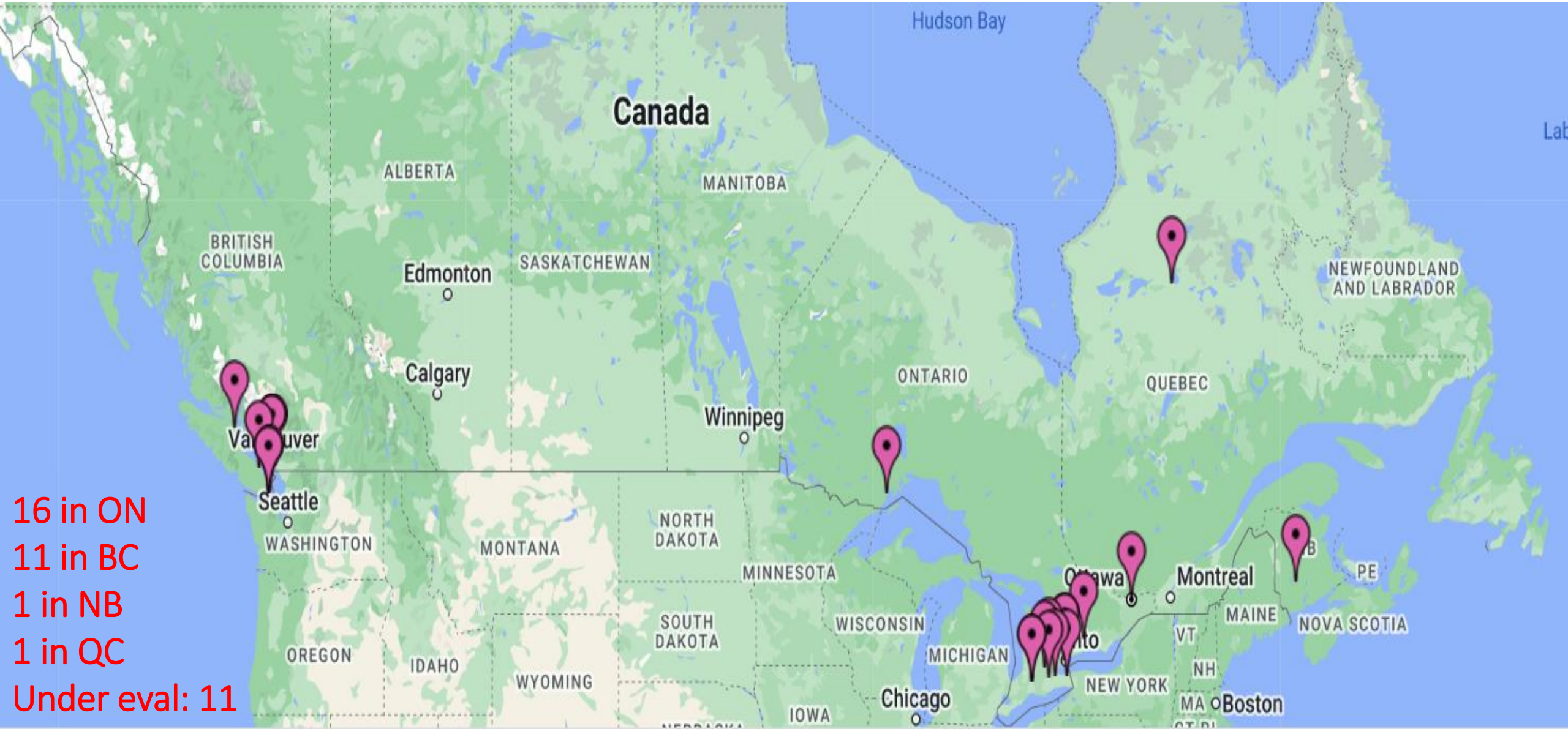




~21 deaths/day



Health Canada-funded Safer Supply Programs



16 in ON
11 in BC
1 in NB
1 in QC
Under eval: 11

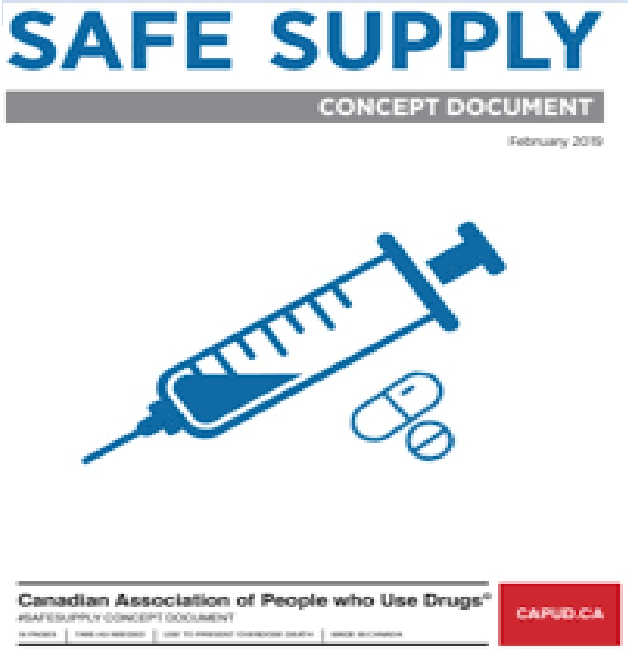
Different Models of Care

iOAT = Observed, injectable opioids

- Observed doses in clinical settings
- >1 clinic visits a day

Safer opioid supply (SOS) = Unobserved, take-home tablet opioids

- Daily dispensed at pharmacy
- Unobserved dosing



Risk Mitigation prescribing (BC only)

- Take-home prescriptions for unobserved dosing
- Opioids, stimulants, benzos


RESEARCH

OPEN ACCESS

Check for updates

Effect of Risk Mitigation Guidance for opioid and stimulant dispensations on mortality and acute care visits during dual public health emergencies: retrospective cohort study

Amanda Slaunwhite,[1,2,3] Jeong Eun Min,[3] Heather Palis,[2,4] Karen Urbanoski,[5,6] Bernie Pauly,[5,7] Brittany Barker,[5,6,8,9] Alexis Crabtree,[1,2] Paxton Bach,[10,11] Emmanuel Krebs,[3,12] Laura Dale,[3] Louise Meilleur,[8] Bohdan Nosyk[3,9]

For numbered affiliations see end of the article

Correspondence to: B Nosyk bnosyk@sfu.ca (ORCID 0000-0003-2513-3718)

Additional material is published online only. To view please visit the journal online.

Cite this as: BMJ 2024;384:e076336 http://dx.doi.org/10.1136/bmj-2023-076336

Accepted: 16 November 2023

Abstract

Objective

To determine the effect of opioid and stimulant Risk Mitigation Guidance (RMG) dispensations on mortality and acute care visits during the dual public health emergencies of overdose and covid-19.

DESIGN

Population based retrospective cohort study.

SETTING

British Columbia, Canada.

PARTICIPANTS

5882 people with opioid or stimulant use disorder who received RMG prescriptions for opioids (n=5356) and/or stimulants (n=1061) (535 received both) from 27 March 2020 to 31 August 2021.

MAIN OUTCOME MEASURES

All cause and overdose specific mortality and acute care visits in the week after RMG opioid or stimulant dispensation. RMG recipients were matched 1:1 with controls through use of high dimensional propensity score matching. Marginal structural models, executed on weekly time steps, were used to measure the effect of dispensations on outcomes.

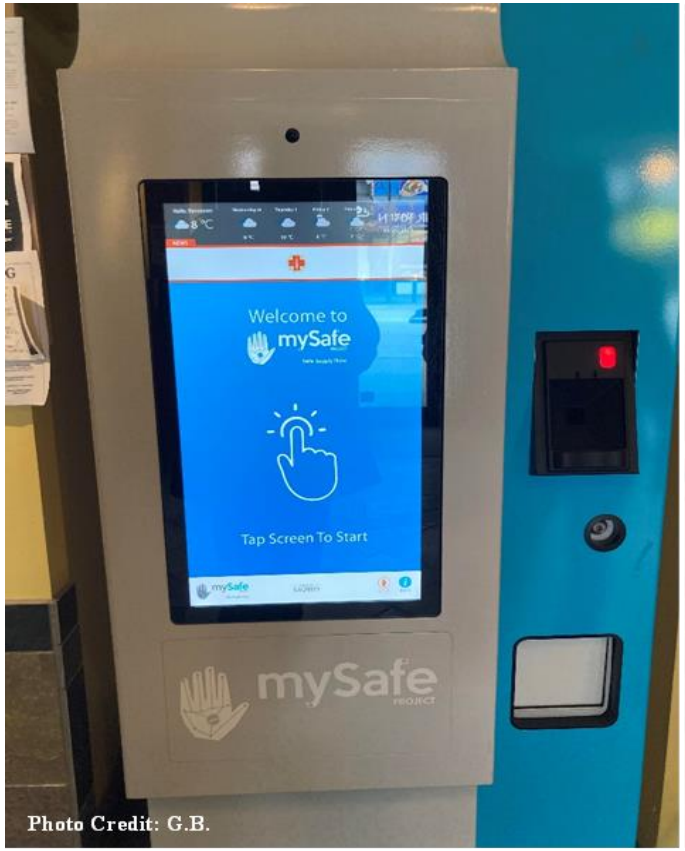
associated with reduced all cause mortality (adjusted hazard ratio 0.50, 0.20 to 1.23) or overdose related mortality (0.53, 0.18 to 1.56). The protective effect of RMG opioid dispensations increased with the number of days the medications were dispensed in a given week. People who received four or more days of RMG opioid dispensations had reduced all cause mortality (adjusted hazard ratio 0.09, 0.04 to 0.21) and overdose related mortality (0.11, 0.04 to 0.32) compared with the control group. Opioid RMG dispensations did not significantly modify the odds of all cause or overdose related acute care visits. Dispensations of RMG stimulants were associated with a significant decrease in the odds of acute care visits for any cause but did not affect the odds of overdose related acute care visits.

CONCLUSIONS

RMG opioid dispensations were associated with reduced overdose related and all cause mortality among a sample of people with opioid use disorder. Pharmaceutical alternatives to the illegal drug supply are promising interventions to reduce mortality in people with opioid use disorder.

The MySafe Program

- Innovative SSPP model in Vancouver, Canada
- Biometric dispensing machines providing prescribed hydromorphone tablets (8 mg)
- Accessible 24/7 via biometric authentication (handprint scanner)
- Locations: Overdose prevention site and supportive housing settings
- Aim: Reduce reliance on unregulated opioids, improve accessibility, reduce healthcare stigma



CENTRE ON
DRUG POLICY
EVALUATION

Study Objectives

- Characterize participant demographics and substance use patterns
- Machine usage patterns (timing, frequency)
- Participant satisfaction and self-reported outcomes
- Urine drug screening (UDS) results (drug use patterns pre- and post-enrollment)

CENTRE ON
DRUG POLICY
EVALUATION

Methods

- Study period: January 2020 – September 2022
- Data sources:
  - Administrative data from dispensing machines (usage patterns)
  - Baseline and follow-up surveys (socio-demographics, substance use, satisfaction)
  - Qualitative urine drug screening (UDS) tests (baseline and follow-up)
- Participants: 96 enrolled, 66 completed follow-up (median follow-up: 7.8 months)
- Eligibility criteria: Daily fentanyl use, interest in hydromorphone, high overdose risk

Participant Characteristics (Baseline)

- Median age: 40 years
- Predominantly male (70%), unemployed (84%), receiving housing support (91%)
- 31% Indigenous
- 83% previous unsuccessful OAT experience
- High prevalence of fentanyl (75%) and methamphetamine (67%) use, as well as overdose history (72%) at baseline

Machine Usage Patterns

- Total visits recorded: 13,323
- Majority of visits (76%) occurred outside typical pharmacy hours (5 p.m. – 11 p.m.)
- Weekend visits: 29%
- High demand for flexible, after-hours access to safer supply medications

Participant Satisfaction & Self-Reported Outcomes

- 100% satisfaction among follow-up participants (n=66)

- Key reasons for satisfaction:
  - Accessibility and convenience
  - Reduced anxiety about withdrawal and cravings
  - Machine does not judge

- Self-reported outcomes:
  - Reduced use of unregulated opioids (83%)
  - Reduced use of other unregulated drugs (65%)
  - Decreased engagement with street economy (59%)

Qualitative UDS Results

- Continued presence of fentanyl (baseline: 79%, follow-up: 82%) and methamphetamine (baseline: 71%, follow-up: 80%)

- Increase in benzodiazepine presence (baseline: 26%, follow-up: 49%), likely reflecting drug market changes (benzodiazepine adulteration in fentanyl supply)

Areas for Improvement

- Medication dosage concerns:
  - 64% participants reported prescribed hydromorphone dose insufficient
  - Dependence on clinician buy-in
  - Suggests need for flexible, individualized dosing strategies

- Technological challenges:
  - Occasional automated dispensing issues reported by 32% of participants
  - Highlights need for ongoing technical support and machine maintenance

Limitations

- Limitations:
  - Qualitative UDS tests (presence vs. quantity)
  - Single urban setting (generalizability)
  - Potential biases (social desirability, recall)

- See also:
  - Ivsins, A, et al. JSAD 85.6 (2024): 845-855.
  - Mansoor, M, et al. Harm Reduction Journal 20.1 (2023): 61.
  - Bardwell, G, et al. CMAJ 195.19 (2023): E668-E676.
  - Bardwell, G, et al. Social Science & Medicine 345 (2024): 116683.

Take-home Message

- Biometric dispensing machines represent a promising innovation in safer opioid supply
- Effective in meeting participant needs outside traditional service hours
- Potential to reduce harms associated with unregulated drug use
- Continued optimization needed (dosage, technology, medication options)

Thanks so much for listening.

Questions?

mohammad.karamouzian@unityhealth.to

CIHR IRSC
Canadian Institutes of Health Research
Instituts de recherche en santé du Canada

UNITY HEALTH TORONTO