Commentary

It's time for Canadian community early warning systems for illicit drug overdoses
Sarah J Fielden*1 and David C Marsh2

Address: 1Department of Interdisciplinary Studies, Institute of Health Promotion Research, University of British Columbia, 2206 East Mall, LPC 435, 4th Floor, Vancouver, BC, V6T 1Z3, Canada and 2Vancouver Coastal Health, 200-520 West 6th Ave, Vancouver, BC, V5Z 4H5, Canada

Email: Sarah J Fielden* - sjfielden@yahoo.ca; David C Marsh - david.marsh@vch.ca
* Corresponding author

Abstract

Although fatal and non-fatal overdoses represent a significant source of morbidity and mortality, current systems of surveillance and communication in Canada provide inadequate measurement of drug trends and lack a timely response to drug-related hazards. In order for an effective early warning system for illicit drug overdoses to become a reality, a number of elements will be required: real-time epidemiologic surveillance systems for illicit drug trends and overdoses, inter-agency networks for gathering data and disseminating alerts, and mechanisms for effectively and respectfully engaging with members of drug using communities. An overdose warning system in an urban area like Vancouver would ideally be imbedded within a system that monitors drug trends and overdoses by incorporating qualitative and quantitative information obtained from multiple sources. Valuable information may be collected and disseminated through community organizations and services associated with public health, emergency health services, law enforcement, medical laboratories, emergency departments, community-based organizations, research institutions and people with addiction themselves. The present paper outlines considerations and conceptual elements required to guide implementation of such systems in Canadian cities such as Vancouver.

Background

Illicit drug use in Canada is responsible for significant costs – both in terms of human life and healthcare resources [1,2]. The number of injection drug users alone has been estimated at 60,000–90,000 in Canada [3] and overdoses are a major cause of death in this group [3-5]. Studies indicate that drug users commonly experience and witness drug overdoses [6-8]. However, the current drug information systems provide inadequate measurement of illicit drug trends and lack the ability to detect problems and initiate a timely response to drug-related hazards such as overdoses. The present paper outlines considerations and conceptual elements for improved systems. The proposed approach pushes beyond distal epidemiological monitoring of drug trends by emphasizing a very proximal threat to public health, overdose. In this way, overdose functions as both an important indicator within drug surveillance systems as well as a health outcome requiring timely communication, intervention and preventative strategies.

Discussion

The Substantial Risks and Repercussions of Drug Overdose
In addition to the tragedy of overdose fatality, non-fatal overdoses amongst people with addiction users occur frequently and have been associated with high morbidity. Direct morbidity with heroin for example can include: peripheral neuropathy, gastro-intestinal problems, tem-
Current Drug Surveillance Systems Are Not Enough

Unfortunately, data surrounding drug trends and overdose prevalence and prevention remains fragmented, incomplete, and untimely in Canada and elsewhere. The US Centre for Disease Control has defined epidemiologic surveillance as "the ongoing systematic collection, analysis, and interpretation of health data essential for planning, implementation, and evaluation of public health practice, closely integrated with the timely dissemination of these data to those who need to know" [24]. In the case of illicit drug trends, no such system currently exists in Canada. The Canadian Community Epidemiologic Network on Drug Use (CCENDU) [25] tracks drug use trends in Canada using various information sources such as cohort studies, vital statistics, Ambulance Service data, population surveys, police crime statistics, and data from the Coroners Service. While this provides valuable information regarding overall past drug trends and interventions in specific areas of the country, it seems to lack the cohesion, completeness infrastructure and ability to detect and alert people in a community to drug-related hazards in a timely and coordinated manner.

Internationally, several surveillance systems are in place and could inform the development of Canadian drug information systems. However, these have limitations with regards to providing an ongoing and timely response mechanism that would be necessary to address an outbreak of overdoses. Surveillance systems for tracking drug trends include drug monitoring systems in Australia, Europe, South Africa, and the United States [19,26-30]. These use a variety of data sources such as urine and blood specimens from adult and juvenile offenders, drug use surveys, emergency department blood and urine toxico-
and utilizing both organizational systems and human net-
tive strategies for monitoring drug trends and overdoses not necessarily preclude an early warning system for over-
response in communities. However, these challenges do
These factors may also hinder a rapid public health
alarms, and knowledge being "trapped" within agencies.
methodological complexity, the danger of raising false
issues such as sociopolitical contexts, lag-time of publications,
sectors. This includes timely access to drug testing for
information on drug quality (e.g., type and purity) and
information from authorities such as the theft of pharmace-
icals (e.g., from a pharmacy break-in). Including this
information in an emergency warning system could act as
a type of symptomatic surveillance system similar to mon-
itoring over the counter purchases of cold remedies to pre-
dict an outbreak of influenza before it occurs [33].
Combined qualitative and quantitative information such as
numbers of overdoses, unusual symptoms, location of
overdoses, suspicious drugs seized by police, drug-related
ambulance calls, and clinical observations in the ERs,
could be reported, collated and analyzed on a daily basis
as a front-line mechanism for rapidly detecting potential
problems. Collection of data need not be limited to a sin-
le source such as hospitals since pooling data from all
these sources could provide a more complete picture of
the potential for an overdose outbreak. Reports from
police, ambulance, outreach workers, healthcare workers,
non-governmental organizations, general practitioners,
emergency wards, and poison control could reduce the
likelihood of information gaps and facilitate timely
assessment of risk and a public health response. Each
source of overdose information could report events (e.g.,
via telephone, fax, electronic forms, etc.) to a central loca-
tion where they could be compared to averages to identify
a potential deviation from normal. When this information
is combined with qualitative reports, experts would
be able to make decisions and disseminate and alert in
consultation with local service agencies and people with
addiction. The Canadian Adverse Drug Reaction reporting
system [34] whereby consumers, healthcare professionals,
and agencies can provide quantitative and qualitative
reports regarding side effects of legally approved drugs
and potentially activate a course of action such as issuing
consumer reports might be a useful model and an
untapped resource in the development of an early warn-
ing system for overdoses.

Inter-agency Communication Networks are Needed
Canadian drug information systems should aim to
address overdose risk as quickly as possible by using both
quantitative and qualitative information from multiple
sectors. Griffith and colleagues [31]. The authors describe the coordinated
effort of 15 emergency departments that were in operation
for the 2000 Sydney Olympics. An Olympic Coordination
Centre was established, equipped with a 24-hour phone
line and connected with various services including the
police and ambulance services. Self-report data regarding
conditions related to illicit drugs were sent electronically
within 24 hours of presentation in the emergency depart-
ments, collated and analyzed within hours, and then sent
to a committee of public health experts. This type of sys-
tem could be used to detect and potentially prevent over-
doses by identifying problems immediately when
abnormal patterns begin to appear in hospitals and com-
municating information back to consumers and other rele-
vant agencies and professionals. With the 2010
Olympics taking place in Vancouver, this strategy seems
feasible during the two week duration of the games; how-
ever, the feasibility of maintaining such a sentinel surveil-
ance system over a long period of time may be limited by
issues such as operational costs.

Despite the individual limitations of these international
surveillance systems in terms of feasibility, comprehen-
siveness, accuracy, and/or ability to provide timely informa-
tion back to communities, they illustrate possibilities
and pitfalls that can inform the development of Canadian
drug information systems. Griffith and colleagues [31]
provide a comprehensive overview of the difficulties asso-
ciated with current drug information systems and early
detection of new drug trends. They suggest that effective
drug information systems are challenged by many factors
such as sociopolitical contexts, lag-time of publications,
methodological complexity, the danger of raising false
alarms, and knowledge being "trapped" within agencies.
These factors may also hinder a rapid public health
response in communities. However, these challenges do
not necessarily preclude an early warning system for over-
doses. They highlight the need to be creative and use mul-
tiple strategies for monitoring drug trends and overdoses
and utilizing both organizational systems and human net-
works to collect and disseminate information.

Community Involvement is Essential
In accordance with the goals of health promotion and
public health, representatives from marginalized popula-
tions should be enabled and empowered to improve their
own health. The Ottawa Charter, a seminal document in
Canadian health promotion policy, states that health serv-
ices should be reoriented towards promoting health and
sharing power with other sectors, other disciplines, and
"most importantly with people themselves" and that the
community should be accepted as "the essential voice in
matters of its health, living conditions and well-being"
[35]. The implications for the aforementioned system to

Logical screening, key informant interviews, focus groups
and ethnographic studies. Many combine qualitative and
quantitative data to provide more complete assessment of
trends and risk. Drug purity data may be ascertained
through drugs seized by police or through consumers pro-
viding samples that they have purchased (e.g., the Nether-
land’s Drug Information Monitoring System or DIMS).
Some of these organizations provide weekly or monthly
reports although much of the reporting is done on an
annual basis.

One of the more responsive systems in terms of monitor-
ing and notification of illicit drug reactions described in
the literature is the surveillance system outlined by Indig
and colleagues [32]. The authors describe the coordinated
effort of 15 emergency departments that were in operation
for the 2000 Sydney Olympics. An Olympic Coordination
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tiple strategies for monitoring drug trends and overdoses
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works to collect and disseminate information.
prevent overdoses include involving people with drug addiction in both the reporting mechanism for exceptionally hazardous substances circulating in their communities and by targeting them in the dissemination of warnings and alerts once a threat has been detected. Involvement of people with addiction in the planning and implementation of such systems would be consistent with the recently articulated position of the Canadian Public Health Agency (“Nothing About Us Without Us”) [36]. Aside from the occasional alert that is provided to the public through a sensationalized media, these types of formalized systems have not been reported. Instead, informal systems are currently responsible for spreading the warning by word of mouth through limited social networks and agency representatives that receive the warning from their clients. Although skeptics may argue that people with addiction will only use information to seek out the offending substance and cause themselves further harm, the scant evidence available suggests that only a minority of users will look for drugs they perceive as more potent [20]. Other people with addiction will likely take precautions and this could be true even for those who try to locate the drugs in question. The better informed that people are of the characteristics of the substance and the potential risks, the better able they are to make informed choices about their drug use. Involving people with addiction in the reporting and disseminating of overdose information increases the likelihood that problems are detected quickly and that messaging will be appropriate and meet the needs of the community.

Although little is known about the information networks in the drug using community, research has suggested that users learn about drug warnings through the televised and printed media, as well as from healthcare program staff, and "on the street" [20,22]. Given that many drug overdoses are never reported to emergency health services, drug users themselves may be made aware of overdose problems before anyone else becomes alerted to them. Although most overdoses are witnessed by others, bystanders will delay or neglect to seek appropriate medical assistance for reasons such as fear of arrest [37,38]. Studies indicate that many overdoses do not involve calling the ambulance or going to the hospital. For example, a recent study using data from the Vancouver Injection Drug User Study, indicated that ambulance personnel assisted in only 54% of non-fatal overdoses and only 57% were taken to hospital [39]. In addition to creating an environment that supports and enables users to seek timely medical assistance in the case of drug overdoses, promoting help-lines for adverse illicit drug reactions and encouraging users to report problems to trusted community-based organization personnel could be valuable strategies. Community-based organizations may also serve as depositories for suspected problem drugs that could undergo testing. Such a reporting mechanism could also represent another opportunity to connect drug users to harm reduction services and much needed treatment referrals.

Conclusion

In summary, given that both fatal and non-fatal overdoses pose a significant public health concern in Canada, implementation of accurate and timely systems for monitoring and responding to drug trends and health outcomes is warranted. A local system including an urban area like Vancouver would ideally involve real-time epidemiological surveillance of drug trends and overdoses incorporating qualitative and quantitative information obtained from institutions such as emergency health services, law enforcement, laboratories, emergency departments, community-based organizations, research institutions and people with addiction themselves. Targeted warnings could be issued to various stakeholders in health, government, and the community who could then determine appropriate responses such as a mass public health warning, enhanced dissemination of harm reduction education and material, or engaging in personal risk reduction behaviours. These types of systems would complement other Canadian strategies that have been implemented to reduce drug-related harms such as methadone maintenance therapy, supervised injection facilities, needle exchange programs, and harm reduction education programs for people with addiction, meant to promote health and safety in the drug using community.

Competing interests

The author(s) declare that they have no competing interests.

Authors’ contributions

SF conceived of the commentary and had the role of primary author in drafting and revising the manuscript. DM contributed to the intellectual content and revision of the document. Both authors read and approved the final manuscript.

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