Implementing a decentralized opioid overdose prevention strategy in Mexico, a pending public policy issue

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Summary

The public health crisis due to opioid overdose is worsening in Mexico's northern region due to the introduction of illicitly manufactured fentanyl into the local drug supply. Though there is an increase in overdose deaths, there is no accurate report of overdoses by Mexican government agencies and no comprehensive opioid overdose prevention strategy. There is currently only an anti-drug marketing strategy which is likely insufficient to mitigate the growing epidemic. In order to address the growing opioid overdose crisis in the country, it is necessary to create and implement a decentralized prevention strategy, that includes naloxone distribution, expanded treatment services in regions most in need, and create active dialogue with community organisations already implementing harm reduction actions. Decisive action must be taken by the Mexican government to ensure the health and wellbeing of the Mexican citizens, especially those at high risk for opioid overdose.

Keywords: Overdose; Opioids; Opiates; Naloxone; Mexico

Background

North America is experiencing a public health crisis due to the increasing number of fatal overdoses from opioid use.[1–3] The increase has been exacerbated by the introduction of fentanyl into the drug supply.[4–6] In the United States (US) the rate of opioid overdose deaths doubled from 10.4 to 21.4 per 100,000 people between 2015 and 2020.[7] Similarly, in Canada, this number increased from 7.8 in 2016 to 20.9 in 2021, with a significant rise observed during the COVID-19 pandemic.[8,9] While Mexico has traditionally reported a lower number of opioid overdose deaths compared to the US and Canada, recent reports along the US-Mexico border reveal a growing presence of illicitly manufactured fentanyl (IMF) in the local drug supply.[4–6,10]

In Mexico, there is evidence of opioid use, but national official statistics reflect only insignificant numbers of related harms like overdoses. In contrast, local harm reduction agencies, especially along the US-Mexico border, are responding to an unseen crisis.[11] According to the most recent survey on drug use conducted in Mexico, the percentage of people who reported having used a drug at least once in their lifetime increased from 7.8% in 2011 to 10.3% in 2016, while heroin and opium use remained at 2% during that period.[12] Yet, according to the Mexican Ministry of Health, between 2013 and 2020, the number of people in treatment who had used fentanyl increased from 5 to 73, and the number of deaths from mental and behavioural disorders due to opioid use increased from only 4 to 11 deaths.[13] Nonetheless, community-based efforts show that this information is underestimating the true number of overdoses in the country.[11,14]

Mexico has a long-standing history of being a major producer and distributor of heroin. Cultivation of opium poppies was most prevalent in the mountainous regions along its Pacific coast.[15] Over the past fifteen years, the production of drugs in Mexico to meet North American demand, combined with the government's response to this issue, has led to a significant surge in violence throughout the country. There is compelling evidence that a large portion of this increase could be attributed to criminal organisations competing for a share of the heroin market.[16] With the surge in the use of IMF in the United States, the demand for Mexican heroin plummeted sharply in recent years.[17,18] This brought upon a

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shift in production and trafficking trends in Mexico. For example, a fentanyl production laboratory was discovered in the state of Sinaloa and shipments of fentanyl precursors originating from China were seized in Michoacán.[19,20]

A comprehensive decentralized strategy on opioid overdose prevention is needed in Mexico that is based on public health evidence to avert the ongoing increase in opioid related overdoses, as seen in the US and Canada. Here, we outline some of the current challenges related to opioid overdose prevention and potential solutions for Mexico.

Deficient overdose surveillance in Mexico

First, Mexico needs a comprehensive nation-wide overdose surveillance system. Due to the lack of reliable overdose data in Mexico, it is difficult to observe the temporal trends and their prevalence around the country. However, accounts from local harm reduction organisations confirm that Mexico is experiencing an increase in the incidence of opioid overdoses as a consequence of the growing availability of opioids adulterated with IMF.[5,6]

To date, there is no reliable data on opioid use, non-fatal, or fatal overdoses. However, the president of Mexico recently recognised the need to adequately monitor the number of overdoses in the country.[21] The Forensic Medical Services and local hospitals or medical providers serve as the initial source for potential information on overdose deaths. Yet, it is extremely rare that those responsible for issuing death certificates in Mexico will register drug-related deaths as an overdose. One reason being that not all hospitals or forensic services have the necessary reagents to determine the presence of specific substances.[22] Another source of data could come from the calls that activate the emergency response system (e.g., 911 dispatches); however, this information is not publicly available.[11]

According to data from the Ministry of Health, between 2011 and 2020, 105 people died from "mental and behavioural disorders due to opioid use". The border states of Baja California, Sonora and Chihuahua accounted for the highest number of opioid-related deaths during this period.[13] According to data from the Epidemiological Surveillance System of Addictions, only 19 people died from opium or morphine use in 2020, and fentanyl related deaths were not reported.[23] This is likely an underestimate of the true prevalence of opioid-related overdose deaths in Mexico, a country with a population of close to 130 million inhabitants.

In turn, field researchers documented a much higher number of non-fatal opioid overdoses, especially with the introduction of IMF. For example, an ethnographic study conducted in three northern border cities (Tijuana in Baja California, San Luis Río Colorado in Sonora, and Ciudad Juarez in Chihuahua), found that 66% of people included in the study had experienced an opioid overdose, and that on average they had experienced close to four opioid overdoses in their lifetime.[24] Likewise, another study in the city of Mexicali on a community-based opioid overdose care program found a total of 460 non-lethal overdoses between the summers of 2019 and 2021.[11] The number of overdoses increased after the start of the COVID-19 pandemic and the introduction of IMF in the local drug market. Taken together, these data reinforce the notion that government agencies underestimate opioid overdoses in the country, especially in recent years.

Potential solutions

Create mechanisms and materials for recording overdoses in community settings and emergency services. Make data publicly available. Ensure hospitals and forensic medical services have necessary reagents to investigate suspected overdose deaths.

A strategy of stigma and fear

Second, the current administration's approach to substance use has been from a moral rather than a public health perspective.[25] For example, the main strategy for substance use prevention under the current administration is that of anti-drug public service announcements.[26] This media campaign launched by the National Addiction Prevention Strategy first used the slogan "There is no happy ending in the world of drugs", later changed it to "The world of drugs is not a happy place" and finally "If you do drugs, you hurt yourself". Among other things, some of these campaigns further suggest that most people who use drugs (PWUD) do so because they are not happy,[27] and the president has publicly called for the stigmatisation of substance use.[28] Now, the Ministry of Education is set to launch a drug awareness training program for middle and high school professors across the nation, inspired by two criticized abstinence-based programs: the "Safe Schools" strategy implemented in Mexico in 2008 and the D.A.R.E. strategy in the United States.[29,30]

The strategy regarding opioids has primarily focused on IMF, disseminating messages such as, "Fentanyl kills. Sometimes even with the first dose". Some of the information provided has been misleading, such as claims that fentanyl can be found in eye drops and candy.[31] These messages have been broadcasted nationwide even though opioid use is mostly affecting communities along the northern border. Further, these messages are amplified, misrepresented, and misinterpreted over social media platforms and text messaging services. False information can undermine the credibility of accurate messaging and confuse the public regarding risks associated with opioid use. Historical lessons from 100 years of drug education in the US have shown that these types of messages, which

convey strict abstinence, are not as effective in reducing substance use when compared to messages that encourage informed choice from a harm-reduction perspective.[32] In this sense, the national campaign against addictions "Together for peace" (*Juntos por la paz*) fails to provide information on how to detect and respond to an opioid overdose, rendering it useless in response to a public health problem.

In addition, the current administration has been notorious for not making data publicly available, disallowing the evaluation of the impact of this strategy on the population (e.g., the number of people who have been assisted on the government's 1-800-drug-helpline). For example, the National Commission Against Addictions (CONADIC) responded to a freedom of information requests on the cost of the campaign by stating that the information did not exist (Freedom of information request number: 0000400221221, and 0210000137221).

Potential solution

Design evidence-based campaigns and trainings focusing on substance use treatment, and opioid overdose reversal using naloxone, with public health aspects of substance use and harm reduction.

Human rights violations

Third, PWUD in the country are faced with criminalisation, violations of human rights by public security forces, and limited access to evidence-based treatment. Even though legislation was enacted in Mexico that decriminalized the possession of small quantities of illicit substances for personal use and syringe purchase and possession without prescription, PWUD frequently report extrajudicial arrests for drug and syringe possession.[33,34] PWUD are often extorted and/or forced into drug treatment.[35–37] The first-ever resolution on human rights violations against a municipal government in Mexico has officially documented all of these issues, in response to the mistreatment of PWUD in the city of Mexicali, as well as concerns raised by local organisations.[38]

Poverty and drug-related violence have also fuelled the proliferation of informal and coercive centres for substance use-disorder in the country that exacerbate the suffering of its residents through forceful rehabilitation techniques.[39] The majority of people who receive treatment in Mexico do so at abstinence based residential facilities that are not certified by the government, and many times people accessing these services are mistreated (e.g., physical or verbal abuse, denial of medication, theft, physically restraint, or sexual abuse).[39–41] PWUD (including opioids) are exposed to higher overdose risk when they are released from these drug treatment facilities.[37] Research including data from Mexico shows that people who undergo coercive drug treatment are more likely to suffer a non-fatal overdose than people who do not.[42] Therefore, PWUD are exposed to higher overdose risk when they are released from these types of drug treatment facilities in Mexico.[37]

Recent efforts by local harm reduction organisations have focused on providing naloxone to those PWUD that are most at risk of an opioid overdose. However, the militarisation of the northern border made it more likely for other security forces, such as the recently created National Guard, to confiscate the tools that might prevent fatal opioid overdoses. This new militarised national police lacks human rights training, and local harm reduction organisations in the northern cities of Tijuana and Mexicali are hearing more and more testimonies of abuse and dispossession of the naloxone, syringes, and pipes that they distribute (personal communication with frontline workers).

Prior efforts to train police officers in harm reduction and occupational safety in Tijuana were effective in aligning public health and safety goals.[43,44] From February 2015 to May 2016, a group of researchers from both Mexico and the US implemented a training program on occupational health, drug laws, and harm reduction strategies among the entire police force in the municipality of Tijuana, which resulted in surveys showing that 86% would refer people to overdose prevention sites.[43,44] As a result of these efforts, there has been a positive change in the behaviour of some police officers in the city of Tijuana. They have now begun to request naloxone from local harm reduction organisations, allowing them to respond promptly to overdoses during their shifts rather than waiting for other emergency services to arrive (personal communication with frontline workers). These programs should be mandatory for all security forces who are in hotspot areas for opioid overdose in the country.

Potential solutions

Provide training programs on harm reduction and occupational health for members of law enforcement and security forces of all three levels of government, as well as improve access to evidence-based solutions such as agonist maintenance plus psychological and extended release antagonist maintenance treatments.[45]

Limited access to evidence-based treatment

Fourth, access to medication for opioid use disorder (MOUD) is limited. Worldwide, methadone has been the most common MOUD since it was first approved in the US in 1972.[46] Even though methadone is available in Mexico, scale-up is severely restricted. Prior to 2019, only 2 government clinics and 16 private clinics provided methadone in the country.[10] Issues regarding unaffordability, limits on high dosages, and lack of the medication are common.[47–50] Recently, the main pharmaceutical producer of methadone in Mexico was shut down by the Mexican Federal Committee for Protection

from Sanitary Risks (*COFEPRIS*) leading to a lack of access for patients in treatment.[50]

As of December 2022, methadone is only available at two public services in Tijuana and Ciudad Juarez, and its delivery is limited to currently enrolled patients who are expected to complete treatment within 28 days. This approach has resulted in several individuals experiencing relapses and seeking help from local harm reduction services in their communities (personal communication with frontline workers). Buprenorphine (a drug approved for the treatment of OUD in the US since 2002) is available by prescription, but only as a treatment for pain, while suboxone and long-acting injectable naltrexone are not available.[10] Compared to patients receiving MOUD, untreated patients are at higher risk of fatal overdose.[51] For this reason, improving MOUD coverage is paramount for reducing overdose deaths in Mexico.

The best way for improving access to MOUD is through a free distribution program of methadone and adapting other medications such as buprenorphine. The Dutch model of care for opioid use disorder can serve as an example for Mexico. One of the key features that make this model successful is that methadone is provided by general practitioners and through the municipal health service, a decentralized exercise of health service.[52,53] Currently, the Mexican health system is experiencing a major reorganisation. The major government program to improve health is *IMSS-Bienestar*, which seeks to centralise existing health services at the state level in the Mexican Institute of Social Security (IMSS) to guarantee access to healthcare services for people without social security.[54] Consistent access to MOUD and naloxone for people using opioids should be one of the health system's priorities in the current climate.

Potential solution

Implement a free national low-barrier opioid treatment scheme with medications such as methadone or buprenorphine.

Lack of naloxone

Fifth, Mexico needs to make naloxone accessible for people at risk of opioid overdose. Naloxone distribution is an evidence-based intervention for the reversal of an opioid overdose.[55] Naloxone acts as an antagonist at the opioid receptors, it is safe (as even the administration of large doses has no adverse effects), and has no abuse potential (as it does not produce changes in mood, hallucinations, or effects consistent with central nervous system depressants or stimulants).[56–58] There are several formulations of naloxone that differ in dosage, route of administration (injectable and nasal spray), and cost. The US Department of Health and Human Services has identified Naloxone access as one of its top three priority areas for addressing the opioid crisis and responding to opioid overdoses.[59]

Observational evidence supports the effectiveness of Overdose Education and Naloxone Distribution (OEND) programs in reducing opioid overdose deaths. A study in Massachusetts found that communities with OEND had lower overdose death rates than those without the program.[60] The Harm Reduction Coalition surveyed 50 naloxone distribution programs in the US in 2010, finding that they had trained and distributed naloxone to over 53,000 people, resulting in 10,171 reported overdose reversals.[61] A pre-post study of Scotland's Naloxone National Program showed a reduction in the proportion of opioid related deaths among individuals released from prison.[62] Altogether, this evidence demonstrates the potential of providing overdose education and naloxone to reduce opioid overdose mortality.

Despite ample evidence supporting the effectiveness of naloxone in reducing opioid overdose deaths, Mexico currently classifies the drug as a medication intended solely for hospital use and registers it as a psychotropic agent.[63] This classification restricts its availability and accessibility, as individuals must obtain a prescription to purchase naloxone and it is not available at most pharmacies.[11,64] This stands in contrast to many other jurisdictions where naloxone is available over-the counter without prescription (e.g., US, Canada, Australia), highlighting the need for more accessible and less restrictive regulations to increase access to this life-saving medication.[65–67] Additionally, naloxone in Mexico is bought by national hospitals at costs that are difficult to absorb by other community organisations. Currently, there is no government-based mechanism for community organisations to obtain naloxone for community distribution. In a patchwork solution, community-based harm reduction organisations depend on naloxone donations from international agencies.

Due to the limited availability of naloxone in the country, people experiencing an opioid overdose undergo practices that are not evidence-based and may otherwise be harmful. These include injecting salt water or administering other illicit substances like methamphetamines in order to reverse the overdose.[24] However, through training programs on opioid overdose care, changes in behaviour have been documented, with a greater emphasis on other techniques such as cardiopulmonary resuscitation when responding to an opioid overdose.[11] In addition, the limited availability of naloxone is further seen by the number of doses administered by community-based opioid overdose reversal programs on the northern border. In Mexicali, Baja California, a community based opioid overdose reversal program instituted at a safe consumption site applied 445 naloxone doses (in 95.9% of the cases) between June 1, 2019 and May 31, 2021.

Potential solution

Provide and train people most likely to witness an overdose with naloxone, such as PWUD, family members, emergency services and security forces.

An insufficient change in the law

A bill was introduced to the Mexican Senate on February 18, 2021 to remove naloxone as a psychotropic substance in Mexico's General Health Act.[68] To date, the initiative has not been approved, suggesting that the legislature does not consider harm reduction for opioid use to be relevant, despite the scaremongering of public governmental messages around IMF (e.g., public service announcements). During a recent morning briefing, the Mexican President declared that naloxone "prolongs the agony of people".[69] This could potentially impede efforts to enact significant legislative changes related to drug policy during the reminder of the federal administration.

The legislative initiative is a necessary, although insufficient step toward having an impact on opioid overdose prevention in the country. The main problem with this bill is that though it declassifies naloxone as a psychotropic substance, it does not create any other opioid overdose prevention strategy to further the efforts. Historical evidence from the US has shown that declassification is not enough to prevent a significant number of overdoses. Rather, an active process to ensure the acquisition of the medicine into the hands of people most at risk is needed and encouraged.[70]

Even if this minimal and simplistic legislation passes during the current, or in an incoming administration in 2024, there is a risk that no further meaningful action related to opioid overdose prevention occurs. This may lead to the unintended consequence of extinguishing the sense of urgency in addressing opioid overdose at the national level. Since the government has no program to assume the financial costs of naloxone distribution, these costs will be transferred to people who use opioids, their families, or community organisations that are already doing the work on a voluntary basis through donations. In Mexico, injectable naloxone costs around 500 pesos (approximately 25 USD), while on the other side of the border it can be available for a low-cost (approximately 2.50 USD) for certain community programs.[22,71] Key issues in the effort to reduce opioid overdoses include the distribution of naloxone at the community level, making the medication affordable for harm reduction efforts, or the establishment of an organisation to develop meaningful lines of action (e.g., CONADIC, Ministry of Health).

Potential solution

Enact legislation to de-classify naloxone and provide a mechanism for community-based organisation to acquire and distribute naloxone.

A path forward

A national opioid overdose prevention strategy should be a decentralised exercise, designed to focus on the regions that experience this problem daily, and not exclusively from a centralist perspective. This could lead to the implementation of regional solutions and create local synergies across the border, for example, through pilot programs in Baja California, Sonora, and Chihuahua—the states with the highest opioid related deaths.[13] An opioid overdose prevention strategy designed from the local governments should include successful evidence-based best practices from other countries along with the accumulated knowledge from the organisations that have been carrying out this task in the country, as well as the representation of PWUD, remembering that: "Nothing about us without us".

As Table 1 shows, some of these lessons may include, but are not limited to: 1) create mechanisms and materials for recording overdoses in community settings, forensic medical services, and emergency services; 2) design evidence-based campaigns and training on substance use treatment and opioid overdose care with naloxone such as talks and workshops to law enforcement members of the three levels of government and decision makers to sensitize them on public health issues; 3) provide training programs on harm reduction and occupational health for members of law enforcement and security forces of all three levels of government; 4) implement a free national opioid treatment scheme with medications such as methadone or buprenorphine, substance testing, syringe exchange, and overdose prevention rooms; and 5) provide and train people most likely to witness an overdose with naloxone.

While opioid use has historically been concentrated along Mexico's northern border, the detection of fentanyl-positive results in heroin in Mexico City (as reported by frontline workers) suggests that new areas of opioid overdose may be emerging in the country. This highlights the urgent need for drug policy to address the evolving drug landscape and prevent further harm. For these reasons it is paramount to build a national strategy using local knowledge to prevent widespread influx of fatal, and non-fatal overdoses. A national overdose prevention strategy should start by empowering local authorities to respond to their particular needs while fostering cross-border initiatives. Prevention is key in having a rapidly scaled up strategy to combat the rise in overdoses as opioid use is likely to expand to other regions in the mid- or long-term. As mentioned in the opening section, the president of Mexico has produced mixed signals in addressing opioid overdose, recently acknowledged the need for proper overdose reporting in the country, but criticizing the increased accessibility of naloxone in US pharmacies. However, we do not yet know how or if anything will be done.

Factors that put the country at risk	Potential measures to limit risk factors
Lack of a comprehensive overdose surveillance system.	Creation of mechanisms and materials for overdose documentation in community settings, forensic medical services, and emergency services (e.g., Red Cross and police).
A national campaign that approaches substance use from a moral rather than a public health perspective.	Design evidence-based campaigns and training on substance use treatment and overdose care with naloxone such as talks and workshops to law enforcement members and decision makers rooted in harm reduction and public health.
Criminalization and violation of human rights of people who use substances by public security forces.	Harm reduction and occupational health training programs for members of the security forces of the three levels of government (e.g., municipal and state police, National Guard, Army and Navy).
Limited access to evidence-based interventions to minimize the risk of opioid use disorder.	Implement a free national opioid treatment scheme with methadone or buprenorphine, substance testing, syringe exchange and safe consumption rooms.
No availability of naloxone in community overdose prevention schemes and emergency services (e.g., Red Cross and police).	Equip and train those most likely to witness an overdose (e.g., key populations, community organizations, and emergency services) with naloxone.

Table 1: **Summary of factors that put Mexico at risk of developing an opioid overdose epidemic and interventions to mitigate risk factors.**

Limitations

The prevention of lethal and non-lethal opioid-related overdoses is a complex issue that demands comprehensive solutions and a multi-faceted approach. The five-axis prevention strategy outlined in this article is not without its limitations. One of the primary limitations is the lack of complete and accurate data on the extent of overdoses in Mexico. This limitation restricts the ability to fully understand the magnitude of the problem and to design public policies with complete information. Additionally, the empirical evidence we have so far is mainly focused on the northern border regions of the country, which may not be representative of other regions where different factors may contribute to the risk of overdose.

Overall, while the proposed strategy is promising, there are several limitations to its implementation that should be considered. More research is needed to better understand the magnitude of the problem, the broader social and structural factors driving the overdose crisis in Mexico, and the feasibility and cost-effectiveness of the proposed strategies we propose.

Conclusion

Mexico may be in the midst of an overdose crisis similar to that experienced in the US and Canada[10,72]—yet, masked due to the lack of reliable overdose data. This is particularly the case in regions along the country's northern border where different drug markets converge and are experiencing the growing availability of new synthetic opioids such as IMF. The bill introduced in February 2021 to remove naloxone from the catalogue of psychoactive substances in the General Health Act has not yet been approved, which suggests a lack of political will to address the opioid overdose problem in Mexico. This law is insufficient to address opioid overdoses in the country, let alone the looming crisis. A simple way to remedy the problems of this law modification could be through the inclusion of a transitory article establishing the obligation of the Mexican government to create and implement a national and decentralized opioid overdose prevention strategy and a free naloxone distribution campaign.

To date, the government has turned its back on reducing harms by defunding harm reduction organisations that provide sterile syringes or HIV screening and prevention. Despite the difficulties imposed by the Mexican government, it is essential to initiate a dialogue with the community organisations that help prevent overdoses while supporting PWUD in those communities, as they are the ones who have made it possible to contain this public health crisis so far, often despite the difficulties imposed by the Mexican government. Evidence of illicitly manufactured fentanyl in the central region of the country may pose a risk for consumption in that region of the country that has a potential to expand beyond. With the knowledge of local organisations already facing the problem, an evidence-based national strategy can be created. This strategy should be decentralized, including the funding and empowerment of local authorities.

Contributors

RBR was responsible for conceptualization; writing the original draft; editing; and supervision. JASL was responsible for conceptualization; writing and review; editing; and supervision. SSP was responsible for writing and review; and editing. ACR was responsible for writing and review; and editing. LAC was responsible for writing and review; and editing. AS was responsible for writing and review; and editing. JJRV was responsible for writing and review; and editing. DGM was responsible for conceptualization; writing and review; editing; and supervision.

Declaration of interests

The authors declare they have no competing interests.

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