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Averting Damage from the Opioid Crisis in California

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By

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Abstract

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The opioid crisis in California has worsened significantly every year since overdose deaths peaked in 2009, leading to increasing hospitalizations and deaths from opioid overdoses. This research project conducts a qualitative analysis of archival research data to examine the underlying causes of opioid addiction or abuse throughout California. PubMed Central (PMC)'s database was used to find peer-reviewed scholarly articles relating to the opioid crisis. Common barriers to combating the opioid overdose epidemic were found to include geographic and socioeconomic status, sexual orientation, and racial disparities. State-level policies and primary and secondary interventions should address these barriers. From analyzing the literature, I present recommendations on how to alleviate the opioid epidemic.

Section 1: Introduction

According to the Centers for Disease Control and Prevention (CDC), the United States is in the midst of an opioid overdose epidemic. Opioids (including prescription opioids, heroin, and fentanyl) killed more than 42,000 people in 2016, more than any year on record. Forty percent of all opioid overdose deaths involve a prescription opioid (CDC, 2017). Drug overdose deaths and opioid-involved deaths continue to increase in the United States, among both men and women of all racial/ethnic groups and ages.

The United States has struggled with opioid abuse since before the 1900s, but the problem persists to this day. It started in the early 1900s when morphine was introduced to treat injured Civil War veterans, who subsequently became hooked on opioids. In 1898, the Bayer Company started producing of another opioid called heroin on a commercial scale. From the first clinical trials, it was considered a “wonder drug” whose effect could be amplified by injecting to use as a cough suppressant (Moghe, 2016).

By the mid and late 1970s, Percocet and Vicodin – prescription opioids to treat chronic pain – had been introduced onto the market. Doctors had been taught to avoid prescribing highly addictive opioids to patients. In the early 1990s, OxyContin was launched onto the market, increasing the number of painkiller prescriptions filled at U.S. pharmacies each year from two to three million each year (Moghe, 2016).

From 1999 to 2016, more than 350,000 people died from an overdose involving any opioid, including prescription and illicit opioids. According to the CDC (2017), the rise in opioid overdose deaths can be outlined in three distinct waves: the first wave began with increased prescribed of opioids in the 1990s, with overdose deaths involving prescription opioids increasing since at least 1999. The second wave began in 2010, with

rapid increases in overdose deaths involving heroin. Lastly, the third wave began in 2013, with significant increases in overdose deaths involving synthetic opioids – particularly those involving illicitly-manufactured fentanyl (IMF). The IMF market continues to change, and IMF can be found in combination with heroin, counterfeit pills, and cocaine (CDC, 2017).

In this study, I conduct a qualitative analysis of archival research data on the opioid crisis throughout California. I also discuss treatment plans and possible solutions to the opioid crisis.

Section 2: Methodology

I conducted a review of the literature by using PubMed Central (PMC), an archive of biomedical and life sciences journal literature, and the Google Scholar search engine to find peer-reviewed scholarly articles relating to the opioid crisis. The research articles provide both old and current data from one-on-one surveys in major California cities on opioid treatments. I first screened articles based on their titles and abstracts for a focus on my research topic, followed by the full text. Keywords used include “opioid”, “prescription drugs”, “addiction”, “opioid crisis”, “opioid abuse”, “opioid epidemic”, “drug overdose”, “opioid poisoning across urban and rural areas”, “illicit drug use”, “pain medication”, “substance abuse treatment”, “Prescription Drug Monitoring Program”, “opioid prescription in California”, “doctor shopping”, “multiple prescribers”, “CURES”, “Methadone Maintenance Treatment”, “naloxone”, “detoxification”, and “opioid therapy”.

Section 3: Literature Review

Problem – Geographic Disparities and Socioeconomic Disparities

According to the CDC Morbidity and Mortality weekly report, there was a counterfeit Norco poisoning outbreak in San Francisco Bay Area, California between March 25, 2016 and April 5, 2016. Seven cases of intoxication by counterfeit Norco were identified by the San Francisco Division of the California Poison Control System (Vo et al., 2016). Prior to this outbreak, the counterfeit products containing promethazine had been found in cough syrup. The distribution of counterfeit medications containing fentanyl is a serious public health threat that needs to be monitored by healthcare providers.

Novak et al. (2016) examined the initiation patterns among different birth cohorts of people who used prescription opioid pain relievers and heroin usage. Data from a community-based study of 483 intravenous drug users in Los Angeles and San Francisco who reported lifetime use of both heroin and nonmedical prescription opioids were collected between April 2011 and April 2013. Also, the researchers analyzed data from 1,264 individuals aged 18 and older from a general population survey, the National Survey on Drug Use and Health (NSDUH). They found that individuals who were born after 1980 were more likely than individuals born before 1980 to initiate opioids through nonmedical use of prescription opioids than heroin.

A study by Cerda et al. (2017) examined 18,517 residents affected by opioid poisoning in California, the most populous and ethnically diverse US state, between 2001 and 2011. Data from the California Office of Statewide Health Planning and Development were obtained to determine zip code-level counts of hospital discharges

related to opioid poisoning (PO). The study found that prescription drugs (i.e., methadone or other opiates and narcotics) are correlated with growth in PO-related hospital discharge, pharmacy related, economic stressor (i.e. household income, poverty, and unemployment rate) and concentration of manual labor industries. In addition, there was a large poisoning spread from rural and suburban or exurban hot-spots to urban areas. They also found that there is an effect of manual labor industries on PO poisoning due to higher levels of chronic pain and work-related injury. Also, PO poisoning discharges were concentrated in areas with lower household income, but lower rates of unemployment. PO related hospital discharge may proliferate in rural areas, particularly workplace-related source of medical need and lower income household. Researchers suggest that policies need to address work-place-related needs for pain management and invest in screening and treatment programs for PO abuse in communities with a high prevalence of manual labor occupations.

In a cross-sectional study by Saab et al. (2016), patients with liver disease who were seen for follow-up at the Pflieger Liver Institute, University of California, Los Angeles from June 2015 to August 2016, were administered a 13-item questionnaire. In addition, information was obtained from their medical records. The authors found that patients with liver disease are at high risk of poor outcome from acetaminophen overdose. They concluded that liver disease patients with critically low levels of knowledge of acetaminophen are at risk of acetaminophen overdose, as well as under-medication and inadequate management of chronic pain. They recommend an increase in culturally competent education efforts regarding acetaminophen dosage and its safety in the setting of liver disease. Also, promoting education in those at risk for low

acetaminophen knowledge is essential to minimizing acetaminophen overdose burden and optimizing pain management (Saab et al., 2016).

United States military veterans represent a particularly high-risk population for illicit substance use and abuse. Veterans also have high rates of mental health conditions that further increase risk for non-medical use of prescription opioids (NMUPO). A study of Banerjee et al. (2016) examined the relationship between new onset NMUPO and heroin initiation among veterans. The research study utilized data from the Veterans Aging Cohort Study (VACS), which enrolled over 7,000 patients from infectious disease or general medical clinics in Atlanta, Baltimore, Houston, Los Angeles, Pittsburgh, and Washington D.C., and multiple sites in New York City. A total of 3,396 HIV-infected and uninfected patients enrolled in the VACS who reported no lifetime NMUPO or heroin use were followed from 2002 to 2012. Participants in VACS are similar to other veterans receiving care within the VA, with the exception of participants being older and more predominantly Black. The study was conducted using responses to two different survey questions, including what type of drugs was used and how often was being used. The results indicated that prior or concurrent NMUPO and initiation of heroin use are strongly associated, underscoring that there is a need for screening and treatment for NMUPO patients who are at high risk for heroin initiation to be improved.

Problem - Sexual Orientation

Among individuals of all ages, the prevalence of opioid users has increased two-fold over nine years. “Doctor shopping” is one of the most common methods by which drug abusers obtain prescription opioids for non-medical use. It refers to a scenario whereby a patient seeks prescriptions from multiple providers without revealing to each

prescriber that other sources are involved. This practice has led to financial losses for insurance companies due to fraudulent prescriptions and related medical services (Han et al., 2014). In 2008, Medicare recipients who “shopped” for doctors were at risk for spending over millions of dollars.

A study by Han et al. (2014) utilized data from the California Prescription Drug Monitoring Program (PDMP) to examine age and gender-specific trends of Schedule II opioid use from 1999 to 2007. For each year in California, the prevalence of doctor shoppers was similar between 18-24-year-old and 45-64-year-old schedule II opioid recipients and more than twice as high as that among those over 65. With that said, the younger generation have a higher prevalence of opioid addiction than those who are over the age of 65. The proportion of schedule II was higher in the younger age group than in the older age group. In addition, California’s Schedule II opioid use among general recipients and doctor shoppers substantially increased across individuals of all ages between 1999 and 2007. Sex and age-specific differences in the prevalence among age and gender groups were relatively small. It is recommended that real-time data be used to closely monitor doctor shoppers to control the risk of overdose for all ages and gender groups.

Another study by Han et al. (2012) gathered data from California’s statewide prescription drug monitoring program (PDMP) to examine the factors associated with the use of multiple prescribers and pharmacies for prescription opioids. By using the real-time database, Controlled Substance Utilization Review and Evaluation System (CURES), the authors found that the most county-level physicians or robust area have most prescribed. In addition, 18-45-year old and females were more likely to use

prescribers and pharmacies for opioid prescriptions. Median household income was a small factor: a higher proportion of high school dropouts used multiple prescribers and pharmacies for prescription opioids.

Problem – Racial Disparities

Visconti et al. (2015) examined 331 individuals in San Francisco who died from an accidental opioid overdose between 2010 and 2012, using a database collected from the California Electronic Death Reporting System (CA-ERDS). They found that 310 cases involved prescription opioids, 31 involved heroin, and ten involved both heroin and prescription opioids. In addition, the median age at death was 50 years; 68.3 percent were men, 71.0 percent were non-Hispanic whites, and 19.9 percent were African-American. Based on the data collected, middle-aged, non-Hispanic white males were the most affected in San Francisco. Most deaths involved highly potent prescription opioids.

In contrast to Visconti et al. (2015)'s study, Yazdanshenas et al. (2016) found that older adult African-Americans who experience pain are especially high-risk for under assessment and treatment. Recent reports from the Institute of Medicine (IOM) confirm that African-Americans are less likely to obtain pain assessment and management. With that said, adult African-Americans are one of the most vulnerable populations, whose health and quality of life are more affected by pain, compared to the White population. The researchers examined the pattern and correlations of pain medication use that include severity of pain, medical condition, and access to care. Four hundred African-American older adults aged 65 years and older were recruited from 16 churches located in South Los Angeles. Forty-seven percent used at least one type of pain medication. Pain medication was classified into the following categories: non-opioid, opioid, adjuvant

drug, and other drugs. The study conducted face-to-face interviews, where each participant's medication was visually inspected, and each participant was provided with a monetary incentive (Yazdanshenas et al., 2016). The researchers found that older underserved African-American adults severely mismanaged pain, multiple providers, individuals with co-morbidity, and limited access to health care. In addition, the results showed that a large number of participants with severe pain either engaged in Potentially Inappropriate Medication (PIM) use or do not take pain medication at all.

Section 4: Treatment / Solution

The studies reviewed assess the effectiveness of opioid treatments and possible solutions, including detoxification treatment, long-term opioid therapy, naloxone treatment, Civil Addict Program, Methadone Maintenance Treatment (MMT), and patient-physician relations.

Using 1991-2012 statewide administrative data obtained from the California Outcome Measurement System, Nosyk et al. (2014) studied short-term detoxification treatment and long-term maintenance treatment, primarily with methadone, among study participants. California treats the largest population of opioid dependent individuals and is among a small group of states that apply regulations for opioid treatment. The analyses revealed high rates of detoxification treatment for opioid dependence in California throughout the study period and decreasing odds of success in repeated attempts at detoxification.

Von Korff et al. (2008) studied the characteristics of opioid use episode for non-cancer pain and define a threshold for the transition into Defacto Long-Term Opioid Therapy. As we all know, millions of Americans now receive opioid therapy for chronic non-cancer pain, but little is known about the duration. The article used CONSORT (CONsortium to Study Opioid Risks and Trends) to examine participant adult members of two health plans – Group Health Cooperative (located in Washington State) and Kaiser Permanente of Northern California – from 1997 to 2006. Both health plans serve older populations who are enrolled in Medicare and lower income populations insured by Medicaid and State health insurance programs. Since both health plans are from different states, they have to follow pharmacy state regulations on dispensing opioid medications.

Based on their study, Defacto Long-term Opioid Therapy accounted for a small percentage of the opioid use episodes for non-cancer pain in the study population. The threshold for Defacto Long-Term Therapy provides a possible checkpoint at which prescribing physicians and health plans could document treatment plans.

An article by Sporer et al. (1996) investigates clinical outcomes in a cohort of opioid overdose patients treated in an out-of-hospital urban setting for high prevalence of IV opioid use. Opioid-related overdoses are a common toxicology overdose in urban settings. The treatment for opioid-related overdoses with naloxone may be one of the more effective therapies reduced in the out-of-hospital ground. The research was performed in 1993 by the San Francisco emergency medical services (EMS) system and urban advanced life support (ALS) EMS system. All of their patients received naloxone as part of their out-of-hospital care in 1993. Most of their patients responded to naloxone. In addition, intramuscular (IM) mask ventilation was effective, whereas opioid-overdose patients with cardiopulmonary arrest did not survive. To conclude their research, administering naloxone with hypoventilation is probably one of the most effective out-of-hospital treatments for opioid overdose, except for patients who show advanced signs of deaths.

Nosyk et al. (2013) gathered data from California who were enrolled in the Civil Addict Program dated from 1962 onwards by use of a natural history interview. From 581 participants originally admitted to the Civil Addict Program from 1962 through 1964, a cohort of 471 male heroin-dependent individuals was chosen for the study. The Civil Addict Program, established in 1961 by California legislation, was a compulsory drug treatment program for heroin-dependent criminal offenders committed under court

order. As a result, 387 reported an episode of opioid abstinence lasting at least one month during study follow up; the mean duration of follow-up for the sample was 33.1 years. Furthermore, durations of heroin abstinence among individuals with multiple episodes were successively longer in following attempts. Drug Abuse Treatment Outcome Study participants who had recovered at follow-up reported that they had relied primarily on personal motivation, treatment experiences, religion/spiritually, family, and their jobs.

A study by Evans et al. (2015) examined the rate of mortality among more than 32,000 individuals enrolled in publicly-funded pharmacology treatment for opioid dependence in California from 2006 to 2010. There were more than 1,000 deaths over the 5-year follow up. Treatment is a critical factor that can reduce mortality risk in an opioid dependent population. Methadone maintenance treatment (MMT), which usually takes an average of 12 or more month, is the most effective and widely-used therapeutic intervention for heroin dependence. In addition to relief of withdrawal symptoms, other benefits of continued MMT engagement include decreased HIV risk behaviors, lowered risk for hepatitis C, reduced crime rates and improved mental health-related quality of life. Opioid detoxification is a common, but controversial therapy that usually involves using medications, such as methadone and naltrexone, to relieve withdrawal-related discomfort. Study findings demonstrate that individuals who were treated for opioid dependence had a four-fold increase in mortality risk compared with the general population (Evans et al., 2015). Detoxification and methadone maintenance treatment both independently reduced drug-related mortality.

Nyamathi et al. (2009) examined data from a longitudinal trial among moderate and heavy alcohol users, aged 18-55 years, receiving methadone maintenance therapy

(MMT) from five large methadone maintenance clinics in the Los Angeles area. The participants completed a baseline interview, administered by trained research staff one-on-one, prior to randomization into one of three programs: Motivational-Single group, Motivational-Group, or Health Promotion. Data collection occurred between February 2007 to May 2008. Alcohol use was assessed by the question: “During the last six months, how many drinks did you consume on a typical day?” Heavy drinking was defined as consumption of five or more drinks per day on an average day, and moderate drinking was defined as less than five drinks per day on an average day. All participants were moderate or heavy drinkers. Drug use was assessed as the sum of the number of days that heroin, other opiates, cocaine, marijuana, barbiturates, hallucinogens, and/or amphetamines were used in the last 30 days. Participants who were found to be in the upper median score were considered to be heavy drug users. The majority of the participants were age 50 or older, almost all were male, and all were enrolled in MMT for six months or longer. Approximately one third were Hispanic, one third were African-American, and nearly one quarter were White. No differences were found between moderate and heavy alcohol drinkers with regard to age, sex, education, source of social support or wanting treatment. These findings suggest that MMT programs should target vulnerable clients of all ages and provide health screenings for those who are treated for narcotic addiction and alcohol use.

Primary care practitioners (PCPs) are the largest group of opioid prescribers in the United States, and safety-net settings care for low income patients. Patients with a history of substance use are more likely to misuse or overdose on opioid medications for chronic noncancer pain (CNCP) than those without a history of substance use. A study by

Hurstak et al. (2017) conducted semi-structured interviews with 23 PCPs and 46 of their patients who had a history of CNCP and substance use. The study was conducted at six health care settings in the San Francisco Bay Area between October 2013 and March 2014. The researchers found that patients with substance use are more likely to be prescribed opioid therapy and several times more likely to experience opioid misuse, leading to opioid overdose and/or death. To collect their data, they used a sampling approach in clinics serving safety-net patient populations where clinicians had experience treating patients with CNCP and substance use and provided gift cards to those patients for their participation. Four out of 50 patients declined to participate. 61 percent of the patients identified as African-American, 54 percent were female, and the rest were White and Latino. The findings suggest that clinicians and their patients do not share an understanding of opioid risk. In order to improve the informed consent process for opioid therapy, patients and clinicians need to share an understanding of opioid risks and be able to discuss risks and benefits without harming the patient-clinician relationship.

Section 5: Findings/Analysis

So, should not we just stop prescribing opioids? The answer is no. The opioid crisis is not easy to tackle. The crisis was spurred by a broad expansion of medical use to treat chronic pain, leading to high rates of opioid addiction. However, enhancing prescription drug monitoring programs and mandatory health care provider by educating patients on the danger of opioids can help alleviate the severity of the epidemic. The peer-reviewed scholarly articles reviewed are unique in that the methods used include surveys, data charts or tables, and basic medical examinations. Data on demographic characteristics, such as, race/ethnicity, age, sexual orientation, and socioeconomic status, were also collected.

One major finding from this literature review is that rural areas and low-income communities have a higher risk of poor outcomes. Areas in San Francisco are facing the serious public threat of outbreaks of counterfeit medications. Providing access to healthcare and counterfeit medication monitoring by physicians can help accommodate those individuals.

Younger individuals who “doctor shop” have higher rates than those who are over 65 years of age. In addition, the use of multiple prescribers is most common among young females and high school dropouts. Real-time databases like CURES can be used to collect and monitor individuals who use multiple prescribers, especially the younger age cohort.

In San Francisco, deaths from highly potent prescription opioid overdose appear to be highest among middle-aged non-Hispanic white males. By contrast, another study in South Los Angeles showed that African-Americans over the age of 65 have a large

number of participants who are at high-risk for under assessment and pain treatment. As such, African-American over the age of 65 appear to be one of the most vulnerable groups in need of improved access to healthcare.

Recommendations

Policymakers should take barriers to combating the opioid crisis into consideration. One of the common barriers that this literature review touches upon is access to health care -- one reason that some opioid overdose patients cannot obtain treatment.

What can be done? There is no silver bullet to this question. Experts agree that fixing the opioid epidemic will take a combination of solutions. But which approaches will be most effective and efficient?

On October 26, 2017, President Trump announced that his Administration was declaring the opioid crisis a national Public Health Emergency under federal law, effective immediately. The White House fact sheets website quoted: “The best way to prevent drug addiction and overdose is to prevent people from abusing drugs in the first place. If they don’t start, they won’t have a problem” (White House, 2017). President Trump’s opioid initiative calls for expanded access to telemedicine services, including services involving remote prescribing of medicine commonly used for substance abuse or mental health treatment, overcoming bureaucratic delays and inefficiencies in the hiring process by providing specialists with the tools needed, and providing resources to help people who are eligible to receive substance abuse treatment.

Prevention for States is a program that helps states combat the ongoing prescription drug overdose epidemic by providing state health departments with the

resources and support needed to advance interventions for preventing prescription drug overdoses (CDC, 2017). The CDC funds 29 states, including California, through this program. States' activities include maximizing Prescription Drug Monitor Programs (PDMP): moving toward universal registration and use, making PDMP easier to use and access, making PDMP data timelier, expanding and improving proactive PDMP reporting to identify and address inappropriate prescribing patterns, and using PDMP data to better understand the nature of the prescription drug overdose epidemic (CDC, 2017).

The California Department of Public Health (CDPH) has joined forces with the Statewide Opioid Safety (SOS) Workgroup in developing opioid resource tools for providers who see patients and medical guidance to write prescriptions for pain management. The State of California is leveraging a multi-sector collaboration at both the state and local levels to build a comprehensive approach to address the opioid epidemic. The statewide overarching strategy include five main components: 1) safe prescribing; 2) access to treatment; 3) naloxone distribution; 4) public education campaign; and 5) data-driven interventions. Naloxone is a medication that can be rapidly administered through intramuscular injection or nasal spray and works almost immediately to reverse opiate overdose. Naloxone is currently a prescription drug, but is not a controlled substance. Senate Bill (SB) 833 (Chapter 30, Statutes of 2016) established a new Naloxone Grant Program within the CDPH with the goal of reducing the number of fatal overdoses in California from opioid drugs by increasing access to the life-saving drug naloxone (CDPH, 2018).

Community, insurer or health systems interventions include providing technical assistance to high-burden communities and counties, improving opioid prescribing

interventions for insurers and health systems, and enhancing use of evidence-based opioid prescribing guidelines.

Prescribers should be aware of these guidelines before prescribing opioid medications and evaluate the risk factors for opioid-related harms. On March 19, 2018, President Trump announced his plans to confront the driving forces behind the opioid crisis, stating: “We will work to strength vulnerable families and communities, and we will help to build and grow a stronger, healthier, and drug-free society.” President Trump’s Initiative to Stop Opioid Abuse calls for addressing factors fueling the opioid crisis, including over-prescription, illicit drug supplies, and insufficient access to evidence-based treatment, primary prevention, and recovery support services. It also plans to reduce drug demand through education, awareness, and preventing over-prescription, cut off the flow of illicit drugs across our borders and within communities, and save lives by expanding opportunities for proven treatments for opioid and other drug addictions (White House, 2018). Retail pharmacies like Walmart will implement new opioid prescription limits by the end of summer 2018. Starting January 1, 2020, Walmart will require that all controlled-substance prescriptions be submitted electronically. According to Walmart, “E-prescriptions are proven to be less prone to errors, they cannot be altered or copied and are electronically trackable” (Romo, 2018).

Clinicians, patient, and pharmacists can all play a role in identifying nonmedical use of prescription opioids and preventing drug misuse.

- Clinicians – as mentioned in literature review article above, primary care physicians (PCP) are the largest group of opioid prescribers. By asking about all drugs, physicians can help their patients recognize that a problem

exists, provide or refer them to appropriate treatment, and set recovery goals. Doctors should also take note of rapid increases in the amount of medication needed or frequent, unscheduled refill requests. Preventing or stopping nonmedical use of prescription drugs is an important part of their patient care (National Institute on Drug Abuse, 2018).

- Patient – can take steps to ensure that they use prescription medications appropriately by: following the directions as explained on the label or by the pharmacist; being aware of potential interactions with other drugs as well as alcohol; never stopping or changing a dosing regimen without first discussing it with the doctor; never using another person’s prescription, and never giving their prescription medications to others; and storing prescription stimulants, sedatives, and opioids safely (National Institute on Drug Abuse, 2018). Patients should properly discard unused or expired medications, such as medicine take-back options, proper disposal in the household trash, and flushing certain potentially dangerous medicines in the toilet (Food and Drug Administration, 2018).
- Pharmacists – can help patients understand instructions for taking their medications. In addition, by being watchful for prescription falsifications or alterations, pharmacist can serve as the first line of defense in recognizing problematic patterns in prescription drug use (National Institute on Drug Abuse, 2018). Pharmacist can alert other pharmacists in the other region when they detect fraudulent prescription. Also,

pharmacists have access to real-life database like CURES to help track opioid-prescribing patterns.

Conclusion

The findings from this project underscore the underlying issues of access to health care with racial/ethnic minorities groups, sexual groups, and socioeconomic status. The opioid crisis will continue to be a problem throughout California, but actions of state-level health care leader or political leaders, payers/insurers, treatments and solutions can help alleviate the crisis. State-level prescription drug monitoring programs and mandating that health care providers educate patients on the dangers of opioids are highly recommended to address the opioid crisis in California.

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Appendix: Conceptual Models

