

Drug-related Overdose Deaths in British Columbia and Ontario, 1992-2004

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ABSTRACT

Objective: To compare rates of fatal drug-related overdose death (OD) cases – a major harm outcome of illicit substance use – in the two provinces of British Columbia (BC) and Ontario, and the two largest municipalities in those provincial jurisdictions, namely the cities of Vancouver and Toronto, between 1992 and 2004.

Methods: Provincial coroners' data of drug-related OD cases for the provincial jurisdictions of BC and Ontario, and the municipal jurisdictions of Vancouver and Toronto, are descriptively presented and compared.

Results: After drastic increases in the initial part of the observation period, OD rates in BC have been declining; moreover, due to major reductions of OD cases in Vancouver, the ratio of OD cases between Vancouver and the province of BC has fallen considerably. Conversely, OD rates in Ontario have remained stable at low levels, whereas Toronto has seen a slight decline in such rates during the observation period.

Interpretation: The recent establishment and expansion of treatment and harm reduction interventions may have influenced the decline of ODs in BC, yet similar interventions in Ontario did not have a similar effect, perhaps due to different patterns of illicit drug use. OD rates in jurisdictions across Canada need to be monitored and analyzed to inform evidence-based policy development.

MeSH terms: Street drugs; overdose; mortality; public policy; Canada

La traduction du résumé se trouve à la fin de l'article.

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Source of funding: The authors acknowledge research funding support from the Canadian Institutes of Health Research (CIHR) and the Canadian Centre on Substance Abuse (CCSA).

Mortality due to overdose death (OD) is a major harm associated with illicit substance use. Data from Western jurisdictions document that illicit drug user populations feature mortality rates six- to twentyfold that of average populations; each year, 1-2% of active illicit drug users die.¹⁻⁴ Several Western jurisdictions experienced pronounced periods of increases in OD mortality in the previous decades.⁴⁻⁷ Socio-epidemiological analyses have demonstrated that drug-related mortality is mostly concentrated in urban centres, where disproportionate numbers of drug users are located.^{5,8} Research suggests that fluctuations in OD mortality are probably associated with two major categories of determinants, namely a) systematic or environmental, and b) behavioural or user-specific determinants.⁹ For the former, the role of socio-urban characteristics, drug markets and OD response systems have been identified; for the latter, the importance of drug combinations, administration routes or tolerance (influenced by previous exposure to corrections or treatment) as well as factors of marginalization (housing) have been recognized.^{3,6,9-13} Specifically, the importance of certain drug combinations (e.g., opioid-benzodiazepine or -cocaine or -alcohol combinations) in OD incidents has frequently been confirmed.^{6,11,12}

Targeted measures can reduce the occurrence of OD fatalities among drug user populations. Effective treatment interventions (e.g., opioid substitution programs) clearly reduce OD risk among drug users, while risk reduction measures (e.g., naloxone provision or Safer Injection Facilities) have been suggested to prevent the incidence or reduce the fatal consequences of overdose.^{6,14} Jurisdictions in which such interventions have been systematically expanded have witnessed demonstrable decreases in ODs in recent years.^{5,7}

In Canada, there are an estimated 500-1,000 drug-related ODs annually;^{5,15} more precise figures are hindered by fragmented reporting systems. The province of British Columbia (BC) – and predominantly its main urban centre of Vancouver – made headlines in the mid-1990s with dramatic increases in ODs, peaking at more than one death per day.^{16,17} On the contrary, OD rates in Ontario have traditionally been low. The specified jurisdictions house some of the largest street drug use popula-

tions in the country. At the same time, illicit drug users in Vancouver and Toronto differ considerably in some major characteristics: while Vancouver houses a highly concentrated and visible street drug use population engaging predominantly in (combined) heroin and cocaine injection, Toronto's drug scene is rather dispersed and largely characterized by (in many cases non-injectable) use of a wide range of illicit prescription opioids as well as a high prevalence of oral crack use.¹⁷⁻¹⁹ Given the availability of provincial coroners' data for the specified jurisdictions, a comparison of OD rates over the past decade is meaningful and instructive: these rates serve as key indicators for drug-related harm epidemiology, provide benchmarks for policy impact, and are of interest in the context of both Vancouver's and Toronto's recent efforts to implement or develop new municipal drug strategy plans.^{20,21}

The objective of this research was to compare the occurrence of drug-related OD incidents in these defined jurisdictions for the period 1992-2004, and consider implications for interventions and research.

METHODS

Official provincial coroners' data were used for the comparison of drug-related OD mortality rates from both the provinces of BC and Ontario and the respective two major municipalities, Vancouver and Toronto. The OD mortality data utilized included suicides involving illicit drugs.

Coroners' mortality data have been shown to be more complete and more reliable than the available Statistics Canada mortality statistics reporting drug OD incidents.²² Following the standards of both Canadian studies on the Social Costs of Substance Abuse encompassing both jurisdictions, we included all OD cases where at least one illegal drug was mentioned.^{22,23} More specific analyses by categories of drugs were not possible, as most drug-related OD incidents involve more than one drug, and specific causality attribution is impossible. In order to allow comparability, the numbers of OD cases were standardized to the respective jurisdictional populations; these denominators were obtained from Statistics Canada (Demography Division). It should be noted that the population estimates for

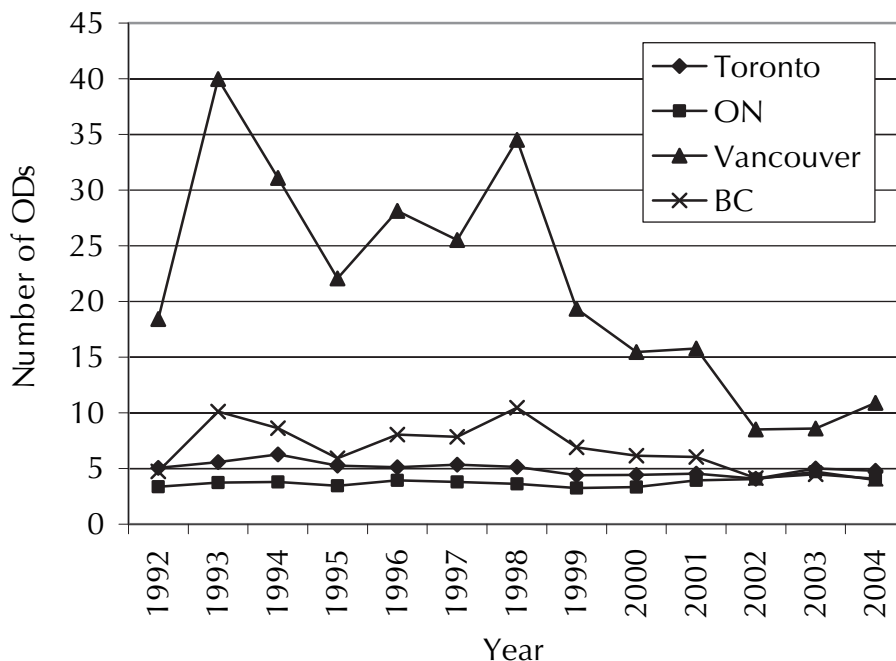


Figure 1. Number of drug-related overdose deaths (ODs) per 100,000 in the City of Toronto, the Province of Ontario (ON), the City of Vancouver, and the Province of British Columbia (BC), 1992-2004

1. OD figures are based on data from provincial coroners' offices; population numbers are based on data from Statistics Canada.
2. Numbers for ODs in Toronto and Vancouver are included in Ontario and British Columbia figures, respectively.
3. OD numbers for Toronto and Ontario in 2003 and 2004 are preliminary.

Toronto from 1992-1995 are based on the 1996 census boundaries.

Linear regression with year as independent variable was used to assess time trends; paired t-tests were used to ascertain differences between jurisdictions with regards to annual OD mortality cases.

RESULTS

Overall, the comparison of the rates of OD incidents in the cities of Toronto and Vancouver in the 1990s (see Figure 1) shows significant differences in these values (mean difference between cities: 16.5 OD deaths per 100,000 population; 95% CI = 11.2-21.6); similarly, significant differences are found for the comparison of provincial OD rates between Ontario and BC (mean difference between provinces: 3.0 OD cases per 100,000 population; 95% CI = 1.6-4.4). The over-time examination of the data furthermore indicates that in BC, after rapidly rising and peaking in 1998, drug use-related OD incident rates have since been cut by more than half. Furthermore, the OD ratio between Vancouver and BC overall has been

reduced from 4:1 to 2:1, emphasizing that the relative proportion of OD in Vancouver compared to the provincial level has fallen dramatically. This trend is highly statistically significant (decrease in ratio per year: 0.16; 95% CI: 0.12-0.21). In contrast, both the OD rates in the jurisdictions of Toronto and Ontario have remained at lower levels throughout the study period. More specifically, while urban Toronto has seen a slight (yet significant) decline in OD incident rates (average rate decline 0.10 deaths per 100,000 population; 95% CI: 0.02-0.17), a slight (and non-significant) increase for Ontario has been evident for the past couple of years, rendering Toronto's and Ontario's OD rates virtually identical at the end of the observation period.

DISCUSSION

The above observations suggest conclusions for epidemiology and interventions, although clearly they are of a speculative nature given the simple and descriptive nature of our study. First, the over-time data for the jurisdictions of study challenge

the predominant view that OD incidents occur disproportionately in large cities, as rates in Toronto and Ontario are virtually the same. Second, it is striking that after massive increases, OD rates in Vancouver have been reduced to levels not seen since the early 1990s. Likely, the establishment or substantial expansion of key interventions has crucially contributed to this effect. For example, the number of persons in methadone maintenance treatment (MMT) in BC has increased more than threefold between 1995 and 1999.²⁴ In addition, BC paramedics were authorized and equipped in the late 1990s to administer naloxone as an on-the-spot intervention for overdose incidents, and outreach programs – like the street nurse outreach program – in Vancouver were expanded and are contributing to the downward effects.^{15,25} At the same time, it also needs to be asked to what extent possible changes in drug users' behaviours as opposed to external interventions may have played their part in the observed reduction of OD incidents. For example, data suggest a reduced involvement of opioids and alcohol, yet an increased involvement of cocaine in fatal OD incidents in BC over the study period.^{16,17} Conversely, OD mortality rates in Ontario and Toronto have either not or only slightly decreased in the time period examined; this despite the fact that relevant treatment interventions – especially MMT – in both these jurisdictions have been expanded on a scale similar to that of BC.²⁶⁻²⁸ Perhaps even more noteworthy, despite such expansions, is the development of increasing rates of OD cases across Ontario. This (albeit weak) trend may point to the critical role of the quality of interventions provided; specifically, there have been concerns in the past few years with regard to quality control in MMT in municipalities (outside of Toronto) across Ontario, where several cases of methadone-related deaths have been reported; these latter may have kept non-Toronto OD rates at higher levels.²⁹ The upward trend may also point to potential key behavioural changes among drug users, e.g., the use of riskier drug combinations.

Subsequent observations may be able to examine how far OD rates in BC may be pushed downward; they will need to consider additional interventions, including a

recently established (2003) Safer Injecting Facility and an experimental heroin prescribing program (2005), which have been implemented in the province post-2002.^{30,31} Given the significance of mortality in drug use-related harms, further in-depth analysis of OD rates across Canada is essential for evidence-based policy development.

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RÉSUMÉ

Objectif : Nous avons voulu comparer les taux de décès par surdose liés aux drogues (l'un des principaux méfaits de la consommation de drogues illicites) en Colombie-Britannique et en l'Ontario et dans les deux plus grandes villes de ces provinces (Vancouver et Toronto) entre 1992 et 2004.

Méthode : Nous décrivons et comparons les données des coroners provinciaux sur les décès par surdose liés aux drogues en C.-B. et en Ontario, ainsi que dans les villes de Vancouver et de Toronto.

Résultats : Après les fortes hausses enregistrées pendant la première partie de la période d'observation, les taux de décès par surdose en C. B. ont baissé; de plus, en raison d'importantes baisses des cas de surdose à Vancouver, la part de Vancouver dans les décès par surdose enregistrés en C. B. a considérablement diminué. Réciproquement, les taux de décès par surdose en Ontario, relativement faibles au départ, sont restés stables, alors qu'ils ont légèrement diminué à Toronto pendant la période d'observation.

Interprétation : L'instauration et le développement récents de mesures de traitement et de réduction des méfaits semblent avoir influé sur la baisse des décès par surdose en C. B., mais on ne voit pas clairement pourquoi ces effets ne se sont pas manifestés à une échelle aussi grande en Ontario, où l'on a pourtant instauré des mesures semblables. Il faudrait surveiller les taux de surdose dans les provinces et territoires du Canada pour pouvoir élaborer des politiques fondées sur des données factuelles.

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Received: May 16, 2005
 Accepted: December 2, 2005



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