How Many People in Canada Use Prescription Opioids Non-medically in General and Street Drug Using Populations?

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ABSTRACT

Objective: Medical prescriptions for opioids as well as their non-medical use have increased in Canada in recent years. This study aimed to estimate the number of non-medical prescription opioid (PO) users in the general and street drug using populations in Canada.

Methods: The number of non-medical PO users among the general population and the number of non-medical PO users, heroin users, or both among the street drug using population was estimated for Canada and for the most populous Canadian provinces. Different estimation methods were used: 1) the number of non-medical PO users in the Canadian general population was estimated based on Canadian availability data, and the ratio of US availability to non-medical PO use from US survey data; 2) numbers within the street drug using population were indirectly estimated based on overdose death data, and a key informants survey. Distribution and trends by usage of opioids were determined by using the multi-site Canadian OPICAN cohort data.

Results: Between 321,000 to 914,000 non-medical PO users were estimated to exist among the general population in Canada in 2003. The estimated number of non-medical PO users, heroin users, or both among the street drug using population was about 72,000, with more individuals using non-medical PO than heroin in 2003. Based on data from the OPICAN survey, in 2005 the majority of the street drug using population in main Canadian cities was non-medical PO users, with the exception of Vancouver and Montreal. A relative increase of 24% was observed from 2002 to 2005 in the proportion of the street drug using population who used non-medical POs only.

Discussion: There is an urgent need to further assess the extent and patterns of non-medical prescription opioid use, related problems and drug distribution channels in Canada.

Key words: Analgesics; prescription; opioid; abuse; Canada.

In the past decade, the substantial rise in medical use of prescription opioids (PO) has been accompanied by a marked rise in non-medical use of these drugs in Canada1 and the US.2-5 In 2005, Canada ranked first in the world in per capita consumption of Hydromorphone, second for Morphine and Oxycodeone, and third for Hydrocodeone.6 According to the International Narcotics Control Board, the diversion and abuse of opioid analgesics are increasing in Canada, although the exact extent of the problem is not known.6 There are, however, some indications that the increased medical use of opioids has been accompanied by increased non-medical use of these drugs, coupled with increased levels of opioid dependence and overdose with consequent morbidity and mortality.7-10 A recent cross-sectional US survey demonstrated that 13% of those who reported past-year non-medical PO use (about 1.3 million people) met criteria for PO abuse or dependence.2 Moreover, in Ontario, Canada there were 20 fentanyl (a synthetic opioid analgesic)-related deaths in 2002, whereas in 2003 and 2004, there were 35 and 57, respectively.10 In the United States, unintentional opioid analgesic poisonings increased more than 91% between 1999 and 2002.11

Canada lacks data on the number of non-medical users of POs; therefore, the present study aimed to estimate for Canada and the country’s four most populous provinces – Alberta (AB), British Columbia (BC), Ontario (ON) and Quebec (QC) – for the year 2003: 1) the number, in the general population, of non-medical PO users, and 2) the number and trends, in the street drug using population, of: a) non-medical PO use, b) heroin use, and c) both non-medical PO use and heroin use.

METHODS

This study focused on the estimation of the numbers of non-medical PO users in either the general population or the street drug using population. The study did not examine any medical use, i.e., use of opioids exactly as prescribed regardless of whether the patient met the criteria of ‘dependence’ as defined by the Diagnostic and Statistical Manual of Mental Disorders.12

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that the opioid-related overdose mortality rate tends to stay con-
first approach (for methodology, see ref. 19) is based on the fact
Two complementary approaches were used for this estimation. The
Number of non-medical PO users in the general population
There are no survey-based data of the number of non-medical PO
users in the general population in Canada. Therefore, US data from
different sources were used as a basis for estimates and projections
for Canada for 2003.

The following US data were used:
1. Number of individuals who used POs non-medically in the past
year (2004): 11.3 million;13
2. Estimated number of individuals who abuse heroin: 800,000;14,15
3. Number of individuals who received treatment for heroin abuse
in 2003: 281,000.16

In order to extrapolate an approximate range of the number
of non-medical PO users in the general population in Canada, the
ratios for the US estimates of non-medical PO users to the number
of heroin abusers (to estimate a lower limit) and to heroin abusers
who received treatment (to estimate an upper limit) were deter-
m"ned. This resulted in ratio figures of 14.1:1 and 40.2:1, respectiv-
ly. These US-based ratios were first adjusted by 1) the ratio of
average consumption of narcotic drugs in Canada and US (12,545
DDD/ 29,500 DDD=42.5%, DDD= Daily Defined Doses) and then
2) by population, to estimate values for the 15-49 years age group,
which scaled down the ratios to 3.8:1 and 10.9:1, respectively. Cana-
dian and US average consumption of narcotic drugs for the years
2002-2004 were obtained from the INCB17 (Table XIV

To estimate the number of non-medical PO users in the general
population for the 15-49 years age group, these ratios were multi-
plied by a recent estimate (based on the key informants survey18 of
Canadian illegal opioid users between 15-49 years) in order to deter-
m"n a lower and an upper range of non-medical PO users in the
general population in Canada. Lower and upper limit estimation
was based on the assumption that the proportion of the heroin
abusing population with or without treatment within the entire
non-medical PO using population would be more or less similar in
North America.

Number of regular illegal opioid and/or non-medical PO
users among the street drug using population
Two complementary approaches were used for this estimation. The
first approach (for methodology, see ref. 19) is based on the fact
that the opioid-related overdose mortality rate tends to stay consist-
ently between 1% and 2% per annum (see a meta-analysis20,21). Based
on this assumption, we calculated back from overdose deaths
to the street drug using population in Canada. It has been shown
in the past that coroners’ data give a more realistic picture of over-
dose deaths in Canada than the official mortality statistics of Sta-
tistics Canada,22 which seem to miss a considerable portion of
drug-attributable overdoses. Provincial chief coroners reported 958
overdose deaths (excluding suicidal cases) in Canada in 2002. Unfortunately, most of the Chief Coroners’ reports did not have age/sex specifications for drug overdose. When these data
were not available, we statistically estimated these distributions
according to sex-age group distributions of Canada available from
Statistics Canada.23

The second approach was based on a provincial key informants
survey aimed to determine the prevalence of regular illegal opioid
and/or non-medical PO users in Canada that was conducted
between December 2003 and April 2004. Illegal opioid use was
defined as the regular use of at least one type of opioid which was
not medically prescribed to the user or not used as prescribed. The
survey was sent to 35 select key informants in all provinces and ter-
ritories of Canada who were requested to base their estimates on
the best available provincial statistics. In total, 18 informants
(5 ministerial officials, 4 field researchers, 7 drug addiction pro-
gramme coordinators and 2 treatment consultants) sent back their
completed questionnaires (for detailed methodology, see ref.18).

Distribution and trends of non-medical PO users, heroin
users, and both in the street drug using population
The distribution and trends of usage of opioids were examined by
using data from the multi-site Canadian OPICAN cohort.24,25 This

<table>
<thead>
<tr>
<th>Provinces</th>
<th>Population</th>
<th>Regular Illegal PO Users*</th>
<th>Regular Illegal PO Users†</th>
<th>Non-medical PO Users (lower limit)†</th>
<th>Non-medical PO Users (upper limit)†</th>
<th>Non-medical PO Users per 100,000 Population (lower limit)</th>
<th>Non-medical PO Users per 100,000 Population (upper limit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alberta</td>
<td>1,726,518</td>
<td>10,000</td>
<td>38,307</td>
<td>109,058</td>
<td>2219</td>
<td>6317</td>
<td>5582</td>
</tr>
<tr>
<td>British Columbia</td>
<td>2,142,038</td>
<td>20,000</td>
<td>76,613</td>
<td>218,116</td>
<td>3577</td>
<td>10,183</td>
<td>3139</td>
</tr>
<tr>
<td>Ontario</td>
<td>6,366,193</td>
<td>30,000</td>
<td>114,920</td>
<td>327,174</td>
<td>1805</td>
<td>2859</td>
<td>5139</td>
</tr>
<tr>
<td>Quebec</td>
<td>3,814,456</td>
<td>10,000</td>
<td>38,307</td>
<td>109,058</td>
<td>1004</td>
<td>2859</td>
<td>5139</td>
</tr>
<tr>
<td>Canada</td>
<td>16,372,157</td>
<td>83,800</td>
<td>321,009</td>
<td>913,905</td>
<td>1961</td>
<td>5582</td>
<td>5582</td>
</tr>
</tbody>
</table>

† Based on provincial key informant data18
* Based on the US data (see methodology)

Figure 1. Number of non-medical PO users among general population and number of non-medical PO users, heroin users and both in the street drug using population in Canada, 2002-2003

Sum of users among the street drug using population estimated based on provincial coroners reports (right column)
Distribution based on 2005 OPICAN cohort
PREVALENCE OF OPIOID ABUSE IN CANADA

The study assessed local samples of illegal opioid (and other) drug abusers in Vancouver, Edmonton, Toronto, St. John’s, Quebec City, Montreal, Fredericton, and Quebec between 2002 (baseline) and 2005 (3rd follow-up), involving a sample of 585 participants. The main eligibility criteria for participation in the OPICAN cohort were: 1) having abused illegal opioids for a minimum of 1 year on the majority of days in the week, and 2) not having been in a drug treatment program in the previous 6 months.

Self-reported use in the past 30 days of the following opioids was included: Demerol, Dilaudid, Methadone (illegal from street), Morphine, OxyContin, Percocet, and Tylenol 3 or 4.

To carry out the distribution of street opioid abuse by subgroups: POs-only, heroin-only, and combined POs and heroin, the proportions from the above three user types within the street drug using population of the OPICAN cohort were applied to the midpoint estimate of the number of regular illegal opioid and/or non-medical PO users (based on provincial coroners' reports).

RESULTS

Number of non-medical PO users in the general population

It was estimated that in Canada there were between 321,000 to 914,000 non-medical PO users between the ages of 15 and 49 years in the year 2003. Among select provinces, British Columbia was found to have the highest rate of non-medical PO users per 100,000 population, followed by Alberta, Ontario and Quebec (Table 2).

Number of regular illegal opioid and/or non-medical PO users among the street drug using population

Based on provincial coroners reports (23) and provincial key informant data (18), the following estimates were calculated:

- Number of non-medical PO-only users
- Number of heroin-only users
- Number of non-medical PO and heroin users
- Total number of non-medical PO, heroin users and both

Table 2. Number of People with Regular Illegal Opioid and/or Non-medical PO Use among the Street Drug Using Population in Select Provinces and Canada (15-49 years of age), 2002-2003

<table>
<thead>
<tr>
<th>Population of Canada</th>
<th>AB</th>
<th>BC</th>
<th>ON</th>
<th>QC</th>
<th>Canada</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>F</td>
<td>Total</td>
<td>M</td>
<td>F</td>
<td>Total</td>
</tr>
<tr>
<td>817,585</td>
<td>801,510</td>
<td>1,619,095</td>
<td>989,575</td>
<td>1,014,450</td>
<td>2,004,025</td>
</tr>
<tr>
<td>74</td>
<td>22</td>
<td>96</td>
<td>96</td>
<td>29</td>
<td>125</td>
</tr>
<tr>
<td>3710</td>
<td>1100</td>
<td>4810</td>
<td>4790</td>
<td>1480</td>
<td>6250</td>
</tr>
<tr>
<td>7410</td>
<td>2210</td>
<td>9620</td>
<td>9570</td>
<td>2950</td>
<td>12,500</td>
</tr>
<tr>
<td>5560</td>
<td>1655</td>
<td>7215</td>
<td>7180</td>
<td>2215</td>
<td>9375</td>
</tr>
<tr>
<td>680</td>
<td>206</td>
<td>446</td>
<td>726</td>
<td>218</td>
<td>468</td>
</tr>
<tr>
<td>6660</td>
<td>3330</td>
<td>10,000</td>
<td>13,320</td>
<td>6660</td>
<td>20,000</td>
</tr>
<tr>
<td>2622</td>
<td>1124</td>
<td>3745</td>
<td>490</td>
<td>210</td>
<td>700</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>9072</td>
<td>3888</td>
<td>12,960</td>
</tr>
<tr>
<td>571</td>
<td>245</td>
<td>816</td>
<td>2547</td>
<td>1091</td>
<td>3638</td>
</tr>
<tr>
<td>3193</td>
<td>1368</td>
<td>4561</td>
<td>12,109</td>
<td>5189</td>
<td>17,298</td>
</tr>
</tbody>
</table>

* Based on provincial coroners reports
† Based on provincial key informant data
‡ Sum estimated based on provincial coroners reports and distribution estimated based on 2005 OPICAN cohort
PO – prescription opioids
AB – Alberta; BC – British Columbia; ON – Ontario; QC – Quebec

Note: The final estimate was based on the subjective key informant estimates.
and combined non-medical PO and heroin users 23.2%), and applying these proportions with a midpoint estimate of number of regular illegal opioid and/or non-medical PO users of 71,850 (based on provincial coroners’ reports; Table 2), it was estimated that more individuals used non-medical POs (35,000) than heroin (20,000) or the combination of the two (17,000) in Canada in 2003 (Figure 1).

Heroin use was highly prevalent in the large cities of Vancouver (71%) and Montreal (48%) while the non-medical PO use was highly prevalent among the respondents in three other cities, Edmonton (89%), Quebec City (88%) and Toronto (75%). The highest proportion of combined heroin and non-medical PO use was found among respondents in Montreal (37%), followed by Toronto (24%), Vancouver (22%), Quebec City (12%), and Edmonton (11%) (Figure 2).

**Trends of non-medical PO users, heroin users, and both in the street drug using population**

Data from the OPICAN survey showed that between 2002 and 2005 in Canada, there was an overall increase of 24.3% in the proportion of respondents who used non-medical POs only, with a 6.5% and 7.5% decrease in the proportion of heroin only users and combined non-medical PO and heroin users, respectively (all statistics were significant at p<0.001) (Table 3).

The highest relative increase non-medical PO only use was observed among respondents in Edmonton (23.9%, p<0.05). The relative proportion of heroin only use decreased significantly among respondents in both Montreal (13.9%, p<0.05) and Vancouver (14.8%, p<0.05).

**DISCUSSION**

This study has several limitations. First, the validity of the estimates depends on various assumptions. For example, the estimation of non-medical PO use in the general population in Canada was based in part on US data. In addition, the lower and upper limit estimation was based on the assumption that the proportion of the heroin abusing population with or without treatment within the entire non-medical PO using population would be more or less similar in North America.

Furthermore, the OPICAN data were obtained by self-report, a method subject to potential biases, though widely noted to be relatively accurate, even on sensitive topics such as drug use. The data from key informants might also be subjective and biased with their own impressions or influenced by personal relationship between informants and researcher.

This study estimated that in Canada in 2003, among the general population, there were between 321,000 to 914,000 non-medical PO users and, among the street drug using population, there were about 72,000 non-medical PO users, heroin users or both. Important information is lacking on the proportion of individuals who use these drugs regularly for non-medical use, and what proportion qualifies for dependence. However, even if only a small minority of the non-medical prescription users are dependent, this number would match the street drug abusers.

There are more non-medical PO users than heroin users today because of the apparent ease of acquiring these pharmaceuticals. Thus, the stereotype of the “addict” is changing into a broader definition affecting a larger part of our society.

Based on the observed increase in the population of PO users in the recent past in Canada, survey research is urgently needed to determine, as accurately as possible, the extent and patterns of non-medical PO use and identify those populations most at risk for abusing POs. In addition, in-depth studies need to be carried out that address the leaking out of prescription drugs from the medical system into illegal drug markets and finding ways to reduce such leakage. The next important step is to develop appropriate prevention programs without undermining access to pain treatment.

In addition, there are several strategies that come to mind which aim to prevent prescription drug abuse and need to be urgently implemented in Canada. These include: prescription drug monitoring programs, reduction of improper prescribing practices, edu-

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**Table 3.** Trends of Usage of Non-medical PO-only, Heroin-only, and Both in the Street Drug Using Population in Edmonton (Alberta), Vancouver (British Columbia), Toronto (Ontario), Montreal and Quebec City (Quebec) in the 2002 and 2005 Assessments

<table>
<thead>
<tr>
<th></th>
<th>Edmonton</th>
<th>Montreal</th>
<th>Quebec</th>
<th>Toronto</th>
<th>Vancouver</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>POs-only</td>
<td>23.9%</td>
<td>-4.0%</td>
<td>3.5%</td>
<td>-0.8%</td>
<td>0.0%</td>
<td>24.3%</td>
</tr>
<tr>
<td>Heroin-only</td>
<td>-</td>
<td>-13.9%</td>
<td>-</td>
<td>-1.6%</td>
<td>-14.8%</td>
<td>-6.5%</td>
</tr>
<tr>
<td>Combined POs and heroin</td>
<td>-17.4%</td>
<td>-16.8%</td>
<td>-10.9%</td>
<td>-9.6%</td>
<td>-8.2%</td>
<td>-7.5%</td>
</tr>
</tbody>
</table>

Notes:

* McNemar test used for significance testing (alpha = 0.05)
* **Bold** numbers show statistical significance
* Positive % shows drug abuse increase, whereas negative % indicates decrease in drug abuse in 2005
* – = data were not available for 2005 assessment
PREVALENCE OF OPIOID ABUSE IN CANADA

REFERENCES


RÉSUMÉ

Objectif : Les prescriptions médicales pour les opiacés ainsi que leur utilisation non médicinale ont augmenté au Canada au cours des dernières années. Cette étude vise à évaluer le nombre d’utilisateurs d’opiacés d’ordonnance (OO) non médicaux au sein de la population générale et de la population utilisant des drogues illicites au Canada.

Méthode : Le nombre d’utilisateurs d’OO non médicaux parmi la population générale et le nombre d’utilisateurs d’OO non médicaux, d’utilisateurs d’héroïne ou les deux parmi la population faisant usage de drogues illicites ont été évalués au Canada et dans les provinces canadiennes les plus populueuses. Différentes méthodes d’évaluation ont été utilisées : 1) le nombre d’utilisateurs d’OO non médicaux au sein de la population générale du Canada a été évalué selon les données sur la disponibilité canadienne et le ratio de la disponibilité américaine pour l’utilisation d’OO non médicaux à partir des données des études américaines; 2) le nombre au sein de la population faisant usage de drogues illicites était indirectement évalué selon les données sur le décès par surdose et une étude auprès de répondants clés. La distribution et les tendances selon l’usage d’opiacés ont été déterminées à l’aide des données de cohorte de l’étude OPICAN effectuée dans plusieurs villes canadiennes.

Résultats : On a évalué qu’il y avait entre 321 000 et 914 000 utilisateurs d’OO non médicaux au sein de la population canadienne en 2003. Le nombre évalué d’utilisateurs d’OO non médicaux, d’utilisateurs d’héroïne ou les deux parmi la population faisant usage de drogues illicites était de 72 000, avec davantage de personnes utilisant des OO non médicinaux que l’héroïne en 2003. Selon les données de l’étude OPICAN, en 2005, la majorité de la population faisant usage de drogues illicites dans les principales villes canadiennes était des utilisateurs d’OO non médicaux, à l’exception de Montréal et de Vancouver. Un accroissement relatif de 24 % a été observé de 2002 à 2005 selon la proportion de la population faisant usage de drogues illicites utilisée des OO non médicaux seulement.

Discussion : Il existe un besoin urgent d’évaluer davantage la portée et les modèles de l’utilisation d’OO non médicaux, les problèmes connexes et les réseaux de distribution de drogues au Canada.

Mots clés : analgésiques; ordonnance; opiacé; abus; Canada