



5 **IHE Quality, Research, and Public Health
(QRPH)
White Paper**

10 **Opioid Epidemic: Integrating Electronic Medical
Records and Prescription Drug Monitoring
Programs to Limit Abuse of Controlled
Substances**

15 **Revision 1.0 – Draft for Public Comment**

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Foreword

This is a white paper of the IHE Quality, Research and Public Health (QRPH) domain.

- 30 This white paper is published on September 23, 2019 for Public Comment. Comments are invited and can be submitted at https://www.ihe.net/QRPH_Public_Comments. In order to be considered in development of the subsequent version of the white paper, comments must be received by October 23, 2019.
- 35 General information about IHE can be found at www.ihe.net.
Information about the IHE Quality, Research and Public Health domain can be found at ihe.net/IHE_Domains.
Information about the organization of IHE Technical Frameworks and Supplements and the process used to create them can be found at http://ihe.net/IHE_Process and <http://ihe.net/Profiles>.
- 40 The current version of the IHE Quality, Research and Public Health Technical Framework can be found at http://ihe.net/Technical_Frameworks.

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1 Introduction

65 This document describes the current status of the opioid epidemic. It contains an analysis of the different approaches that are used to combat the opioid abuse and drug seeking, using Prescription Drug Monitoring Program (PDMP) data from Electronic Medical Records (EMRs).

1.1 Purpose of the White Paper

70 This white paper is intended to analyze the severity of the opioid crisis on an international level. The document investigates death rates, abuse of prescribed prescription drugs, illicit drug abuse, and potential causes of opioid addiction. The differences in public health policy are compared and contrasted to discuss solutions that are used in different countries, jurisdictions, and territories.

75 This document will inform the reader of the severity of opioid drug abuse and the current ways policies and systems that are used across the world are employed to combat this issue.

1.2 Intended Audience

80 This white paper is for a general understanding of international EMR policies and their application in relation to preventing medical opioid abuse. The intended audience includes public health organization staff, healthcare policy makers, and implementers. The content assumes a novice audience for this subject.

85 Unless otherwise stated, the term “provider” refers to the individuals (e.g., doctors and nurses) and the institutions (e.g., hospitals and emergency rooms) responsible for providing clinical healthcare services. “Implementers” apply health information technology (IT) and clinical quality measures. While an implementer may also be a provider, the term implementer refers to this more technical role.

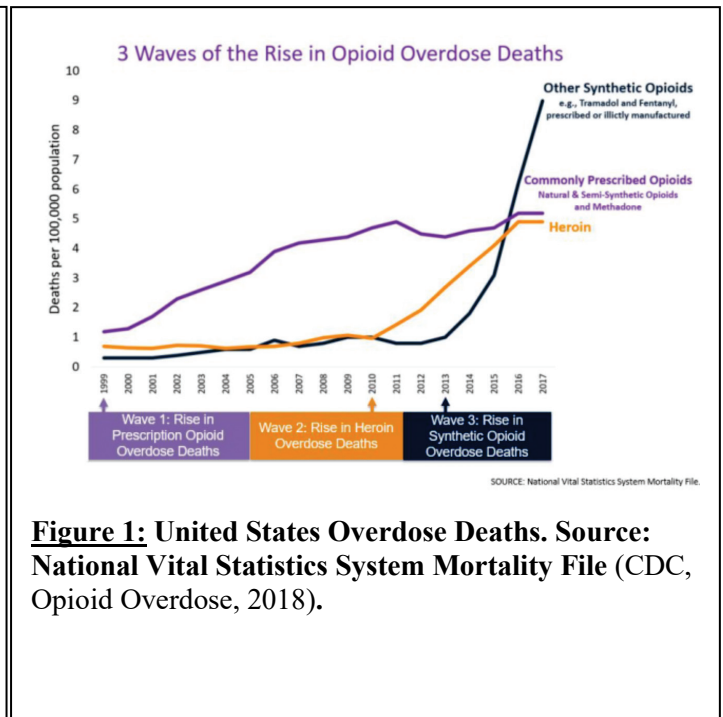
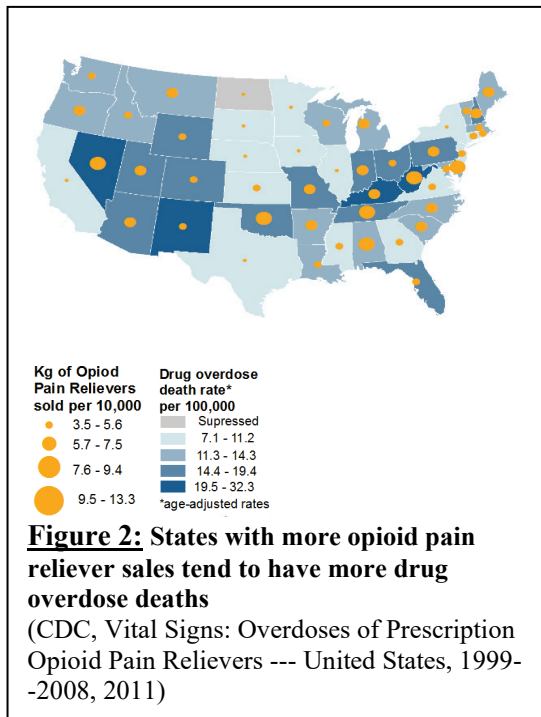
1.3 Open and Closed Issues

None

2 The Problem

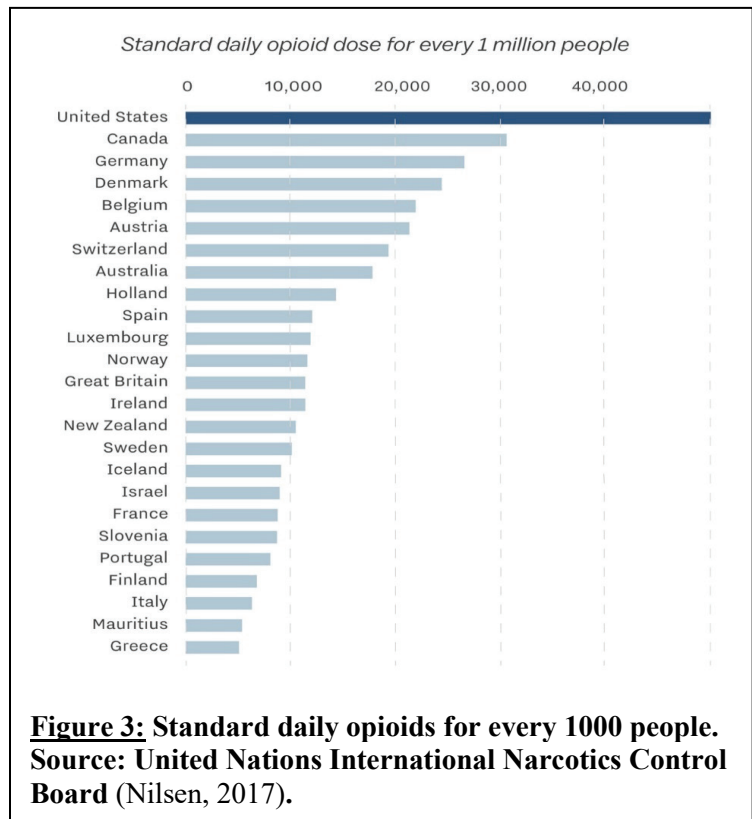
90 Opioids have been used for cancer treatments, dental procedures, and chronic pain management. Outside of their increased pharmaceutical use, non-prescribed opioids and opiate use has also been an underlying problem within the substance abuse and addiction communities. Since 1999, there has been a drastic increase of opioid abuse that has become a problem within many countries. Most of the opioid abuse is related to illicit use of pharmaceutical opioids such as fentanyl and tramadol. The abuse of prescription opioids, including fentanyl and its analogues, 95 has the highest impact on the United States and Canada (Crime, 2018). It has become such a problem that it has lowered the average life expectancy in the United States and British Columbia (PHAC, 2018). Opioid abuse has reached epidemic levels in these countries and has continued to increase.

100 Outside of these countries, the impact of fentanyl and its analogues is low in comparison (Crime, 2018). While not as severe as in the United States and Canada, there is still major opioid abuse present in Europe and Asia, especially in Eastern and South-Eastern Europe. In 2015, overdose deaths in the European Union were the highest they have ever been in the past three years (Crime, 2018). Tramadol is more popularly misused in Africa and the Middle East (Crime, 2018). The WHO World Drug Report scarcely mentions developing countries in their review of 105 substance abuse in the world. While the overdose rates across the world fluctuate, there is still evidence of opioid abuse in many countries. Underreporting also needs to be taken into consideration for all countries since many of the statistics gathered by the World Drug Report are based on death rates and information gathered from opioid abuse recovery programs.

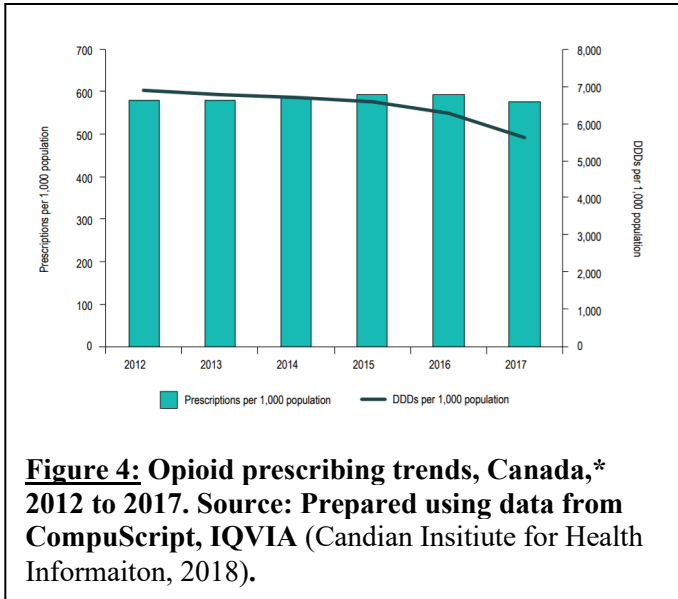


110 Many of the deaths in the United States are associated with synthetic opioids; overdoses from
prescribed opiates and heroin have increased since 1999 and have continued to rise every year. In
2016, during the period of the drastic increase of synthetic opioid use, their overdose rate seems
to have regulated while the number of overdoses for synthetic opioids have skyrocketed (**Figure
1**). In the United States, 11.4 million (23%) people end up abusing opioids that are prescribed to
them (Services, 2018). The abuse and addiction to these prescription opiates can be linked to the
115 overprescribing of those medications. The prescribing habits in the United States has gotten to
the point that some states such as Alabama and Arkansas, are prescribing more than 100 opioid
prescriptions per 100 people (CDC, Opioid Overdose, 2017). When the prescription rates are
analyzed in correlation to the opioid related death rates, there seems to be a connection. States in
120 the United States with more opioid pain reliever sales tend to have more drug overdose deaths
(**Figure 2**). The data seems consistent with the conclusion that this connection exists. (CDC,
Opioid Overdose, 2018). The combination of the abuse resulting from over prescribing of the
opioid medications and the abuse of illicit drugs needs to be taken into consideration. This
dynamic in the United States is similar to what is happening in the European Union, but on a
much larger scale.

125 The use of heroin injection in the European Union has been steadily decreasing to the point
where it has been at its lowest in 2017. However, there is still an increase in the number of
overdose deaths and 81% of those deaths are attributed to opioids (EMCDDA, 2018). When
comparing the prescribing rates of
130 several countries, there is a drastic
difference between them (**Figure 3**).
The European Union countries are
prescribing less opioids per 1000
people than both the United States
and Canada. The prescribing process
135 and policies in the European Union
are very different from the
prescribing process in the United
States. This is mainly due to the fact
that opioids can only be prescribed
140 by specialists in most European
Union countries (Nilsen, 2017). This
creates a system that makes it harder
to doctor shop and therefore helps
when it comes to adhering to
145 prescribing practices. There is still
abuse of prescription opioids and
illicit sales and use of opioids that
contribute to the opioid deaths in the
European Union (EMCDDA, 2018),



150



just on a much smaller scale compared to the United States and Canada.

When looking into Canada, the major cause of the death rates come from illicit drug use, specifically fentanyl (PHAC, 2018). Fentanyl has become more dangerous in Canada because it is starting to be cut into other illicit drugs such as cocaine (BEBINGER, 2018). This has caused a devastating outbreak of fentanyl related overdoses in people that do not otherwise use opioids. It is impossible to distinguish the difference between illicit fentanyl and prescription fentanyl during autopsy (PHAC, 2018). There is still a portion of overprescribing that does take place, but it is less prevalent than in the European Union and the United States

(Crime, 2018). The prescription rates and daily doses in Canada have started to decrease over the past few years (Figure 4) and this information with the increase in deaths support the fact that the main problem in Canada stems from illicit opioid use and production than from overprescribing.

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3 Prospective and Retrospective Prevention

3.1 Prospective Prevention

180 Prospective prevention is a blanket term for approaches in healthcare that is intended to prevent a
healthcare issue before it becomes a problem for an individual. Prospective prevention for opioid
abuse can take many shapes. Many countries have prospective prevention programs and laws set
in place to control the flow of opioid medications to public consumption. In Brazil, for example,
there is only one place that can dispense opioids, but there is some discussion that there is a rise
185 in their crisis which is expanding across South America with the illicit drug use outside of over
prescribing (Recovery, 2019). However, prospective prevention can also be a result of the
healthcare system of a country. There are countries in Europe that utilize “gate keeping” which
means that whenever a patient needs to see a specialist, they are referred out through their
primary care physician (Willems, 2001). This creates a system where the primary care physician
is aware of what medications the patient is being prescribed and can more easily see if their
190 patient is being over prescribed opioids. While these are very useful approaches, the policies of
the country affect the digital health care informatics and technology development. Digital health
development will improve the technology and standards that can greatly increase the accuracy of
these prospective approaches.

3.2 Retrospective Prevention

195 Retrospective prevention for opioid abuse is also very popular and takes the shape of substance
abuse recovering programs, safe injection site centers, and therapy. Safe injection sites help
prevent the spread of blood borne illnesses that come with reusing needles such as HIV, and
hepatitis B and C. They can also prevent overdose and are sometimes the first step in helping
people down the road to recovery. While a safe injection site program’s main purpose is to
200 monitor the patients for overdose, it can also be a resource to connect people to treatment sources
(Weiner, 2017). Australia’s safe injection sites have proven to reduce mortality and morbidity
associated with illegal opiate use.

Australia has taken the initiative of having over the counter Narcan available in all pharmacies
without the need for a prescription. The country no longer recommends the use of opioids when
205 treating patients for chronic pain and is also working towards treating substance abuse as a
medical problem rather than as a patient-facing crime. Narcotic suppliers, however, are expected
to be held to the law. These approaches seem to be creating positive outcomes and reduced harm
reduction within their communities (McCauley, 2019).

Portugal has decriminalized substance abuse and has focused on putting abusers in recovery
210 programs instead of prison. This has shown a substantial decrease in overdoses, HIV, and
hepatitis B and C disease (Policy, 2018). While this new law has proven to be successful in
reducing overall overdoses and illegal drug use, it is hard to differentiate how this initiative
affects overprescribing habits. However, this is a very successful retrospective technique when it
comes to preventing the increase of the opioid problem in Portugal (Policy, 2018).

215 Switzerland has a successful combination of retrospective and prospective approaches to the opioid problem. During the heroin problem in the 1990s, otherwise known as needle park (Hay, 2019), there were several programs that were set up. These prevention programs consisted of educating the public to increase awareness of the issues and risks, to prevent the use of heroin. Therapy programs focused on providing medical treatment and physiological support for
220 substance use disorders. Their approach to harm reduction looks to reduce the social and health consequences that come from drug use. This includes their needle exchange programs to reduce the spread of blood borne diseases (e.g., HIV/AIDS, hepatitis C and B) from reusing needles. With their ban on illegal drugs a new approach is defined by the use of harm reduction¹ techniques (McCauley, 2019). Due to the mitigating efforts combined with their therapy,
225 prevention, control and repression, in the past 10 years heroin related offences has dropped by 60% and the number of hospitalizations due to heroin use has significantly dropped (McCauley, 2019). This supports the idea that standards and policy development to combat the substance use disorders should also include a variety of mitigation efforts.

230 These approaches should be used in combination with each other to get the ideal results in preventing and treating substance abuse, no matter what country it may be located in. An example would be if someone is struggling with substance abuse disorder, they should have access to needle exchange programs and safe injection sites. At the injection site they should have the opportunity for therapy programs, or if they are found with illicit substances they are directed to therapy and rehabilitation instead of being sent to carry out a prison sentence. Based

1 The HRC considers the following principles central to harm reduction practice;

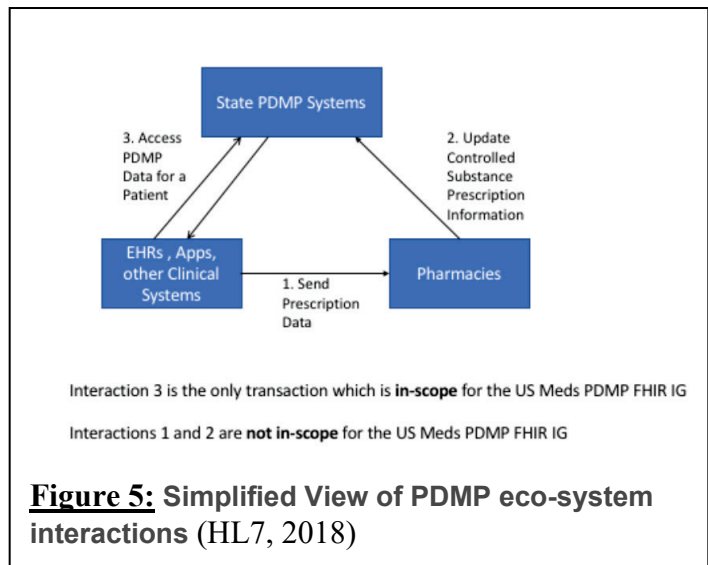
- “Accepts, for better and or worse, that licit and illicit drug use is part of our world and chooses to work to minimize its harmful effects rather than simply ignore or condemn them.
- Understands drug use as a complex, multi-faceted phenomenon that encompasses a continuum of behaviors from severe abuse to total abstinence, and acknowledges that some ways of using drugs are clearly safer than others.
- Establishes quality of individual and community life and well-being—not necessarily cessation of all drug use—as the criteria for successful interventions and policies.
- Calls for the non-judgmental, non-coercive provision of services and resources to people who use drugs and the communities in which they live in order to assist them in reducing attendant harm.
- Ensures that drug users and those with a history of drug use routinely have a real voice in the creation of programs and policies designed to serve them.
- Affirms drugs users themselves as the primary agents of reducing the harms of their drug use, and seeks to empower users to share information and support each other in strategies which meet their actual conditions of use.
- Recognizes that the realities of poverty, class, racism, social isolation, past trauma, sex-based discrimination and other social inequalities affect both people’s vulnerability to and capacity for effectively dealing with drug-related harm.
- Does not attempt to minimize or ignore the real and tragic harm and danger associated with licit and illicit drug use,” (Coalition, 2019).

235 off the successes in countries like Australia, Portugal, and Switzerland, the use of one or more of these approaches, especially decriminalization and needle exchange programs, should be utilized.

4 Prescription Drug Monitoring Program

240 A Prescription Drug Monitoring Program (PDMP) is a form of both prospective and retrospective prevention. It starts as a retrospective technique because most PDMPs are developed as a response to a substance abuse problem in a community so there can be a way to monitor the prescriptions for the substances that are being distributed. It utilizes a patient's prescription and dispensing data and helps inform a physician on a decision that can prevent further exasperation of an opioid use disorder. However, as more data is collected and utilized this becomes a
245 prospective technique for preventing an issue. Once referencing this prescription drug repository becomes a more practiced part of the workflow, it has the potential to prevent a variety of negative outcomes from prescription drugs.

250 A PDMP utilizes electronic health records to gather prescribing and dispensing data for controlled substances and create a repository of prescribed and dispensed drugs. The program is managed by the individual jurisdictions or parishes of a country (University, 2018). The information that is gathered by this program is only available to those who are authorized to see it, such as health care practitioners, pharmacists, and jurisdictional officers. The flow of information to and from a PDMP is displayed in **Figure 5**.



265 The information in a PDMP can be used by healthcare practitioners in a variety of ways to benefit patient health. If a physician is faced with an unknown patient, they can access the program and search for the dispensed medication history so they can make a more informed treatment decision. This can mitigate at risk behaviors for controlled substances and help physicians identify patients that are candidates for substance use disorder treatment/recovery programs. Access to PDPM data may also help the physician make informed decisions when prescribing medications that may have potentially harmful drug
270 to drug interactions. This would only be available for all possible prescribed drug interactions if the PDMP supported an all-drugs-all-patients set up as it is currently being used in Switzerland, Austria, and the United States (Nebraska). There are certain interactions that can be monitored for with only controlled substances like the increased risk of overdose when a patient is on opioids and sedatives.

275 PDMP data can be utilized by public health entities to monitor the status of the population by using registries that contain hospital discharge data. This can be used to determine overdoses where the outcome is survival rather than just gathering death data. Through Electronic Case

280 Reporting (eCR), PDMP data can be used to inform public health entities about what providers
may need to be notified about a recent overdose event. Non-fatal drug overdoses are far more
common than fatal drug overdoses with only 2-4% of overdoses resulting in death; as such
opioid related deaths (metric) provides a very narrow view of the epidemic status (Crime, 2018).
Approximately half of the drug users (47%) from several studies from across the world admitted
to having at least one overdose in their life (Crime, 2018). Electronic case reporting can help
analyze any correlations between prescribing and overprescribing, death rates, and overdoses.
285 The HIMSS 2019 Interoperability Showcase successfully demonstrated this².

A PDMP can play a role in disaster recovery³ because it would hold the dispensing information
for the people in a jurisdiction or parish. Many countries, states, and parishes have a stockpile of
medications put aside for the purpose of disaster recovery. If a natural disaster takes place, a
public health entity can access the PDMP, pull up the recent dispensed medications for patients
290 in the disaster area, and provide essential prescriptions that people need from the stockpile.

4.1 Standards

Standards that can be used to support a PDMP vary from country to country. The following
sections discuss standards used to support PDMPs in the United States, Australia, and the
European Union.

295 4.1.1 NCPDP

In the United States, the National Council for Prescription Drug Programs' (NCPDP) SCRIPT
standard is a message-based standard that was designed to query for a patient's medication
history. However, this is US centric and therefore not applicable for use in other countries. See
[https://www.healthit.gov/isa/allows-a-prescriber-request-a-patients-medication-history-a-state-
300 prescription-drug-monitoring](https://www.healthit.gov/isa/allows-a-prescriber-request-a-patients-medication-history-a-state-prescription-drug-monitoring)).

4.1.2 HL7^{®4}

HL7 has created a FHIR^{®5} implementation guide for Prescription Drug Monitoring Programs,
which was designed for use in the United States. While it serves as a great foundation for
international use, the specification may need to be expanded. For instance, the provider
305 information is referenced by DEA number and to get more specific information for the providers,
a secondary registry may need to be checked and this approach may not be available in all
countries. See <http://hl7.org/fhir/us/meds/2018May/pdmp.html>). HL7 also supports the v3

² [Opioid Crisis, the Person & the Population Part 1](#) and [Opioid Crisis, the Person & the Population Part 2](#)

³ The PDMP would need to be accessible by internet/web and cloud hosted or other hosting scenario that ensures
accessibility and redundancy.

⁴ HL7 is the registered trademark of Health Level Seven International.

⁵ FHIR is the registered trademark of Health Level Seven International.

messaging that is used in Canada’s CeRx standard that is used to support the Canadian PDMP. See <https://infoscribe.inforoute.ca/display/HL7V3/CeRx+4.4.2>

310 **4.1.3 IHE**

IHE’s Pharmacy Domain (PHARM) has specifications that support the exchange of medication history - Community Medication Prescription and Dispense (CMPD) and Community Medication List (PML) Profiles. These profiles were created for clinical use cases and include significant medication detail. The level of detail that is included in these profiles is a superset of data required for a PDMP program. IHE’s Quality Research and Public Health Domain (QRPH) provides the Prescription Repository Query (PRQ) Profile scopes the transaction and content used in PML to fit a PDMP program. These standards were designed for use cases that involve communications between the EHR and the pharmacy. The PRQ use case extends the exchange of this information to include business actors of HIEs and jurisdiction prescription drug monitoring repositories. See https://www.ihe.net/uploadedFiles/Documents/Pharmacy/IHE_Pharmacy_Suppl_CMPD.pdf and https://www.ihe.net/uploadedFiles/Documents/Pharmacy/IHE_Pharmacy_Suppl_PML.pdf.

4.2 Policy Trends

325 Government policies are an important part of examining substance use disorders and combating substance abuse within their countries. There are a variety of differences between each country and each jurisdiction in many countries when it comes to policy and policy development. Rather than focusing on the different intricacies of the policies of each country this section will focus on the popular themes that the policies try to support.

330 The most popular policy trend when it comes to combatting the opioid problem and illicit substance abuse is decriminalization for those who suffer from addiction. The theory behind decriminalization of all drugs, with the exception of being a distributor, is to reallocate efforts away from the punishment of having a substance abuse disorder and onto the treatment for the condition. This approach encourages patients to come forward for help and not worry about the negative repercussions of having taken part in illicit substance abuse. The most successful country with this approach is Portugal. The policy change has significantly reduced the number of overdoses and other negative health outcomes associated with injection drugs in the country (Policy, 2018). Several countries such as Colombia, Australia, the Netherlands, and many other countries have also taken on this approach (Tharoor, 2018). The effectiveness of the legalization of all drugs depends on the quality of the treatment resources. This may also include the need for support services that can help patients get referred to treatment centers and help them transition through their treatment process.

340 There are countries that have only partial legalization of drugs such as the United States and Canada, however the legalization does not extend to opioid substances (Tharoor, 2018). This form of legalization does not contribute to finding a solution to get those who suffer from substance use disorders into treatment. Even with the legalization of drugs such as cannabis, the

United States and Canada are still the countries with the leading death toll of opioid related deaths.

350 In combination with decriminalization of substance abuse, some government policies are looking into harm reduction approaches. The most popular harm reduction approach when it comes to opioids is the creation of needle exchange programs. These programs provide clean needles and supervised use of illicit drugs to those who are not seeking treatment. The purpose of these programs is to reduce the practice of reusing or sharing needles, which results in the spread of diseases such as HIV/AIDS and Hepatitis B and C. These program sites have trained medical personnel who are ready to provide any needed emergency interventions. There are many countries that have these programs set up as an approach to reduce the spread of HIV/AIDS however policy plays a large role in the availability of these programs. In countries where it is illegal to use and distribute these substances there is a clash between the illicit substances control policies and public health policies that support these programs (Allyn, 2019). There is a need to find a good balance between what is illegal and what needs to be provided to make sure that these programs can function as they were intended, to reduce the spread of blood borne diseases and overdose deaths. This approach cannot be effectively carried out in any country or jurisdiction with a zero-tolerance policy⁶ for illicit substance use because to focus is more on punishment rather than treatment.

365 Mandates and incentives for interoperability of electronic systems to increase the participation of technology in healthcare is an emerging approach to increase the quality of patient care. Interoperability is an important aspect in providing the quality of healthcare that patients receive while reducing the time and effort it takes to gather and analyze the appropriate data needed to treat the patient. In the context of opioids, interoperability can provide approaches to surveillance and tracking of opioid distribution and addiction factors such as quality measures, PDMP data, and death reporting. Countries in North America and the European Union have been either mandating or incentivizing interoperability between medical systems. However, mandating interoperability to PDMPs or opioid tracking systems that are similar to PDMPs is more complicated. When it comes to PDMPs there aren't many countries that have official PDMP system and of those countries the United States is the only one with legal legislation for participation in those programs. Canada doesn't currently have legal legislation for participation for the Canadian monitoring program and has only a 6.5% participation of physicians in the program (Canadian Institute for Health Information, 2018). The Netherlands that has a national electronic network do not need government mandates that require participation in PDMPs because the exchange of medical information already allows for the tracking that can be done via this system. Depending on the system there may be a need to have legislation of some type for the success of the program.

⁶ Zero-Tolerance Policy - a policy of giving the most severe punishment possible to every person who commits a crime or breaks a rule," (Merriam-Webster, 2019).

5 Implementations

In the past 10 years there have been developments of PDMPs in several countries with varying levels of maturity and standards across jurisdictions. These differences include but are not limited to; who has access to the systems, what entities maintain the systems, and the medications that are being monitored. While the United States⁷ and Canada⁸ utilize their own standards to create the PDMP system they are using HL7 standards to further support them. Specifically, the United States has been using the HL7 FHIR standard to support PDMP development. In the United States, Nebraska is the only state that collects all medications for all patients.

Other countries like Australia are starting to develop their own PDMPs which are relatively new and still working on increasing the efficiency of the program. Australia implemented a PDMP in Victoria last year with a state registry called SafeScript and is planning on extending this program to a federal national system (HAGGAN, 2018). SafeScript is linked to hospital medication management systems in Victoria and it is capable of showing the dispensed medication history for the patients for controlled substances (Department of Health & Human Services, 2018). Starting July 1st in 2019 Victoria will mandate the reference of SafeScript before the prescription of narcotics as a condition of being registered as a medical practitioner (McCauley, 2019). This will be too quick to adopt any changes into the standard, but necessary to combat the crisis.

Many European countries such as Switzerland and the Netherlands do not have an opioid problem to the extent that it is the in the United States and Canada but reports that the majority of their opioid problems come from heroin use more than other illicit form of opioids (Crime, 2018). The Netherlands has a national information exchange that has the capability of sharing prescribing and dispensing data. This system requires patient consent for practitioners to access this data. There is evidence that this is helping to spot doctor shopping and prevent counter fit paper prescription use. The Netherlands are in the process of banning paper prescriptions to avoid the use of counterfeit prescriptions all together (Golyardi, 2019). While in Switzerland the government is tracking all opioid prescription packages, this at a jurisdictional level rather than at a country level (Hay, 2019).

Countries similar to these have a variety of approaches to monitoring controlled medical substances. This varies in their crisis level and connection between the government and the medical system. Each of these countries have reported that the approaches that are taking place are successful in their respective countries, however this does not mean that there is no room for improvement in each of these systems. There is no single solution of implementation for all countries and many factors need to be taken into account before an implementation approach is taken up.

⁷ www.pdmpassist.org

⁸ www.namsdl.org

6 Conclusion

420 The opioid problem is wide spread, and the effects of opioids can be seen across the world In
countries such as Brazil, Australia, and several EU countries there is a visible opioid problem but
not to the extent of the United States and Canada (Crime, 2018). Those countries are trying to
treat the problem before it becomes an epidemic. The Netherlands has a health information
exchange set up and utilizes the electronic prescribing aspect of it. It is also reevaluating its
prescribing habits and has set up a practice of not prescribing opioids for long term, with the
425 exception of terminal cancer patients (McCauley, 2019). Australia is taking on several
techniques to prevent substance use disorders such as controlling the supply chain, no longer
recommending opioids for treating chronic pain, and decriminalizing substance abuse.

Illicit opioid use is harder to track and prevent and has become even more dangerous now that
opioids are being cut into other street drugs without the user's knowledge (BEBINGER, 2018).
430 While illicit use is the majority of the problem in many countries, these countries are setting up
PDMPs to help prevent the over prescription of opioids. From what is being seen in the United
States, there is a link between over prescription of opioids and illicit drug use (CDC, Vital Signs:
Overdoses of Prescription Opioid Pain Relievers --- United States, 1999--2008, 2011). It is not a
large issue in many other countries however there is some speculation in the EU that there is an
435 increase of opioid prescribing that may be feeding or leading into addiction (EMCDDA, 2018).

Current PDMP programs have shown that they can help reduce overdose death rates. Florida has
seen a 25% decrease in oxycodone related death since the implementation of their PDMP (Chris
Delcher, 2015). The lack of data is the hardest thing to work around because PDMPs cannot be
properly utilized without the data that is needed to support its function (Gary L. Cochran, 2015).
440 The development of health information technology is creating new and more accurate ways to
capture electronic data, and with that data, improve the usefulness of the PDMP. The
Netherlands has also seen an improvement in catching doctor shopping and false prescriptions
via electronic exchange (Golyardi, 2019).

IHE has created the PRQ Profile, inspired by PML and NCPDP SCRIPT, to assist with finding
445 the best approach for creating a prescription drug repository to utilize a PDMP. Use of the HIE
ensures clinical partners can use any third-party integrator with their EMR. IHEs supports and
encourages the use of HIEs for long term utilization and interoperability between the different
systems that need to provide information to and to utilize the information provided in a PDMP.

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