



Coroners Service

Illicit Drug Overdose Deaths

Literature Review

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LITERATURE REVIEW – Illicit Drug Overdose

The B.C. Coroners Service (BCCS) convened a death review panel on illicit drug overdose to identify a limited number of opportunities to improve public safety and prevent future overdose deaths. This backgrounder provides a brief overview of statistics and literature on illicit drug use and overdose. It is not intended as an exhaustive review on this topic. The literature presented reflects the predominant factors and characteristics noted in the coroner cases reviewed.

DRUG USE PREVALENCE

The misuse of and addiction to illicit drugs is a global problem that affects health, social, and economic welfare (National Institute on Drug Abuse (NIDA), 2014).

International

The United Nations estimates that between 162 million and 324 million people (3.5% and 7.0% respectively) of the world's population (age 15-64) use illegal drugs annually, with an estimated 16 to 39 million being identified as people who use drugs regularly or those with drug use disorders or dependence (United Nations, 2014). Studies estimate that between 26.4 million and 36 million people misuse opioids worldwide (NIDA, 2014). In addition, the literature suggests that among people who use drugs, poly drug consumption is common and individual patterns of use range from experimental to habitual and dependent consumption.

A 2017 report summarizing European data provides recent estimates of illicit drug use. The report indicates that cocaine is the most commonly used illicit stimulant drug in Europe with 5.2% of European adults (age 15-64) having used cocaine at some time in their lives. In addition the report estimated that 4.2% of European adult (age 15-64) have experimented with MDMA and 3.8% of European adults (age 15-64) have experimented with methamphetamines at some time in their lives. In Europe, the most commonly used illicit opioid is heroin. In 2015, the prevalence of high-risk opioid use among European adults was estimated at 0.4%. As well, the report found that synthetic opioids (methadone, buprenorphine, and fentanyl) were increasingly misused (European Monitoring Centre for Drugs and Drug Addiction (EMCDDA), 2017).

In Australia, a 2010 national survey indicated that nearly 40% of Australians over age 14 years had used an illicit substance in their lifetime. The survey found that while cannabis was the most prevalent substance used, heroin and other opiates contribute to over 90% of deaths associated with illicit drug use (Australian Institute of Health and Welfare, 2011).

In the United States, U.S. data suggests that illicit drug use has been increasing. The National Institute on Drug Abuse (NIDA) estimated that 9.4 percent of the American population aged 12 or older had used an illicit drug in the past month, up from 8.3 percent in 2002 (NIDA, June 2015). U.S. data from 2014 was higher with 10.2% of persons age 12 or older had used illicit drugs in the past

month (CDC, April 27, 2016). This change mostly reflects the increase in use of cannabis, the most commonly used illicit drug (NIDA, June 2015).

U.S. data sources also indicate that the use of most drugs other than cannabis has stabilized over the past decade or has declined. In 2013, U.S. cocaine use had decreased but methamphetamine use was higher (NIDA, 2015).

Canada

While surveillance data in Canada are lacking overall in comparison to the U.S., a number of studies provide estimates of illicit drug prevalence in Canada. These estimates may be based on local, regional and national surveys.

A study by el-Guebaly (2014) indicated that Canada's prevalence of illicit drugs among persons 15-64 year was 1.4% for cocaine, 1.1% for ecstasy, 0.7% for methamphetamines, 0.68% for opioids, 0.36% for opiates, and 0.5% for prescriptions (el-Guebaly, 2014).

Canadian Survey data (2011) indicated that one in six (16.7%) Canadians aged 15 years and older reported use of opioid pain medication in the previous 12 months (Health Canada, 2011).

The Canadian Centre on Substance Use and Addiction estimated that in 2012 there were 75,000-125,000 persons using injection drugs and approximately 200,000 people with prescription opioid dependence (Canadian Centre on Substance Use and Addiction, 2015). The report indicated that opioid pain medication is used by 14.9% of the Canadian population and that 2% of Canadians reported abusing opioid pain medication (Canadian Centre on Substance Use and Addiction, 2015).

Fischer (2016) reported that Canadian survey data found that approximately 5-8% of general population adults and 5-20% of adolescents and young adults (secondary and post-secondary students) reported 'past year' non-medical prescription opioid use (Fischer et al., 2016). The author also found that the use of other illicit drugs (stimulants, hallucinogens, ecstasy) has remained at a low prevalence rate of 1-2% in the general adult population (Fischer et al., 2016).

DEMOGRAPHICS OF PERSONS USING ILLICIT DRUGS

"Drug use represents a complex interplay of personality, genetic, environmental, and cultural influences on behavior that are difficult to pull apart or treat as independent forces" (Scheier, 2010).

The literature identified the following characteristics among persons who use illicit drugs. Studies indicates that poly drug consumption is common and individual patterns of use range from experimental to habitual to dependent consumption (EMCDDA, 2017).

The literature finds that:

- Drug use is higher for all drugs among males, and that males have patterns of more intensive or regular patterns of use (EMCDDA, 2017).
- The risk of opioid misuse was “significantly higher among individuals who had low socioeconomic status (low education and low income), received public assistance, and worked in manual labor occupations” (Rigg & Monnat, 2014).
- Persons who use non-medical prescription drugs “more likely to be male, be young, be poly drug users, and have comorbid psychopathology” (Keyes, Cerda, Brady et al., 2014).
- Drug use rates have historically been highly correlated with educational status. College graduates have lower rates of current illicit drug use than those who had not graduated from high school or were graduates from high school only (SAMHSA, 2014).
- Adults who are dependent on alcohol report high rates of illicit drug use and non-medical use of prescription drugs, as compared with the general population (NIDA, 2011).
- More people (79%) who had tried an illicit drug stated that curiosity was a factor in first time use, followed by peer pressure 48.8%, and wanting to do something exciting 20% (Government of Australia, 2011).

In Canada, a report by Fischer (2016) identified the following characteristics based on a pan Canadian (I-Track) survey of persons who used injection drugs. Fischer found that “67.8% were male, had an average age of 37.5 years, and that 53.9% had not completed high school. Results from this survey also found that participants had diverse ethnic backgrounds with 57.8% identifying as Canadian or American and 26.3% as Aboriginal. Over one-quarter had moved from another city six month prior to the survey and more than half (60.8%) reported living in unstable housing or had no housing” (Public Health Agency of Canada, 2014).

The literature also indicates that there has been a change in the user demographic of opioid addiction. “In the 1960s, more than 80 percent of people who began using opioids initiated with heroin; whereas today, nearly 80 percent of persons who use opioids reported that their first regular opioid was a prescription pain reliever”(NIDA, January 2016). Recent U.S. data indicates that “current heroin users are more likely to be white, middle-class, and live in more suburban and rural areas; this is consistent with the population of people who report the largest increases in non-medical use of opioid pain relievers over the last decade” (NIDA, January 2016).

Many researchers have explored the etiology of recreational drug use. Common theories include: genetics, personality type, psychological problems, self-medication, gender, age, instant gratification, basic human need, curiosity, family and attachment issues, history of trauma, socioeconomic stressors, peer pressure, availability, historical factors, or sociocultural influences. There has not been agreement around any one single cause.

Children and Youth

The use of drugs among young people is concerning since “initiation of drug use early in life (e.g. before age 18) can be a risk factor for problematic use in adulthood” (Wood et al., 2014).

Data from the National Survey on Drug Use and Health (NSDUH) indicates that 4,300 adolescents (age 12 to 17 years) use drugs for the first time each day in the U.S.. As well, for approximately 25% of adolescents, the initial drug is a prescription medication taken for non-medical purposes (most often an opioid pain medication) (Moyer, 2014).

In the U.S. (2014), data indicated that among adolescents (age 12 to 17) 168,000 had a pain reliever use disorder, 27,000 had a cocaine use disorder and 18,000 had a heroin use disorder in the past year (Centre for Behavioural Health Statistics and Quality, 2015).

Canadian data (2013) showed that “1.5% of Canadian students in grades 7 to 9 and 2.5% of students in grades 10-12 reported past use of pain relievers to get high and not for medical purposes” (Canadian Centre on Substance Use and Addiction, 2015). “Among First Nations youth age 12-17 years, 1.3% reported using illicit or prescription opioids without a prescription during the previous 12 months” (Canadian Centre on Substance Use and Addiction, 2015).

Indigenous Identity

In Canada, survey data (2008-2010), indicated that approximately 5% of First Nations people aged 18 and older living on-reserve or in northern First Nations communities reported past-year use of illicit (heroin) or prescription opioid, including morphine, methadone and codeine, without a prescription (First Nations Regional Health Survey, 2012).

Urban/Rural

The literature provides information about opioid use in urban and rural areas. Some findings suggest that rural residents were more likely to seek help for abuse of non-heroin opioids (prescriptions painkillers) and stimulants, whereas urban residents appeared more prone to abuse cocaine and heroin. Urban residents seek treatment for meth addiction at the same rate as people who live outside of cities (SAMHA, 2012).

One U.S. study comprised of 47,400 respondents found that the risk of opioid misuse was “significantly higher among individuals who lived in urban areas, were younger, never married, had low socioeconomic status (low education and low income), received public assistance, and worked in manual labor occupations. The study also found that those living in rural areas and experiencing opioid misuse were more likely to have lower incomes and education, receive public assistance, be disabled or retired, work in a manual labor occupation, have poor health, and/or visit the emergency room for medical care”(Rigg & Monnat, 2014).

Additionally, these authors found that “in urban areas, prescription opioids were more often used in conjunction with other drugs than they were in rural areas” (Rigg & Monnat, 2014).

Another U.S. study citing nationally representative survey data found that although all states have demonstrated an increase in non-medical prescription opioid morbidity and mortality, death and injury from non-medical prescription opioid misuse was concentrated in states with large rural populations. This study indicates that opioid poisonings in non-metropolitan counties have increased at a rate greater than threefold the increase in metropolitan counties (Keyes et al., 2014).

A Canadian review of opioid deaths in Ontario found that 90% of persons who died of an overdose lived in urban areas (Gomes et al., 2014).

Mental Health

Many factors influence substance misuse, including historical trauma, medical and mental health problems (Filetti et al., 1998). Evidence indicates that “compared with the general population, people addicted to drugs are almost twice as likely to suffer from mood and anxiety disorders. Although drug use disorders commonly occur with other mental illnesses, this does not mean that one caused the other” (NIDA, 2011).

Prescription opioid misuse has been linked to exposure to traumatic events and post-traumatic stress disorder. A study by Mackey-Amiti reported that prescription opioid use was associated with major depressive disorder, bipolar disorder, and generalized anxiety disorder (Mackey-Amiti et al., 2015).

ROUTE OF DRUG ADMINISTRATION

Canadian researchers have reported differences in route of drug administration and key differences in the characteristics of injection and non-injection users of opioids. These differences may have implications for prevention approaches. A report by the Public Health Agency of Canada (2014) provided data about commonly injected drugs and drugs used by injection and other routes.

In Canada, commonly injected drugs were: cocaine (81.7%), diverted morphine (40.4%), oxycodone (39.0%), heroin (28.1%), and hydromorphone (26.5%). Opioid analgesics (such as non-prescribed morphine, heroin, hydromorphone, and oxycodone) were used by injection and other routes (Public Health Agency of Canada, 2014).

The literature suggests key differences in the characteristics of persons who use injection and non-injection drugs. A Canadian study (Fischer, 2006) found that persons who used injection drugs had:

- Higher risk behaviours and harm outcomes;
- Poorer housing, with a higher proportion of current injectors (18%) living on the street compared to non-injectors (5%);
- More intense patterns of drug use, higher frequency of use and higher drug expenditures; and,

- More exposure and higher involvement in treatment compared to non-injectors.

In this study the researchers found that geographic location also emerged as a predictor of injection versus non-injection. They proposed that route of drug administration was “influenced by socio-environmental factors, including drug cultures, drug markets or social services and enforcement” (Fischer, 2006). Fischer found no significant difference in average age, or recent overdose experiences.

ILLICIT DRUG OVERDOSES

The U.S. literature suggests that some of the current overdose crisis has resulted from past practices beginning in the 1990’s that led to changes in opioid prescribing, including:

- Changes in regulation, policy and practice that focused on opioid medications as the primary treatment for all types of pain (NIDA, March 2017);
- A belief that opioids prescribed for pain would not lead to addiction; (NIDA, June 2017);
- An emphasis to assess pain as “the 5th vital sign” at each clinical encounter (Lucas et al, 2007);
- Aggressive marketing by pharmaceutical companies promoting opioids as “first-line” treatments for chronic pain (NIDA, June 2017) (Van Zee, 2009); and,
- Greater social acceptability for using medications for different purposes (NIDA, June 2017).

The literature suggests that the increase in overdoses from opioids is an unintended consequence of recent efforts to address opioid over prescribing practices (NIDA, June 2017) (Canadian Drug Policy Coalition, 2014).

As well, the literature suggests that the opioid overdose epidemic has escalated, with the rise in deaths related to illicitly manufactured, synthetic opioids such as fentanyl, and “increase in the availability of counterfeit pills containing varying amounts of fentanyl and fentanyl-related compounds” (CDC, August 2016) (NIDA, June 2017).

Studies indicate that “for every fatal overdose there are approximately 25-50 non-fatal near miss events” (Darke & Farrell, 2014).

ILLICIT DRUG OVERDOSE DEATHS

International

Jurisdictions are reporting an epidemic of drug overdose poisoning deaths specifically involving opioids (Rudd et al., 2016) (B.C. Government, 2017).

In Europe, a 2017 report indicates an increase in drug overdose deaths, and that heroin was implicated in many of the deaths. Most recent overdose mortality data from Europe indicates rates of over 4 deaths per 100,000 population in eight northern European countries (EMCDDA, 2017).

In Europe, drug overdose continues to be the main cause of death among high-risk persons using drugs, and over three quarters of overdose victims are males (78%). Studies on cohorts of high-risk persons using drugs show mortality rates in the range of 1-2% per year. As well, persons who use opioids in Europe were 5-10 times more likely to die than their peers of same age and gender (EMCDDA, 2017). Stimulants such as cocaine, amphetamines, MDMA and cathinone were implicated in a smaller number of overdose deaths in Europe (EMCDDA, 2017).

In the U.S., data from 2013 to 2014 shows statistically significant increases in drug overdose deaths for both males and females, persons aged 25-34 years, 35-44 years, 55-64 years and >65 years (Rudd, et al., 2016).

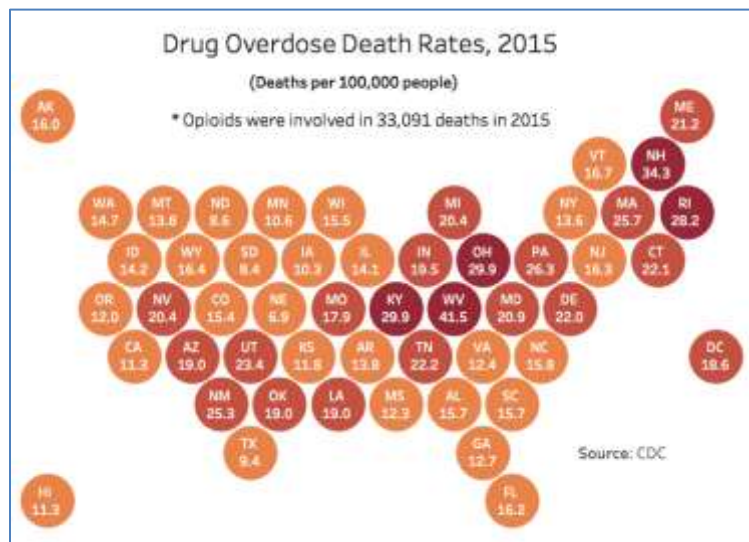
U.S. data (2013) found that there were 16,235 overdose deaths related to opioid analgesics, a rate of 5.1 per 100,000 (Chen, Hedegaard, & Warner, 2015). In 2014, the U.S. rate of opioid overdose deaths rose to 9.0 per 100,000 population (Rudd et al., 2016). This represents a 200% increase in the rate of overdose deaths involving opioids (opioid pain relievers and heroin) since 2000” (Rudd et al., 2016).

The scope of drug overdose deaths is highlighted by the fact that in 2014, drug overdose deaths were the leading cause of accidental death in the United States, surpassing automobile crash deaths (Rudd et al., 2016).

People dependent on opioids are the group most likely to suffer an overdose. The incidence of fatal opioid overdose among opioid-dependent individuals is estimated at 0.65% per year (WHO, 2014).

Risk factors for overdoses with prescribed opioids include a history of substance use disorders, high prescribed dosage (over 100mg of morphine or equivalent daily), male gender, older age, multiple prescriptions including benzodiazepines, mental health conditions and lower socioeconomic status (WHO, 2014). Combining opioids with alcohol and sedative medication increases the risk of respiratory depression and death, and combinations of opioids, alcohol and sedatives are often present in fatal drug overdoses (WHO, 2014).

Figure 1:



Literature indicates that an increase in the availability of illicitly manufactured synthetic opioids appears to be driving a significant increase in overdose deaths” (Davis, Green, & Beletsky, 2017) (Rudd et al., 2016).

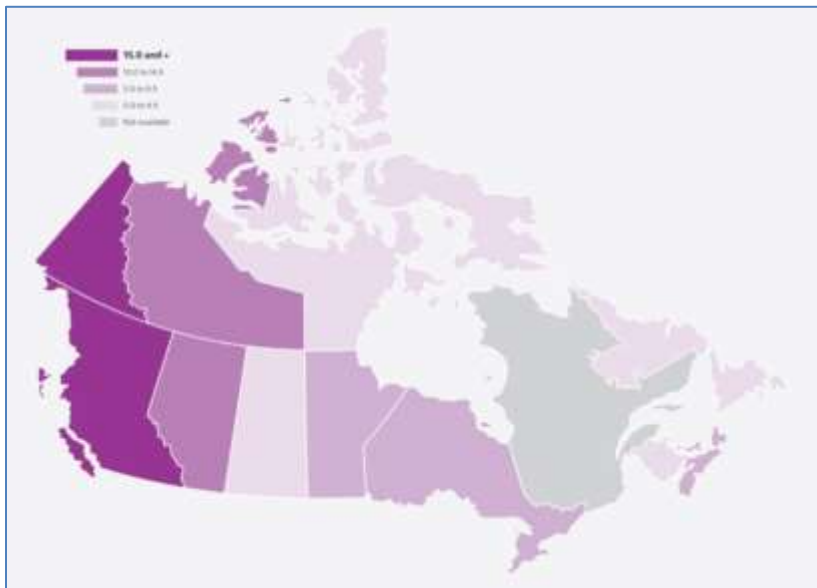
Canada

This review was unable to find national-level data about all illicit overdose deaths. However, opioid-related mortality data was available for 2016 for some Canadian provinces and territories (see Figure 2).

In 2016, Health Canada preliminary data indicated that 2,458 apparent **opioid-related deaths** occurred in Canada. This is a rate of 8.8 opioid-related deaths per 100,000 population. Western Canada has the highest rates of opioid-related deaths, of over 10.0 per 100,000 population (Government of Canada, 2016).

Health Canada cautions that the 2016 data is subject to change. In April 2017, a Special Advisory Committee agreed upon a national definition of apparent opioid-related deaths. This definition has yet to be applied by provinces and territories (Government of Canada, 2016).

Figure 2: Opioid-related deaths per 100,000 population for 2016:

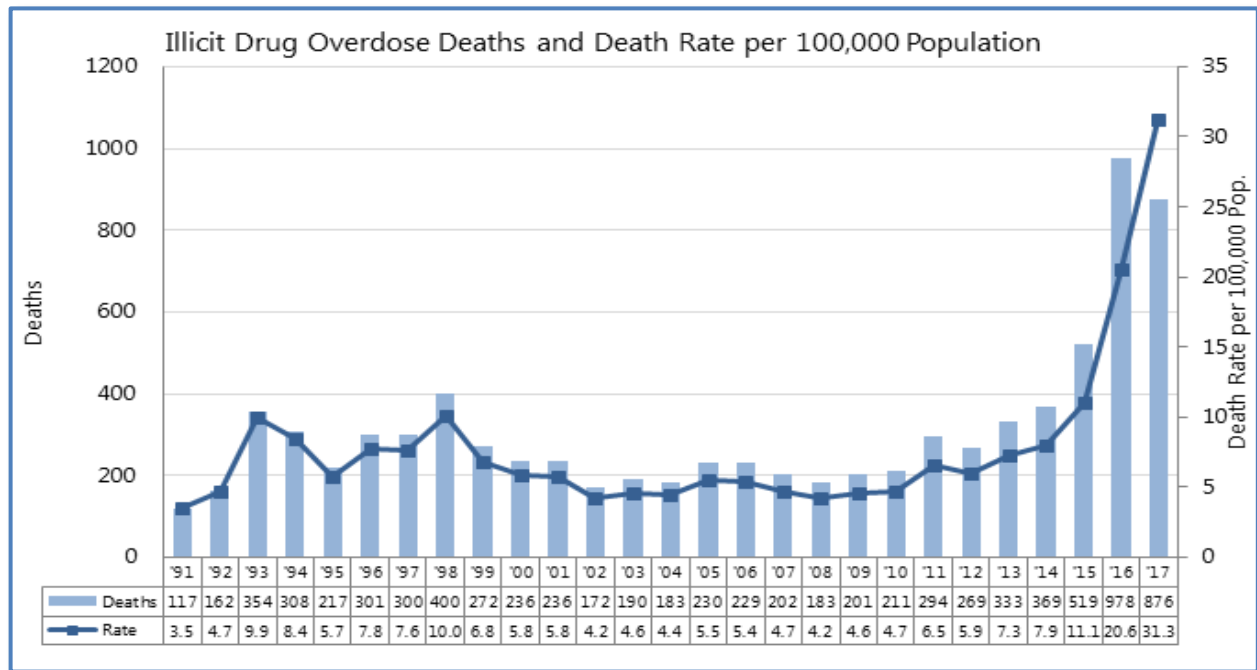


Source: Government of Canada, 2016

British Columbia (B.C.)

B.C. had seen a significant increase in illicit drug overdose deaths. B.C. Coroners Service data indicates that illicit overdose deaths increased from 7.9 per 100,000 population in 2014 to 20.6 per 100,000 population in 2016. This upward trend continues with B.C. data for July 2017 finding the overdose death rate as 31.3 per 100,000 population (see Figure 3) (B.C. Coroners Service, September 2017).

Figure 3: January 1, 2007 to July 31, 2017



OVERDOSE DEATHS - RISK FACTORS

The literature identifies specific populations at risk for overdose. Hawk indicates that “individuals at particularly elevated risk for fatal overdose include those prescribed more than 100 mg per day of oral morphine equivalents with a personal history of overdose; those recently released from a controlled environment such as jail and inpatient substance abuse treatments; and those who mix opioid use with alcohol, benzodiazepines, or other drugs” (Hawk et al., 2015).

“Persons released from correctional facilities are at high risk of fatal drug overdose in the first few weeks of release from incarceration” (Hawk et al, 2015). The increase in mortality among released prisoners who were former users of opiate drugs has been attributed to loss of tolerance and erroneous judgment of dose when they returned to opiate use (Strang, Best, & Rees, 2003). A study by Kinner (2012) found that among those recently released from prison, the risk factors for non-fatal overdose included: daily use of heroin, benzodiazepines, cocaine or methamphetamine, public injecting and previous non-fatal overdose (Kinner et al., 2012).

Literature indicates that although men are more likely to experience overdose, overdose deaths due to prescription opioids are increasing at a great rate among women (Canadian Drug Policy Coalition, 2014).

The risk of opioid overdose death is greater for persons who use drugs alone. Survey findings indicate that over half (52.4%) of injection drug use occurred in the participant’s apartment or house; while one-quarter of participants who injected drugs did so in public places (23.3%) (Public Health Agency of Canada, 2014).

There were limited studies that compared differences in overdose deaths among persons who experienced chronic illicit drug use compared to regular use compared to occasion use or first time use of illicit drugs.

PREVENTION, TREATMENT AND HARM REDUCTION

“Reducing the risk for fatal overdose rests on a combination of prevention, treatment, and harm reduction initiatives” (Hawk et al., 2015).

1) Primary Prevention

Primary prevention focuses on reducing the number of new users and increasing engagement of current users (Hawk et al., 2015). Efforts to decrease non-medical opioid use have included establishing and optimizing prescription monitoring programs, closing down “pill mills,” and increasing access to pain experts (Hawk et al., 2015).

Addressing Prescribing Practices

Prescription opioids are one of several approaches to address chronic pain. However their use can also result in addiction or overdose deaths (Canadian Centre on Substance Use and Addiction, 2015). The literature indicates that “the use of opioids for long-term management of chronic non-cancer pain lacks evidence of benefits, and may lead to poor results and negative side effects. The risk of adverse outcomes, including death, increase with co-prescribing especially with opioid/benzodiazepine combinations” (Oregon Health Authority, 2015).

Research suggests that “if opioids are used, clinicians should prescribe the lowest effective dosages, monitor the patient closely to reduce the risk of adverse events and overdose, and consider alternative treatments if there is no meaningful improvement in the patients’ pain and function” (BMJ, 2016) (Busse, Craigie, Juurlink, Buckley, Wang, Couban, & Agoritsas, 2017).

In addition to changes in opioid prescribing practices prescription monitoring program (PMP) were identified as an important component to address medically prescribed opioid misuse. PMPs may “enhance patient care and assist in the safe use of controlled prescription drugs by monitoring outpatient prescription dispensing information, reduce the harms resulting from the use of controlled prescription drugs, and assist in reducing the diversion of controlled prescription drugs (Canadian Centre on Substance Use and Addiction, 2015).

Data from a U.S. national health survey found that the majority (75%) of past year occasional non-medical users of opioids (< 2.5 days per month) reported obtaining the drug for free from a friend or relative (Hawk et al., 2015). Whereas one quarter (25%) of those who had heavy use (>16 days per month) more likely to receive prescriptions from multiple health care providers, and more likely to buy opioids from friends, family members, and drug dealers” (Hawk et al., 2015).

There is evidence that PMPs changes prescriber behavior (Hawk et al., 2015). However, findings from a review by the Canadian Centre on Substance Use and Addiction (2015) indicate that more work is needed to evaluate the effectiveness of PMPs and ensure that best practices are implemented (Canadian Centre on Substance Use and Addiction, 2015).

Awareness and Education

Educational interventions that target high-risk individuals at risk for fatal overdose, such as teens and those with a history of substance abuse disorders are reported in the literature as strategies to reduce fatal overdose. Evidence about the impact of this approach is limited (Hawk et al., 2015).

Other promising practices are a program called ‘Communities That Care’ and Strengthening Families Program (SFP 10-14). Communities that Care program’s premise is that the prevalence of health and behavioural problems among youth can be reduced by identify risk and protective factors, and selecting effective early intervention programmes that address these (EMCDDA, 2017).

The Strengthening Families Program for Youth 10-14 (SFP10-14) reduced substance use among the friends of teens who participated in the intervention, as well as the participants themselves. Previous studies have demonstrated that the program reduces participating children's substance use and improves participating parents' parenting practices (NIDA, January 2017).

Medication return programs

The literature also indicated that identifying the source of non-medical opioid use can help guide effective interventions, such as educational campaigns against sharing medications and promoting medication “take back” events (Hawk et al., 2015). Medication ‘take back’ is when unused prescription drugs are returned to a pharmacy or collected at a specified drop off area for appropriate disposal.

Unused pain medications are a source of access to drugs taken for non-medical purposes. As mentioned earlier, for adolescents, the initial drug is a prescription medication taken for non-medical purposes (most often an opioid pain medication) (Moyer, 2014).

“While the success in collecting medications can be documented, the actual impact on substance abuse and overdose rates is unknown” (Hawk et al., 2015).

2) Treatment

Opioid dependence is a chronic, relapsing condition that requires long-term treatment (CADTH, 2012). The literature indicates that chronic exposure to addictive drugs alters the brain in ways that make quitting difficult. “Drugs can alter the way people think, feel, and behave by disrupting neurotransmission, the process of communication between neurons (nerve cells) in the brain. Many scientific studies have established that drug dependence and addiction are

features of an organic brain disorder caused by drugs' cumulative impacts on neurotransmission" (NIDA, 2017).

Opioid Agonist Therapy (OAT) (buprenorphine-naloxone (Suboxone), Methadone, Buprenorphine)

Medically prescribed opioids (e.g. methadone or buprenorphine-naloxone) are used to treat opioid addiction, under the supervision of a trained health care provider (Canadian Centre on Substance Use and Addiction, 2015).

"International guidelines recommend opioid substitution treatment, such as methadone and buprenorphine, as a first-line treatment for opioid dependence" (Saulle et al., 2016).

In 2007, Suboxone (buprenorphine/naloxone) was approved by Health Canada for substitution treatment in opioid drug dependence in adults. Suboxone is recommended for patients where methadone is contraindicated (CADTH, 2013).

OAT replaces illicit or off-label opioid use with opioids that are longer acting but induce less euphoria. OAT treatment eliminates withdrawal symptoms and cravings, and blocks the euphoric effects of other opioids (Nosyk et al., 2013). Literature indicates that OAT delivered with counseling and behavioural therapies is an evidence-based practice for treating opioid use disorder (SAMHSA).

A systematic review of OAT for opioid dependence using methadone or buprenorphine found reductions in illicit opioid use, injecting drug use and sharing of injecting equipment. It was also associated with reductions in the proportion of users of injected drugs who report multiple sex partners or exchanges of sex for drugs or money (WHO, 2013).

As well, studies indicate that methadone and buprenorphine-naloxone are substantially more effective than abstinence-based treatment (Srivastava et al., 2017). Studies show that medication-assisted treatment has demonstrated improved outcomes, including reduced frequency of opioid use, HIV transmission, criminal activity, and mortality" (Hawk, 2015).

Studies also indicate that methadone costs less and is more effective in retaining clients in treatment, while buprenorphine has a lower risk of abuse, including being diverted for non-prescription use (Nosyk et al., 2013) (Srivastava et al., 2017).

The literature suggests that low rates of adoption of OAT in primary care may include a lack of understanding about OAT medications, staff perceptions about the use or cost, lack of coordination with mental health providers for treatment, detoxification and stabilization of patients or lack of coordination with mental health providers for cognitive therapies as well as a lack of trained providers to oversee the treatment (Oregon Health Authority, 2015).

Evidence suggests that those who remain on OAT for at least 12 months have greater likelihood of remaining opioid-free after ceasing treatment. Chances are greater for successfully tapering

off OAT for persons with a brief history of opioid addiction (less than two years), are socially stable, and do not have severe, untreated psychiatric illness (Women's College Hospital, 2015).

Supervised Injectable Opioid Treatment (IOT) or heroin-assisted treatment (HAT)

Evidence indicates that although methadone is the standard for opioid-substitution treatment approximately 15 to 25% of the most adversely affected persons do not have a good response (Oviedo-Joekes et al., 2009). European studies have suggested that injectable diacetylmorphine, the active ingredient in heroin, can be an effective adjunctive treatment for chronic, relapsing opioid dependence (Oviedo-Joekes et al., 2009).

A paper by Byford et al, (2013) also suggests that “about 5-10% of people addicted to heroin who remain in treatment fail to benefit and continue to inject heroin on a regular basis. For this chronic group who persistently fail to benefit from conventional treatments, evidence is emerging to support the effectiveness of maintenance treatment with supervised medicinal heroin (diamorphine) as a second-line treatment for chronic heroin addiction” (Byford et al., 2013).

Studies have indicated that there is increased retention in IOT/HAT compared with control groups; reductions in self-reported illicit heroin use, and improved outcomes in quality of life or health outcome measures” (Lingford-Hughes et al., 2012). “Highly supervised injectable diamorphine maintenance treatment should be considered for patients who have failed to respond to optimised methadone maintenance treatment or buprenorphine maintenance treatment” (Lingford-Hughes et al., 2012).

Detoxification

Detoxification is the process where the effects of opioid drugs are eliminated in a safe and effective manner, so that withdrawal symptoms are minimized. Research suggests that this process is not always a safe method of treatment for individuals struggling with opioid use as it can reduce an individual's tolerance to an opiate and increase the risk of an overdose with relapse.

Medical detoxification may occur in hospital or treatment settings or in outpatient settings.

The WHO indicates that people with opioid dependence have increased risk of opioid overdose following reduced tolerance (following detoxification, release from incarceration, or cessation of treatment) (WHO 2014).

Withdrawal Management – Facility or Residential Based

A short-term service (up to seven days) that provides clinical support to individuals withdrawing from substances. Withdrawal management takes place in different settings, including community, hospital (required for alcohol and barbiturates) and home (with clinical team support). Withdrawal management alone is not a recommended treatment for opioid use as it can reduce an individual's tolerance and increase the risk of an overdose with relapse. If used,

withdrawal management should be accompanied by ongoing addiction treatment, such as outpatient treatment services, residential treatment, and/or opioid agonist therapy.

Substance-Use Sobering and Assessment Beds

A short-term (less than 24 hours), safe place for people under the influence of substances. When possible, individuals are connected to other health-care services, such as opioid substitution therapy, withdrawal management, group therapy and one-on-one outpatient counselling.

A review by Lingford-Hughes found that pharmacological management of withdrawal should be supported by psychosocial treatment (Lingford-Hughes et al., 2012).

Opioid Antagonists (i.e. blockers)

Studies suggest that effective options for managing substance use disorders include several pharmacotherapy agents (methadone, buprenorphine, and naltrexone) and psychosocial interventions. This has resulted in the development of opioid blockers; medications to prevent people who have been addicted to certain drugs from taking them again. These are sometimes used as part of a treatment program for drug abuse.

For example, naltrexone is an opioid antagonist. It acts by blocking the brain's opioid receptors, and blocks the euphoria a user would normally feel and /or causes withdrawal if recent opioid use has occurred (SAMHSA, 2014).

Vivitrol is another example of an opioid antagonist. It is a non-addictive, injectable, once-monthly medication that, when combined with counseling, helps prevent relapse to opioid dependence, after detox.

A Cochrane review of the medical literature found that oral naltrexone, with or without psychotherapy, was no better than placebo or no pharmacological treatments with regard to retention in treatment, use of the primary substance of abuse or side effects (Cochrane 2011).

Similarly, there are no studies comparing Vivitrol with its less expensive OAT therapies. One study showed that Vivitrol was better than placebo at treating opioid dependence. Other studies have shown high dropout rates, or found that participants returned to opioid use while taking Vivitrol or after going off it (*Drug Policy Alliance*, 2015).

Treatment, Counselling and Support

The literature indicates that for opioid treatment “maintenance therapy should be provided in conjunction with psychosocial intervention, such as regular counselling” (CADTH, 2012).

“People who have substance misuse problems but no mental illness may be treated via a variety of psychosocial interventions. These include motivational interviewing (MI) that looks at people’s motivation for change; cognitive behavioural therapy, which helps people adapt their

behaviour by improving coping strategies; a supportive approach similar to that pioneered by Alcoholics Anonymous; family psycho-education observing the signs and effects of substance misuse; and group or individual skills training” (Cochrane, 2011).

A 2011 Cochrane review found that people who have received MI had reduced their use of substances more than people who have not received any treatment. However, the review found that other active treatments and being assessed and receiving feedback were as effective as motivational interviewing. There was not enough data to conclude about the effects of MI on retention in treatment, readiness to change, or repeat convictions (Cochrane, 2011).

The literature also indicates that “although medications have proven effective in treating some substance use disorders, for other substances disorders (e.g. methamphetamines) there are currently no medications available to counteract the specific effects of methamphetamine or that prolong abstinence from and reduce the abuse of methamphetamine by an individual addicted to the drug” (NIDA, 2013).

The most effective treatments for methamphetamine addiction at this point are behavioral therapies, such as cognitive-behavioral and contingency-management interventions (NIDA, 2013).

Literature suggests that residential treatment may be helpful for emerging adults with opioid dependence. Randomized trials are needed to compare more directly the relative benefits of outpatient agonist-based treatment to abstinence-based, residential care in this vulnerable age-group, and to examine the feasibility of an integrated model (Schuman-Olivier, Greene, Bergman, & Kelly, 2014).

Hospitalization (compulsory treatment and secure mental health beds)

The UN system has recommended nine essential services for people who inject drugs, all of which have a strong evidence base and none of which sanction compulsory treatment. Compulsory drug rehabilitation centres have not shown to be effective in preventing relapse and they pose considerable risks to the well-being of detainee (WHO, 2013).

Many countries provide long-term residential treatment for drug dependence without the consent of the patient that is in reality a type of low security imprisonment. Evidence of the therapeutic effect of this approach is lacking, compared to traditional imprisonment and community based involuntary drug treatment. It is expensive, not cost-effective, and neither benefits the individual nor the community” (WHO, 2013).

Community Outreach Teams

Evidence indicates that integrated community treatment reduces hospitalization, increases housing stability, and improves quality of life for individuals with severe mental illnesses. This model of integrated, community based treatment, support and rehabilitation has been adapted to a variety of settings, circumstances and populations (SAMHSA, 2008).

3) Harm reduction strategies

“Harm reduction is an evidence-based approach to keep people safe by minimizing death, disease, injury and other adverse outcomes associated with high risk behaviour” (BCCDC, 2014).

There are multiple opportunities for harm reduction strategies to minimize the morbidity and mortality associated with opioid abuse and dependence, including targeted overdose education, naloxone distribution, and policies to increase bystander assistance in the case of an overdose (Hawk et al., 2015).

Naloxone

Naloxone is an opioid antagonist medication that reverses the effects of an opioid drug (e.g., heroin, morphine, fentanyl or oxycodone). Naloxone is administered to reverse life-threatening respiratory depression and restore breathing. Naloxone rapidly reverses the effect of opioids, including analgesia and respiratory depression, and lasts 20 to 90 minutes, allowing individuals to access medical care. Naloxone administration by intranasal and intra-muscular administration has been shown to be safe and effective with minimal training (Hawk et al., 2015).

A recent systematic review of the effectiveness of take-home naloxone found evidence that its provision in combination with educational and training interventions reduces overdose-related mortality (EMCDDA, 2017).

“Some prescription opioids have a longer duration of effect than naloxone and their ingestion increases the risk that respiratory depression may recur and additional naloxone may be required. This is one reason that immediate transport to the emergency department is advised if naloxone is administered outside of the hospital” (Hawk et al., 2015).

An evaluation of a national naloxone programme in the United Kingdom found that there was a statistically significant reduction in the proportion of opioid-related deaths that occurred within a month of prison release (EMCDDA, 2017).

Literature indicates that schools are not a high-risk environment for overdoses. “Schools are encouraged to purchase naloxone if students are engaged in opioid use, or if there is drug use on or near school grounds” (BCCDC, 2017). In B.C., non-prescription naloxone is available through pharmacies. Training was developed for B.C. pharmacists so they can teach purchasers about how to use it in an overdose situation.

Good Samaritan laws are an important part of preventing fatal overdoses. It has been well documented that bystanders often refrain from calling 9-1-1 or seeking medical assistance due to fear of police involvement and criminal liability (Hawk et al., 2015).

Supervised injection facility (SIF)

Supervised injection facilities also called drug consumption rooms, are spaces where persons who use injection drug inject pre-obtained illicit drugs under the supervision of health-care staff.

“Supervised drug consumption facilities aim to both prevent overdoses from occurring and to ensure professional support is available if and overdose happens. Connect high-risk users of drugs with addiction treatment and other health and social services. They also seek to contribute to a reduction in drug use in public places and the presence of discarded needles and other related issues with open drug use. They seek to attract hard –to-reach population of users, especially marginalized groups and those who use on the streets or other unhygienic conditions. Evidence has shown that the use of supervised injection facilities is associated with self-reported reductions in injecting risk behaviour” (EMCDDA, 2017).

Studies indicate that SIF have been associated to reductions in overdose mortality, syringe sharing, unsafe injection practices, public injection drug use and public syringe disposal (Bouvier et al., 2017).

Systematic reviews have demonstrated that SIFs do not increase injection drug use, drug trafficking or crime in surrounding areas (Bouvier et al., 2017).

Drug Checking

Drug checking is a harm reduction approach which allows people who use substances to confirm the contents of a street drug, and receive drug information or counselling about using an illicit substance. Drug checking may be done through a range of technologies. These include the use of colorimetric reagent testing strips (chemical liquids which allow fast, real-time results indicating the presence of a drug by changing color in the presence of the drug) to mobile or off-site laboratory analysis using chromatography (which separates different chemical compounds and comparing the results against known substances).

In Canada, drug checking requires an “exemption under the *Controlled Drugs and Substances Act* to allow service staff to offer clients the means of drug checking without handling the samples themselves” (B.C. Centre on Substance Use, 2017).

There is international and Canadian evidence on the use of drug testing in party settings. Australian research found that for ecstasy users 70% of ecstasy pills are taken at clubs, festivals and dance parties. Drug-testing kits or booths at venues where pills are known to be consumed could inform users about the content of illicit drugs (Ritter, 2017).

There is literature that suggests that drug testing may lead to the appearance of safety, and may increase risks for some, and that not everyone will use the service (Ritter, 2017).

- On-site drug testing should be combined with other harm reduction activities including information about overdose prevention and safer-use messages, addiction support and counselling programs.
- Cooperation with local authorities especially police is essential.

The literature describes the risks and benefits of drug testing:

Potential Benefit	Potential Harm
Research from Austria shows 50% of those who had their drugs tested said the results affected their consumption choices. Two-thirds said they wouldn't consume the drug and would warn friends in cases of negative results.	May lead to the appearance of safety. Testing kits may not identify all ingredients or qualify the amount.
Testing booths offer an important opportunity to enter into contact with hard-to-reach populations and to raise their interest in preventive and harm reduction messages.	There is still no strict scientific proof for the protective impact of on-site drug testing interventions.
Drug testing provides long-term data about the actual substances present in the drug scene and consumption trends. And it creates the potential for an early warning system beyond immediate users.	Some individuals may ignore the results. Some individuals may not use the service.

(National Drug and Alcohol Research Centre, 2017) (Burkhart et. al, 2001)

Regulation

Research suggest that the most effective way of minimising drug harms is through appropriate regulation, based upon normative, legal frameworks, rather than prohibition (Rolles, 2009). The evidence indicates that there is no relationship between the punitive of a country's drug laws and its rate of drug use. Instead, drug use tends to rise and fall in line with broader cultural, social or economic trends (Murkin, 2014).

One blueprint for drug regulation identified five possible models for drug management (Rolles, 2009):

1. Prescription: equivalent to current prescription models for medical drugs and some opiate maintenance programs.
2. Pharmacy sales: drugs made available through pharmacies or pharmacy-like outlets, either on prescription or over-the-counter
3. Licensed sales: vendors granted licences to sell specific drugs under clearly defined conditions.

4. Licensed premises: vendors licensed to manage premises where drugs would be sold and consumed, similar to public houses or bars
5. Unlicensed sales: certain low risk substances could be managed through food and beverage legislation (e.g. similar to coffee houses).

“In a legalized drug framework, control is taken by local, regional and international bodies that are subject to public scrutiny from civil society, professionals and policy makers and where the key concern is public health” (Rolles, 2009).

The literature identifies Portugal as an example of a successful shift to drug legislation. Portugal decriminalized the possession of all drugs for personal use in 2001. However, the policy of decriminalization was complemented by allocating greater resources across the drug field, expanding and improving prevention, treatment, harm reduction and social reintegration programs, and included establishing a guaranteed minimal income (Murkin, 2014).

One review suggested that Portugal’s positive outcomes of decriminalization may not have been achieved without the broader health and social reforms (Murkin, 2014).

In Portugal, key findings include (Murkin, 2014):

- Drug use is below the European average
- Drug use has declined among those age 15-24 years
- Rates of past year and past month drug use among the general population have decreased.
- Rates of continuation of drug use have decreased.

The literature also suggests that legally protected cannabis dispensaries (LMDs) were associated with lower rates of dependence on prescription opioids, and deaths due to opioid overdose, than would have been expected based on prior trends. However, the literature also indicates that LMDs were associated with higher rates of recreational cannabis use and increased potency of illegal cannabis (NIDA, May 2016).

In 2007, the Government of Canada implemented a National Anti-Drug Strategy, led by Justice Canada. The Strategy focused on three priority areas: combating illicit drug production and distribution operations; preventing illicit drug use and decreasing the impacts of drug use; and, treating and rehabilitating those with illicit drug dependencies (Government of Canada, 2016).

It includes:

- Expand efforts to help locate, investigate and shut down organizations involved in the production and distribution of illicit drugs;
- Provision of legal advice to law enforcement at the investigative stage and to effectively prosecute those involved with the production and distribution of illicit drugs;
- Ensure accurate and timely analysis of suspected illicit drugs seized by law enforcement;
- Inhibit the cross-border movement of precursor chemicals and illicit drugs;
- Stop the flow of money that organized crime makes from the illicit drug trade;

- Conduct joint investigations with United States counterparts; and
- Ensures that serious penalties are in place for serious drug crimes.

MONITORING AND SURVEILLANCE

The literature supports active monitoring and surveillance of illicit drug use, treatment and interventions through surveys, data collection and rigorous study. There is a need for improved data collection, data standards and definitions and data sharing between partnering agencies. There is a need to disseminate timely information about harms related to substance use including overdose, adverse reactions to contaminated products, and other emerging issues.

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