

# Regional Variations and Trends in Substance Use & Related Harm in BC

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## Hospitalizations caused by substance use in BC

- In the past 5 years (2003-2007), we estimate there were 89,065 hospitalizations caused by alcohol, 22,381 by illicit drugs, and 134,441 by tobacco.
- From 2002-2007, the rate of hospitalizations caused by illicit drugs has increased 36.6%, and that by alcohol 3.4%. Rates for tobacco decreased 7.8%.

## Deaths caused by substance use in BC

- In the past five years (2002-2006), we estimate there were 4,431 deaths caused by alcohol, 1,814 by illicit drugs, and 22,972 by tobacco in BC.
- The provincial rates of death attributable to alcohol and illicit drugs were relatively stable from 2001-2006, while rates for tobacco were reduced by 9.2%.

## Surveys of high-risk groups in Vancouver and Victoria

- Substances used recently by club/recreational drug users were: alcohol (91%), marijuana (80%), tobacco (62%), ecstasy (55%), and cocaine (42%).
- Substances used recently by adult intravenous drug users were: tobacco (97%), crack (78%), cocaine (70%), marijuana (65%), heroin (60%), alcohol (49%), and crystal meth (43%).
- Substances used recently by street-involved youth were: tobacco (93%), alcohol (82%), marijuana (78%), and ecstasy (43%).

- Crack cocaine use increased across the two survey periods among all three groups combined.
- Potentially dangerous combinations of alcohol and illicit drugs were reported recently by recreational club drug users (38% marijuana, 12.5% cocaine) and adult intravenous drug users (4.1% cocaine).
- Most drugs were reported to be "very easy" or "easy" to obtain for all high-risk survey groups.

## Drug seizure data

- There were dramatic increases in seizures of crack cocaine (1716%), ecstasy (1664%), methamphetamine (767%), and prescription opioids (242%) between 1997 and 2007.
- BC is responsible for 49% of Canada's seized crack and 68% of seized heroin.
- The purity of seized cocaine has been increasing steadily.

## Alcohol consumption

- Per capita consumption of alcohol has risen 8% in only 5 years. Interior Health has the highest rate (11.10 litres pure ethanol per person) and Fraser Health the lowest (7.03).

## Conclusions

BC continues to experience substantial harms associated with the use of legal and illegal substances. The bulk of this harm is associated with legal drugs, principally alcohol and tobacco. There is evidence of increasing use and related harms associated with psycho-stimulant drugs and alcohol, with a declining trend for tobacco.

Figure 1a. Estimated number of substance caused hospitalizations in the past five years (2003-2007) in BC.

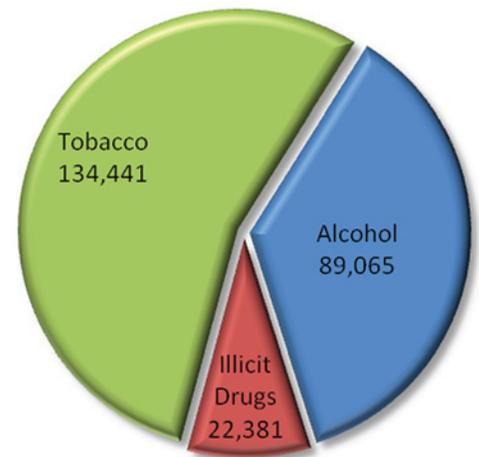
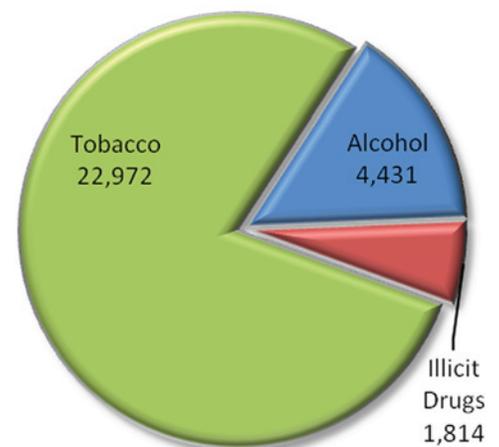


Figure 1b. Estimated number of substance caused deaths in the past five years (2002-2006) in BC.



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## Introduction

Understanding regional variations and trends in drug use and related harms is an essential component of understanding alcohol and drug problems in BC and targeting resources to be of greatest benefit. This bulletin will outline emerging trends and regional variations by health authority in BC using information collected through The BC Alcohol and Other Drug (AOD) Monitoring Project. The AOD project draws from a range of complementary data sources in a comprehensive approach to epidemiological monitoring of alcohol and other drugs use and related harms in BC, including: high-risk population surveys, seized drug analysis, alcohol sales records, and death and hospitalization records. From this information, it is becoming increasingly apparent that use of alcohol and other drugs is characterized by marked regional variation and, in many cases, increasing trends. Furthermore, there are a substantial number of deaths and hospitalizations in BC that can be directly attributed to alcohol and other drugs.

## Hospitalizations Caused by Alcohol and Other Drugs

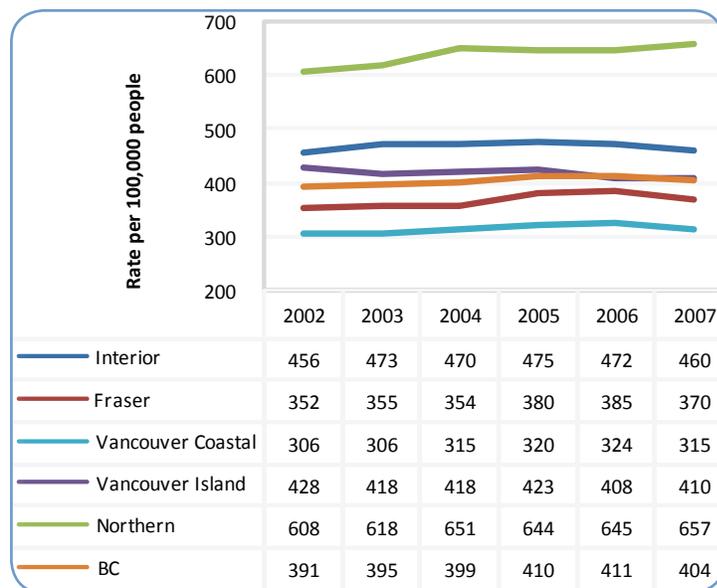
Substance use has significant implications for the health of BC residents and the demand for healthcare resources. The AOD monitoring system obtains hospital discharge information from the BC Ministry of Health to estimate alcohol, tobacco, and illicit drug attributable hospitalizations (raw numbers and age and sex standardized rates) and to help measure the harm associated with these substances using the aetiologic fraction method (Buxton et al., In Press). While it is unclear how hospitalization data is affected by bed availability and changes in hospitalization practice, in the past 5 years (2003-2007), we estimate there were 89,065 hospitalizations caused by alcohol, 22,381 caused by illicit drugs, and 134,441 caused by tobacco (see Figure 1a). As a whole, alcohol caused hospitalizations have increased from 2002 to 2007 by 3.4%<sup>1</sup> ( $p = .046$ ). Geographical regions have distinct differences, however (see Figure 2). For example, the highest rate of alcohol caused hospitalizations in 2007 belongs to Northern Health, at 657/100,000 people, an increase from 608/100,000 in 2002 ( $p = .022$ ). In comparison, the rate of alcohol caused hospitalizations in Interior Health was also considerably above the provincial rate (Interior Health 460/100,000; BC 404/100,000), although it has not shown a significant increase from 2002 to 2007. The provincial rate of tobacco caused hospitalizations has decreased 7.8% from 2003 to 2007 ( $p = .011$ ).

In regards to illicit drugs, the rate of hospitalizations has increased 36.6% from 2002 to 2007 (from 82 to 112 per 100,000 people, see Figure 3) in BC ( $p = .009$ ). The health authority with the largest increase over these years was Northern Health (56.1%). However, an increase in illicit drug caused hospitalizations appears to be a province-wide concern as all other health authorities showed an increase of at least 24% in this time period except for Vancouver Island (3.3%, ns).

## Number of Deaths Caused by Alcohol, Tobacco and Other Drugs

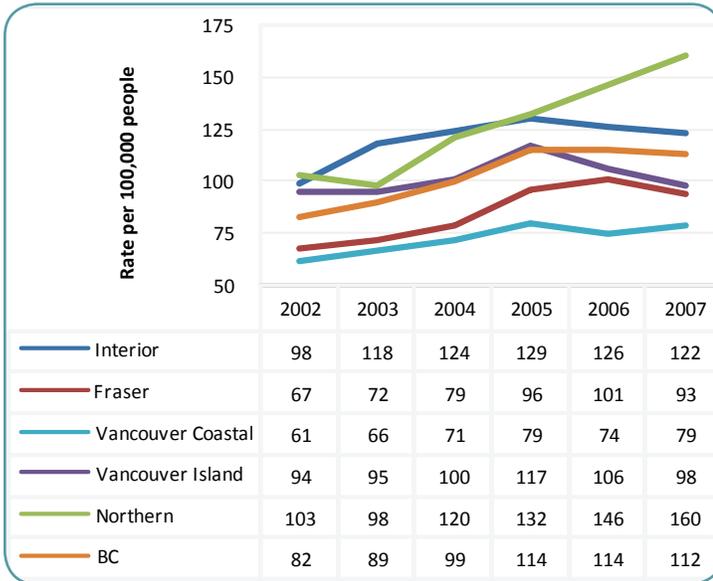
The annual number of substance-caused deaths for the province has also been calculated using data from BC Vital Statistics. In the most recent five years for which information is available (2002-2006), we estimate there were 4,431 deaths caused by alcohol, 1,814 deaths caused by illicit drugs, and 22,972 caused by tobacco (see Figure 1b). It may come as a surprise that to the end of 2006 alcohol still caused more than twice as many deaths as all major illicit drugs combined. By comparison, tobacco still contributes to the most deaths, five times more than alcohol. However, it is important to note that Canadian statistics show that alcohol caused almost double the potential years of life lost per death as tobacco (26.5 vs. 14.4; Single et al, 2000). It is also worth noting that alcohol can be attributed to nearly the same proportion of the worldwide burden of disease

Figure 2. Rate of alcohol attributable hospitalizations by health authority in BC, 2002-2007.



1. This trend consists of an increase in hospitalizations caused by chronic harms (e.g. esophageal cancer, liver cancer, alcoholic psychoses, etc) from a rate of 19.6 in 2002 to 21.6 in 2007, a difference of 9.9% ( $p = .003$ ), but no significant change in hospitalizations caused by acute harms (e.g. accidents, suicides, assaults, etc).

**Figure 3. Rate of illicit drug attributable hospitalizations by health authority in BC, 2002-2007.**



(including premature death, illness, injury, and disability) as tobacco (4.0% vs. 4.1%; Room, Babor, and Rehm, 2005). The provincial rate of deaths (age and sex standardized) attributable to alcohol has been relatively stable from 2001-2006<sup>2</sup>. There are considerable regional variations in trends with Northern Health showing a strong declining trend ( $p = .002$ ), while Vancouver Island Health Authority has shown an upward trend ( $p = .006$ ). Fortunately, in regards to tobacco, mortality rates in BC have been declining ( $p = .011$ ). On the other hand, illicit drug caused mortality rates for BC as a whole have remained relatively unchanged from 2002 to 2006. The highest rates of illicit drug caused mortality in 2006 per 100,000 people were found in Vancouver Coastal (9.63) and Vancouver Island Health Authority (9.69), and the lowest rates were found in Northern Health (4.10)<sup>3</sup>.

### Popularity of Street and Club Drugs in Victoria and Vancouver

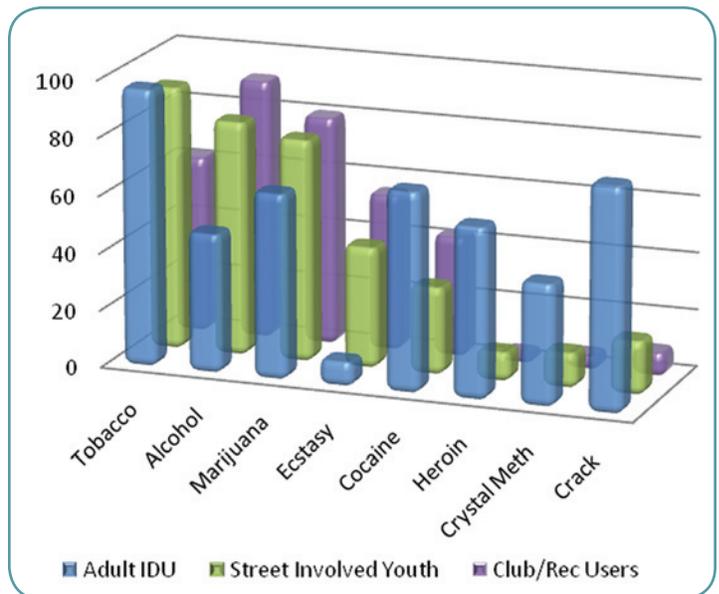
Trends in street and club drug use in Victoria and Vancouver are monitored by semi-annual surveys of three specific and sentinel drug user populations: club/party attendees, street-involved youth, and adult injection drug users (IDU). While not representative of the general population, these surveys are critical to understanding specific drug use patterns and emerging trends among high-risk populations. As can be seen

in Figure 4, from these high-risk population surveys, waves 1 (Jan-May 07) and 2 (Nov 07-Mar 08), we know that the top drugs used in the past 30 days among club/recreational drug users in Victoria and Vancouver are: alcohol (91%), marijuana (80%), tobacco (62%), ecstasy (55%), and cocaine (42%). The most popular drugs used by adult IDU are: tobacco (97%), crack (78%), cocaine (70%), marijuana (65%), heroin (60%), alcohol (49%), and crystal meth (43%). The most popular street-involved youth drugs are: tobacco (93%), alcohol (82%), marijuana (78%), and ecstasy (43%). However, the use of these drugs varies between these two cities. In 2007/2008, for example, the percent of adult IDU who used cocaine in the past 30 days was significantly higher in Victoria (84%) than in Vancouver (56%). As well, as a whole, Vancouver versus Victoria respondents were significantly more likely to have used amphetamine, crystal meth, heroin and magic mushrooms in the past 30 days. The majority of drugs in all cohorts were reported to be “very easy” or “easy” to obtain in wave 2. Finally, there was significantly more crack cocaine use reported in wave 2 than in wave 1.

### Risky Patterns of Use

Data from the high-risk population surveys have shown that drugs are regularly mixed and, at times, in a hazardous fashion.

**Figure 4. Percent of high risk populations in Victoria and Vancouver, BC, reporting the recent use of various substances 2007/2008.**



2. From 2002 to 2006 data show a marginally significant drop in the rate of deaths due to acute conditions related to alcohol from .550 to .457 per 100,000 people ( $p = .066$ ) but no significant change in the rate of deaths due to chronic conditions.

3. For more information of substance related mortality and hospitalization trends or anything else presented in this bulletin please see [www.AODmonitoring.ca](http://www.AODmonitoring.ca).

For example, in regards to alcohol, 38.6% of the club sample reported simultaneous use of both alcohol and marijuana within the previous weekend, and 12.5% reported simultaneous use of alcohol and cocaine. Among the adult injection drug using (IDU) sample, 4.4% reported simultaneous use of alcohol and heroin, a potentially dangerous combination.

### Illicit Drug Seizure Trends in BC

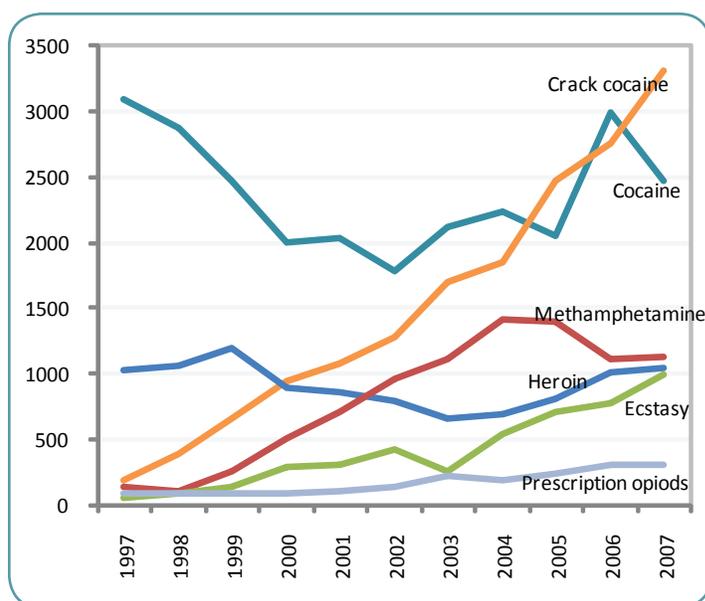
In addition to the surveys to track illicit drug use among sentinel high-risk populations, the AOD project also uses administrative records of seized drugs to generate a complementary profile of trends for BC. This information is obtained through Health Canada's Drug Analysis Service (DAS) Laboratory Information Management System (LIMS). LIMS contains information on the occurrence and chemical composition of suspected illegal substances (exhibits) seized by Canadian police and customs officers nation-wide. Not surprisingly, the most frequent exhibit in BC for 2007 by a large amount was marijuana (6,524 exhibits) followed by crack cocaine (3,305), and cocaine (2,468). While the number of marijuana exhibits was relatively unchanged from 1997 to 2007, the number of crack cocaine exhibits has shown a drastic increase in prevalence (1716%) during this 10-year time period, more evidence that crack cocaine is becoming an increasing problem in BC. Also showing dramatic increases in this time were ecstasy (1664%), methamphetamine (767%), and prescription opioids<sup>4</sup> (242%) which may be replacing demand for heroin, another opioid (see Figure 5). It is interesting to note that these increases far exceed the overall increase in the total number of exhibits from 1997 to 2007 (56%). Finally, while some drugs appear to be becoming more pervasive, other drugs appear to be experiencing a decrease in popularity. For example, there has been a large decrease in seizure frequency for PCP (-92%), hash oil (-75%), LSD (-48%), hashish (-48%), and psilocybin (-31%).

### Proportion of Drugs Seized Nationally

Interestingly, LIMS shows that a number of exhibits from BC are disproportionately represented among national exhibits, high in some case and low in others. For instance, in 2007, 49% of Canada's crack exhibits and 68% of heroin exhibits were from BC. On the other hand, for example, only 1% of PCP and 2% of national amphetamine exhibits were from BC (more data is available at [www.AODmonitoring.ca](http://www.AODmonitoring.ca)).

Information on this disproportion is echoed in data on the quantity of suspected seized drugs collected through a separate database called the Controlled Drugs and Substances Database (CDS) at Health Canada. In regards to crack cocaine, the quantity that is seized in BC makes up 41% of that seized in Canada, which corresponds closely to the proportion of exhibits (49%) mentioned previously and thus serves as further evidence that administrative data on drug seizures may serve as a reliable indicator of trends. For heroin, we know that 99% of liquid heroin (i.e. that measured in milliliters) and 47% of all heroin measured in kg is seized in BC<sup>5</sup>; these high numbers also reflect the exhibit data. Comparisons between BC and Canada also reveal some other intriguing regional variations. Specifically, some forms of drugs recorded in the CDS, such as heroin measured in milliliters, are more likely to be BC seizures than others. Liquid MDMA (a form of ecstasy) is another example; seized liquid MDMA makes up 100% of the liquid MDMA seized in Canada (2007) as does liquid methamphetamine. The implications are that these drugs are being seized at the production level, and therefore BC may have a higher number of production sites than in other parts of the country and perhaps higher availability as well. Notably, there are other potential explanations including the possibility that BC has increased enforcement in these areas, and it is not possible to

**Figure 5. Number of BC exhibits analyzed by the Drug Analysis Service, 1997-2007.**



4. Prescription opioids include: morphine, methadone, pethidine, fentanyl, codeine, oxycodone, hydromorphone, buprenorphine, meperidine, nabilone, pentazocine, propoxyphene, tramadol, sufentanil.

5. There is some variability in recording practices in that some drugs may be recorded in one of several possible measurements category (e.g. capsules, or tablets, or kilograms, etc.); however, amounts listed within a given category are not also recorded elsewhere.

determine the extent of influence of enforcement practices on the LIMS of the CSDS data set.

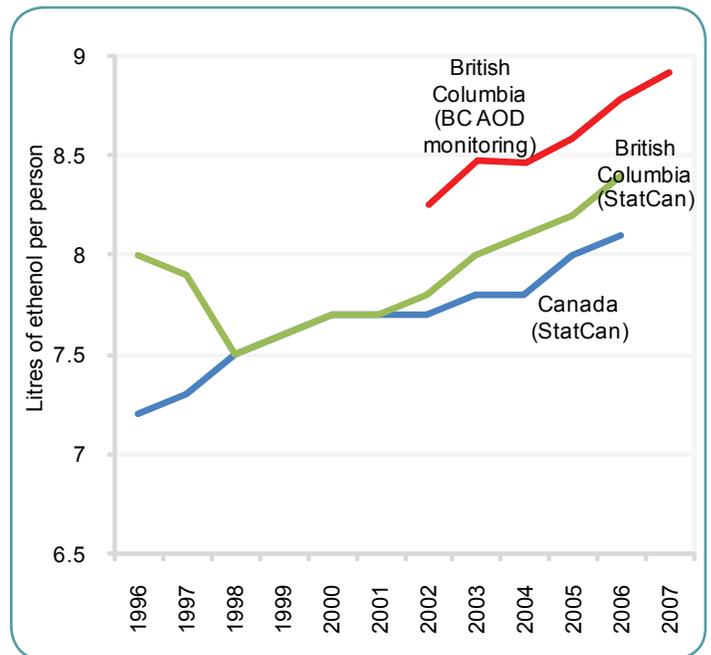
## Comparison of Illicit Drug Purity between BC and Canada

The purity of drugs is a health concern considering that fluctuations in the concentration of a drug may have serious health implications and thus is important for monitoring both substance use and related harms. For example, sudden increases in the purity of heroin may be associated with an increased risk of overdose (see Darke, 1999). Conversely, the presence of adulterants, which may be added with the purpose of enhancing or mimicking the addictive properties of the drug or to add bulk for an increased resale profit (Shesser et al., 1991), may also increase the potential for harmful reactions (for a summary, see Wendel et al., 2003). The LIMS database indicates that in the last eight years (2000-2007) the purity of seized MDMA, which fluctuates wildly, and the purity of heroin have shown a slight downward trend in BC. While the purity of MDMA seized in BC has remained comparable to MDMA seized in Canada (51% vs. 48%), the purity of heroin is substantially lower (34% vs. 48%). Conversely, the purity of cocaine has been increasing steadily in the last eight years in BC and Canada, with BC-seized cocaine still being substantially more pure than nationally-seized cocaine (81% vs. 71%).

## Trends in National and Provincial Alcohol Consumption

While illicit drug use is primarily being tracked through high-risk surveys and seized drug analysis, use of a legal substance—alcohol—is also being tracked, using government sales records and U-Brew/U-Vin data (see Figure 6). Tracking alcohol consumption is critical as research has shown a strong positive correlation between drinking levels and patterns of alcohol use and alcohol related harm (see Babor et al., 2003). The highly comprehensive alcohol sales records from BC and from Canada overall can be used to generate some of the most complete estimates of alcohol consumption possible, and far exceeds the facility of survey generated data which are known to severely underestimate consumption (Stockwell et al., 2004). Moreover, estimates generated by CARBC for BC, which are higher than those generated by Statistics Canada, are also more accurate since they include U-Brew and U-Vin production, include estimates of home-brewed production based on the Canadian Addiction Survey 2004, and use accurate conversion factors for alcohol content (e.g. the average alcohol content in coolers

Figure 6. A comparison of per capita alcohol consumption estimates, 1996-2007.



sold in BC is 6.72%, not 5% as estimated by Statistics Canada). These sales records also indicate that provincial consumption of alcohol has risen more than half a litre (.66 litres pure ethanol/person)<sup>6</sup> from 2002 to 2007, which is significant considering that this is an increase of 8% in only 5 years ( $p < .001$ ). Again, like most other drugs, the use of alcohol shows some regional variation. The highest consumption rate is in Interior Health (11.10) and the lowest rate is in Fraser Health (7.03), and all health authorities show a significant increase in consumption rates from 2002 to 2007 except for Northern Health.

## Conclusions

Overall, there is strong evidence that the consumption of alcohol and some illicit drugs has been rising steadily in British Columbia. However, there is marked regional variation in the rate of growth. Some areas may be experiencing a more rapid increase or have had an elevated rate from the start, while others have reached a plateau or even a decline. It is also apparent that some drugs are more popular among some users, and preferences may vary by city and possibly by province. While caution needs to be exercised in interpreting drug seizure data, these records do give further indication that some drugs—such as LSD—may be experiencing decreased popularity while other drugs—such as crack cocaine and ecstasy—are in an

6. Throughout this report, alcohol consumption is measured in litres of pure ethanol per person aged 15 years and older.

ever-increasing supply. Finally, at the same time as monitoring trends in alcohol and other drug use, it is also essential to watch for trends in related harms. It is increasingly evident that some regions are experiencing a significantly higher degree of substance related illness and death than others and, as such, may experience the greatest benefit from targeted resources.

More detailed information on regional variations and trends, including information on Health Service Delivery Areas and

Local Health Area levels is available at [www.AODmonitoring.ca](http://www.AODmonitoring.ca). As well, watch for data on substance use in adolescence from the McCreary Centre Society's Adolescent Health Survey IV and substance use in the general population from the Canadian Alcohol and Other Drug Use Monitoring Survey (CADUMS) which will be available in the first half of 2009.

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