Public Health Reports

How States Are Tackling the Opioid Crisis

Public Health Reports
2017, Vol. 132(2) 171-179

DOI: 10.1177/0033354916688206
journals.sagepub.com/home/phr

Shalini Wickramatilake, MHS[1], Julia Zur, PhD[2], Norah Mulvaney-Day, PhD[3], Melinda Campopiano von Klimo, MD[2], Elizabeth Selmi, BA[1], and Henrick Harwood, BA[1]

Abstract

Objectives: We used data from the 2015 National Association of State Alcohol and Drug Abuse Directors Web-based questionnaire and other sources to demonstrate the range and scope of state initiatives being used to deal with the opioid crisis in the United States.

Methods: State alcohol and drug agency directors and designated senior agency managers responded to the questionnaire, which asked respondents about recent opioid-related state-level public health initiatives at their agencies.

Results: State alcohol and drug agencies in all 50 states and the District of Columbia responded, all of which reported that prescription drug misuse was a high priority or the highest priority area for their agencies. Of the 51 respondents, states reported initiatives to educate the general public (n = 48), prescribers (n = 31), patients and families (n = 24), and pharmacists (n = 22) about the risks of opioids. In addition, 29 states had increased funding for medication-assisted treatment of opioid addiction, 28 had expanded the availability of naloxone (an opioid antidote), 26 had established guidelines for safe opioid prescribing, 23 had launched requirements for prescriber use of prescription monitoring programs, 23 had passed Good Samaritan laws to protect those helping treat overdoses, and 14 had enacted legislation to regulate pain clinics.

Conclusions: US state alcohol and drug agencies demonstrated a robust response to the opioid crisis in the United States. They have pursued and expanded on an array of evidence-based initiatives aimed at the opioid crisis. Future public health efforts should focus on maintenance and further expansion of high-quality, evidence-based practices, policies, and programs.

Keywords
opioids, prescription drugs, heroin, addiction, states

In 2015, more than 33 000 people living in the United States died from opioid overdoses. Drug overdose deaths quadrupled from 2000 to 2014, and they exceeded automobile crashes as a cause of death in the United States in 2014.[1] If that is not troubling enough, the National Survey on Drug Use and Health estimated that >10 million people in the United States used prescription opioids for nonmedical use in 2014.[2] This finding is a substantial concern because people who misuse prescription opioid painkillers are 40 times more likely to become addicted to heroin than those who do not misuse prescription opioids,[3] and 80% of new heroin users report previously misusing prescription opioids.[4] The shift from prescription drug misuse to heroin use is attributable to the pharmacologic similarities of the 2 opioids and the affordability and accessibility of heroin.[5]

This worsening of prescription drug misuse has drawn increasing attention at the national and state levels. At the federal level, the US Department of Health and Human Services and the Office of National Drug Control Policy have undertaken various initiatives to address the US opioid crisis. As part of this effort, in 2015 the Department of Health and Human Services developed a 3-pronged initiative focusing on educating providers about safe prescribing of opioids, increasing access to medication-assisted treatment, and raising the use of naloxone.[6] Although efforts at the federal level are important, state alcohol and drug agencies have a long history of providing publicly funded prevention, treatment, and recovery services to address the misuse of and dependence on alcohol and other drugs.[7] Recently, as the toll of

[1] National Association of State Alcohol and Drug Abuse Directors, Washington, DC, USA
[2] Substance Abuse and Mental Health Services Administration, Rockville, MD, USA
[3] Truven Health Analytics, an IBM Company, Cambridge, MA, USA

Corresponding Author:
Shalini Wickramatilake, MHS, National Association of State Alcohol and Drug Abuse Directors, 1919 Pennsylvania Ave NW, Ste M-250, Washington, DC 20006, USA.
Email: swickramatilake@nasadad.org

opioid overdoses has continued to rise in most states, these state agencies have undertaken numerous initiatives to address this issue.[8] However, to our knowledge, these state efforts have been neither collectively quantified nor summarized.

Our objective was to use data from the 2015 National Association of State Alcohol and Drug Abuse Directors Web-based questionnaire and other sources to demonstrate the range and scope of state initiatives, programs, and strategies being used to deal with the escalating opioid crisis in the United States.

Methods

We collected information about state-level initiatives and other state responses to the opioid crisis using a Web-based questionnaire, review of pertinent public health literature, and informal discussions with state alcohol and drug agencies throughout the United States.

Web-Based Questionnaire

In May 2015, the National Association of State Alcohol and Drug Abuse Directors, an organization whose members include each state's alcohol and drug agency, introduced a Web-based questionnaire to the directors of these agencies. Agencies received an initial email request to complete the instrument, followed by multiple email reminders. Agencies had the option of submitting a single unified response on behalf of the entire agency or multiple responses from divisions within the agency (eg, prevention division, opioid treatment division).

We received 83 individual responses to the questionnaire, including at least 1 response from each of the 50 states and the District of Columbia. Responses came from state alcohol and drug agency directors and designated senior agency managers (eg, opioid treatment authorities, clinical substance use disorder treatment managers, and substance abuse prevention managers). When different state respondents completed the questionnaire, we compiled the answers into a single state response. If the state agency director was one of the respondents, we used his or her response as the final state response. If the state director did not respond, we contacted all of the state's respondents (the designated senior agency managers) via email or telephone to reconcile any discrepancies and to aid in establishing a single state response. The results reflect only affirmative responses to the questionnaire; we did not include nonresponses or responses of *no* or *unsure*.

The questionnaire asked respondents about their agencies' recent opioid-related state-level public health initiatives, strategies, and action plans (Box). It contained questions designed to yield information about the level of prioritization being given to the opioid crisis; existence of task forces, educational initiatives, opioid-prescribing guidelines, and programs for naloxone training and access; requirements related to Prescription Drug Monitoring Programs (PDMPs) and pain clinic registration; funding of medication-assisted treatment for opioid dependence; efforts to address discrimination associated with substance use disorders; and enactment of any other pertinent legislation. The questionnaire also asked about any other challenges or technical assistance needs experienced by the agencies.

To obtain as much information as possible, the questionnaire used primarily open-ended questions. However, closed-ended questions were used to elicit information about opioid-related legislation and efforts to address discrimination.

Box. Selected questions from the National Association of State Alcohol and Drug Abuse Directors questionnaire, May 2015

- In the past year, has your state agency taken any steps to educate the general public on prescription drug abuse, the shift from prescription drug abuse to heroin abuse, and/or heroin abuse issues?
- Does your state have any current or recent programs or initiatives to prevent prescription drug abuse that are targeted toward adolescents and young adults?
- Does your state have any current or recent programs or initiatives to prevent prescription drug abuse that are targeted toward women?
- Does your state have any current or recent programs or initiatives to prevent prescription drug abuse that are targeted toward older adults?
- Has your state agency taken any steps in the past year to implement educational activities related to prescribing and prescription drugs for the following groups: Physicians and other prescribers? Pharmacists? Patients and families?
- Has your state changed (or is your state planning to change) laws or regulations that govern naloxone administration? If so, please describe the laws or regulations.
- In the past year, has your state expanded financial support for the use of methadone in the treatment of opioid or heroin dependence, either through the state alcohol and drug agency or Medicaid?
- In the past year, has your state expanded financial support for the use of buprenorphine in the treatment of opioid or heroin dependence, either through the state alcohol and drug agency or Medicaid?
- In the past year, has your state expanded financial support for the use of extended-release injectable naltrexone in the treatment of opioid or heroin dependence, either through the state alcohol and drug agency or Medicaid?
- In the past year has your state agency taken any steps or made plans to implement naloxone training and access programs?
- Does your state have legislation requiring opioid prescribers to report to PDMPs [Prescription Drug Monitoring Programs]?
- Has your state enacted laws requiring pain clinics to register with the state?
- Has any agency or professional association in your state issued opioid prescribing guidelines for providers?

Other Sources

In addition to the Web-based questionnaire, we reviewed pertinent public health literature on PubMed, and we obtained information from informal discussions with state agencies. We also gathered information from the National Association of State Alcohol and Drug Abuse Directors' *Overview of State Legislation to Increase Access to Treatment for Opioid Overdose*, a document that discusses laws that states have enacted to increase access to treatment for opioid overdose and, in turn, to reduce fatal opioid overdoses.[9] We used the Web-based questionnaire as the main source of information on state initiatives, but in cases in which the Web-based questionnaire did not capture particular initiatives, we used these other sources to supplement this information. Because this study did not involve any human subjects, institutional review board review was not required.

Results

Of the 51 state agency respondents, 22 reported that prescription drug misuse was the highest priority area for their agencies, and the other 29 reported that it was a high priority but not the highest (Table 1). Of the 51 respondents, 48 noted that their agencies were part of state task forces collaborating with various stakeholders to address prescription drug misuse, and 48 reported that their agencies had undertaken initiatives to provide education about the risks of opioids to the general public. Agencies employed targeted educational initiatives to adolescents and young adults (28 states), women (15 states), and older adults (13 states), and those initiatives involved the use of printed materials, internet campaigns, multimedia presentations, and other methods. Agencies also offered education about prescription practices and the use of prescription opioids to physicians and other prescribers (31 states), patients and families (24 states), and pharmacists (22 states).

Of all agency respondents, 26 reported that their state departments of public health, state medical boards, or state boards of pharmacy had issued opioid-prescribing guidelines for providers, and an additional 8 were currently in the process of developing prescribing guidelines. These guidelines addressed various aspects of opioid use and prescribing, including dosing (17 states), screening for opioid misuse (15 states), urine drug testing to ensure compliance (13 states), provider-patient agreements for opioid use (13 states), patient education resources (12 states), and coordination between emergency department and primary care providers (10 states).

Of the 51 responding agencies, 28 had implemented or made plans to implement naloxone training and access programs, and 25 had expanded financial support for the use of naloxone to reverse opioid overdose. Of these 25 agencies, additional funding came from the state alcohol and drug agency (12 states), the state department of health (11 states), and Medicaid (10 states). Agencies also cited barriers to the distribution of naloxone, including cost (33 states), public resistance or discrimination (15 states), lay administration liability concerns (10 states), third-party prescription prohibition (9 states), and prescriber liability concerns (8 states). Another approach to addressing opioid overdose—the enactment of Good Samaritan laws—had been implemented in 23 states.

Of the 51 agency respondents, 23 noted that their states had legislation requiring opioid prescribers to report to PDMPs. Only 4 of those 23 agencies directly oversaw the PDMP, 4 were part of a larger committee overseeing the PDMP, 14 served in an advisory capacity, and 1 respondent was unsure of the agency's role in the state PDMP. Conversely, 20 agencies were not involved with the state's PDMP, 1 agency had no PDMP in its state, and 2 respondents were unsure of the agency's involvement with the PDMP. In addition, 14 of 51 respondents reported that their states had enacted laws requiring pain clinics to register in some capacity with the state.

Twenty-nine agencies reported expanded financial support in their states in the previous year for medication-assisted treatment, through either Medicaid or the state alcohol and drug agency itself (Table 2). This support included expanded financial support for extended-release injectable naltrexone (12 states), methadone (10 states), and buprenorphine (5 states). Of the 20 states receiving expanded financial support for medication-assisted treatment through Medicaid, 7 states received support for all 3 medications, 6 for methadone and buprenorphine, 3 for buprenorphine and naltrexone, 2 for methadone only, and 2 for buprenorphine only.

Eighteen agencies adopted strategies or initiatives aimed at reducing the stigma associated with opioid use disorder and the discrimination related to the use of medication-assisted treatment. These strategies included assisting with access to recovery support services (14 states), expanding access to a full range of evidence-based therapies (12 states), improving the availability of effective therapies within the criminal justice system (11 states), and training providers in medication-assisted treatment or modifying possibly discriminatory language in communications pertaining to opioid use disorder and medication-assisted treatment (8 states).

Discussion

During the past several years, state alcohol and drug agencies in the United States have placed greater emphasis on tackling the opioid crisis. These agencies have undertaken numerous initiatives to address this issue as the toll of opioid overdoses has continued to rise in most states.[10] However, to our knowledge, the range and scope of interventions implemented at the state level have not been quantified or summarized. Therefore, we collected information from each of the 50 states and the District of Columbia about state-level initiatives and other state responses to the opioid crisis, using various sources.

Table 1. State alcohol and drug agency initiatives to address opioid abuse, by state, based on National Association of State Alcohol and Drug Abuse Directors questionnaire,[a] May 2015

	Education on Risks of Opioids				Education on Prescribing of Opioids[b]								
State	General Population[c]	Adolescents[d]	Women[e]	Older Adults[f]	Physicians and Other Prescribers	Patients and Families	Pharmacists	Good Samaritan Law[g]	Funding for MAT[h]	Access to Naloxone[i]	PDMP Reporting Required[j]	Pain Clinic Regulation[k]	Prescriber Guidelines[l]
AL	✓	✓			✓				✓ M, S			✓	✓
AK													
AZ	✓	✓		✓	✓	✓	✓			✓			✓
AR	✓							✓					✓
CA	✓				✓		✓		✓ M	✓			✓
CO	✓	✓			✓				✓ M, S	✓			✓
CT	✓	✓						✓		✓			✓
DC	✓							✓	✓ M, S				
DE	✓	✓			✓	✓	✓	✓	✓ S	✓	✓		
FL	✓	✓	✓	✓					✓ S	✓	✓	✓	✓
GA	✓	✓				✓		✓	✓ S				
HI	✓							✓			✓		
ID	✓	✓			✓	✓	✓			✓			✓
IL	✓							✓	✓ S	✓	✓		
IN	✓	✓	✓	✓	✓	✓	✓	✓	✓ S	✓	✓	✓	✓
IA	✓				✓	✓	✓						
KS											✓		
KY	✓		✓					✓	✓ M	✓	✓	✓	✓
LA	✓				✓		✓	✓	✓ M, S		✓	✓	
MA	✓		✓	✓									
MD	✓				✓	✓	✓	✓	✓ M, S	✓	✓		
ME	✓	✓			✓	✓					✓		
MI	✓	✓	✓	✓	✓	✓	✓		✓ S				✓
MN	✓				✓	✓		✓		✓			✓
MO	✓				✓	✓			✓ S				
MS	✓	✓			✓		✓	✓		✓		✓	
MT	✓	✓		✓									✓
NC	✓	✓			✓		✓	✓	✓ M		✓		
ND	✓												
NE	✓	✓	✓	✓									
NH	✓	✓						✓	✓ M	✓	✓		✓
NJ	✓	✓	✓		✓	✓		✓	✓ M, S	✓	✓		
NM	✓	✓			✓	✓	✓	✓	✓ M, S	✓			
NV	✓	✓	✓	✓	✓		✓	✓			✓		
NY	✓								✓ M, S	✓	✓		
OH	✓	✓	✓	✓	✓	✓	✓		✓ M	✓	✓	✓	✓
OK	✓				✓	✓			✓ S	✓	✓		✓
OR	✓	✓						✓					✓
PA	✓	✓	✓	✓	✓	✓		✓	✓ M, S	✓	✓		✓

(continued)

Table 1. (continued)

State	Education on Risks of Opioids				Education on Prescribing of Opioids[b]								
	General Population[c]	Adolescents[d]	Women[e]	Older Adults[f]	Physicians and Other Prescribers	Patients and Families	Pharmacists	Good Samaritan Law[g]	Funding for MAT[h]	Access to Naloxone[i]	PDMP Reporting Required[j]	Pain Clinic Regulation[k]	Prescriber Guidelines[l]
RI	✓				✓	✓	✓	✓		✓			✓
SC	✓	✓			✓		✓					✓	✓
SD	✓										✓		✓
TN	✓	✓	✓		✓	✓	✓		✓ S		✓	✓	✓
TX	✓	✓	✓	✓		✓			✓ M	✓		✓	
UT	✓			✓	✓	✓	✓	✓		✓		✓	✓
VA	✓	✓	✓		✓	✓	✓		✓ M	✓			
VT	✓				✓	✓	✓		✓ M, S	✓	✓		✓
WA	✓	✓	✓	✓	✓	✓	✓		✓ M	✓			✓
WI	✓				✓	✓	✓	✓	✓ M	✓	✓	✓	
WV	✓	✓	✓		✓				✓ M	✓	✓	✓	
WY												✓	✓
Total	48	28	15	13	31	24	22	23	29	28	23	14	26

Abbreviations: M, Medicaid; MAT, medication-assisted treatment; PDMP, Prescription Drug Monitoring Program; S, state alcohol and drug agency.

[a]Based on 51 responses from all 50 states and Washington, DC, to a questionnaire about initiatives to address the opioid crisis. A checkmark indicates an affirmative response, and no checkmark indicates no, unsure, or nonresponse.

[b]Based on the question: Has your state agency taken any steps in the past year to implement educational activities related to prescribing and prescription drugs for the following groups: Physicians and other prescribers? Pharmacists? Patients and families?

[c]Based on the question: In the past year, has your state agency taken any steps to educate the general public on prescription drug abuse, the shift from prescription drug abuse to heroin abuse, and/or heroin abuse issues?

[d]Based on the question: Does your state have any current or recent programs or initiatives to prevent prescription drug abuse that are targeted toward adolescents and young adults?

[e]Based on the question: Does your state have any current or recent programs or initiatives to prevent prescription drug abuse that are targeted toward women?

[f]Based on the question: Does your state have any current or recent programs or initiatives to prevent prescription drug abuse that are targeted toward older adults?

[g]Based on the question: Has your state changed (or is your state planning to change) laws or regulations that govern naloxone administration? If so, please describe the laws or regulations. Data on Good Samaritan laws in the states were synthesized with National Association of State Alcohol and Drug Abuse Directors' *Overview of State Legislation to Increase Access to Treatment for Opioid Overdose*.[9]

[h]Based on the question: In the past year, has your state expanded financial support for the use of methadone, buprenorphine, and/or extended-release injectable naltrexone in the treatment of opioid or heroin dependence, either through the state alcohol and drug agency or Medicaid?

[i]Based on the question: In the past year has your state agency taken any steps or made plans to implement naloxone training and access programs?

[j]Based on the question: Does your state have legislation requiring opioid prescribers to report to PDMPs?

[k]Based on the question: Has your state enacted laws requiring pain clinics to register with the state?

[l]Based on the question: Has any agency or professional association in your state issued opioid prescribing guidelines for providers?

Table 2. States with expanded financial support in the past year for medication-assisted opioid treatment through Medicaid or the state alcohol and drug agency, by medication, based on National Association of State Alcohol and Drug Abuse Directors questionnaire, 2014-2015[a]

State	Methadone	Buprenorphine	Extended-Release Injectable Naltrexone
Alabama	✓ M, S		
California		✓ M	
Colorado	✓ M	✓ M	✓ M, S
Delaware	✓ S	✓ S	✓ S
District of Columbia	✓ M, S	✓ M	
Florida			✓ S
Georgia	✓ S		
Illinois	✓ S		✓ S
Indiana	✓ S		
Kentucky		✓ M	✓ M
Louisiana	✓ M, S		
Maryland	✓ M, S	✓ M, S	✓ M, S
Michigan			✓ S
Missouri			✓ S
New Hampshire	✓ M	✓ M, S	✓ M
New Jersey	✓ M	✓ M	✓ S
New Mexico	✓ M	✓ M	✓ S
New York		✓ M	✓ S
North Carolina	✓ M	✓ M	
Ohio	✓ M	✓ M	✓ M
Oklahoma	✓ S	✓ S	✓ S
Pennsylvania		✓ M, S	✓ M, S
Tennessee			✓ S
Texas	✓ M	✓ M	✓ M
Vermont	✓ M, S	✓ M, S	✓ M
Virginia	✓ M	✓ M	
Washington	✓ M	✓ M	
West Virginia		✓ M	✓ M
Wisconsin	✓ M	✓ M	✓ M

Abbreviations: M, Medicaid; S, state alcohol and drug agency.
[a]Data were based on responses to the following questions: (1) In the past year, has your state expanded financial support for the use of methadone in the treatment of opioid or heroin dependence, either through the state alcohol and drug agency or Medicaid? (2) In the past year, has your state expanded financial support for the use of buprenorphine in the treatment of opioid or heroin dependence, either through the state alcohol and drug agency or Medicaid? and (3) In the past year, has your state expanded financial support for the use of extended-release injectable naltrexone in the treatment of opioid or heroin dependence, either through the state alcohol and drug agency or Medicaid? Based on 51 responses from all 50 states and Washington, DC, to a questionnaire about initiatives to address the opioid crisis. Blank cells indicate no, unsure, or nonresponse.

Intervention Models

From the results of the questionnaire and our informal discussions with state alcohol and drug agencies, we identified the extent to which these agencies have responded to the opioid crisis and the initiatives that states have enacted. In our subsequent review of the pertinent public health literature, we found a number of opioid crisis intervention models that have been evaluated, many of which tie in directly with what these state agencies have reported.

Public Education. Educating the general public and patients about the risks of addiction may be effective at preventing substance misuse and dependence.[11] Research has shown that people who perceive drugs as harmful are much less likely to misuse them than those who do not perceive drugs as harmful.[12] Educational interventions have been directed at a variety of targets. Although some interventions have addressed the general public, others have focused on special populations, such as women, adolescents, and older adults, because these groups have higher biopsychosocial risks for opioid use disorders.[13-18] Similarly, respondents to the questionnaire used in our study focused educational initiatives on adolescents and young adults (28 states), women (15 states), and older adults (13 states).

Provider Education and Guidelines. Efforts directed at prescribers have included the development of educational programs about and guidelines for opioid prescribing.[19] One study found that educating primary care providers on safer opioid prescribing, in conjunction with other community efforts, correlated with a decrease in the proportion of overdose deaths of people with opioid prescriptions from physicians.[20] Existing guidelines for providers have varied in their scope and recommendations, and primary care providers have reported being insufficiently trained in prescribing opioid pain relievers. In response, the Centers for Disease Control and Prevention published the "CDC Guideline for Prescribing Opioids for Chronic Pain" in 2016 to provide standardized education to health care providers about the safe prescribing of opioids.[21] In our study, two-thirds of agencies reported that their state departments of public health, state medical boards, or state boards of pharmacy had issued or were developing opioid-prescribing guidelines for providers.

Naloxone Training and Access. Naloxone is a US Food and Drug Administration–approved medication that is safe and effective at reversing overdose from opioids.[22] Making naloxone available for bystanders and first responders, as well as in emergency departments, can save lives.[23-25] One study in Massachusetts found that among those communities that implemented community overdose education and nasal naloxone distribution programs, 2912 potential bystanders were trained, and 327 successful opioid overdose reversals were reported.[26] However, the cost of naloxone has been cited as a barrier to its access in many communities and states.[27] In our study, more than half of state agencies had implemented or were making plans to implement naloxone training and access programs as well as to provide expanded financial support for the use of naloxone. Yet, aside from cost, our study identified other ongoing barriers to the use of naloxone, including public resistance or discrimination, lay

administration and prescriber liability concerns, and third-party prescription prohibition.

Prescription Drug Monitoring Programs. The first PDMP was established in 1939; as of December 2016, PDMPs were operational in 49 states, and the District of Columbia had enacted PDMP legislation but not yet operationalized the program.[28-30] PDMPs collect, monitor, and analyze electronically transmitted data on prescribing and dispensing as submitted by pharmacies and dispensing providers. They help prescribers identify whether or not their patients are ''doctor shopping'' (ie, visiting different physicians to obtain multiple opioid prescriptions).[31-33] One study found that emergency physicians in Ohio changed their prescribing decisions in 41% of cases after accessing the state's PDMP, with 61% of those changes resulting in no prescribed opioids for the patient.[34] However, more research must be conducted on the effectiveness of PDMPs, because a study conducted between 1999 and 2005 found no significant difference in rates of drug overdose and opioid consumption between states with and without PDMPs.[35] Although almost every state has a PDMP, in our study only about half of states reported that legislation had been passed requiring opioid prescribers or dispensers to report to PDMPs. Additionally, we found that alcohol and drug agencies rarely oversaw these programs.

Medication-Assisted Treatment. The most common medications used to treat opioid addiction are methadone, buprenorphine, and extended-release injectable naltrexone. Use of these medications in conjunction with counseling has been shown to be effective in treating opioid dependence,[19,36,37] with long-term maintenance on these medications providing the highest rates of sustained abstinence.[38,39] More than half of respondents to the questionnaire reported expanded financial support in their states for medication-assisted treatment during the previous year. Yet, only about one-third of respondents reported initiatives aimed at reducing the stigma associated with opioid use disorder or the discrimination related to the use of medication-assisted treatment. Discrimination against people receiving medication-assisted treatment for an opioid use disorder has been well documented, perhaps related to the notion that medication-assisted treatment merely replaces one drug addiction with another.[40]

Laws and Regulations. Pain clinics and ''pill mills'' are one source of opioid overprescribing, and it is likely that overprescribing contributes to the growing prevalence of overdoses. Evidence exists that new or expanded laws and regulations can deter some of this overprescribing. In 2010 in Florida, enactment of laws and regulations pertaining to pain clinics and providers was followed by a 16.7% decrease in the number of drug overdose deaths in the subsequent 2 years.[41] These laws in Florida mandated registration of all pain clinics, established a state PDMP, and prohibited physicians from dispensing Schedule II and III drugs directly from their offices. In our study, however, only about one-third of states had enacted laws requiring pain clinics to register with the state, and we did not obtain much additional information about the frequency or types of other legislation being implemented in the states. One exception to that lack of information about legislation is Good Samaritan laws, which have been enacted to improve the availability of medical assistance during an overdose. Good Samaritan laws provide criminal immunity for victims and witnesses who act in good faith to seek or give medical assistance when they believe an overdose is occurring. Almost half of the states in our study reported implementation of a Good Samaritan law, and although these laws are becoming more common, their impact in reducing overdose deaths has not yet been fully evaluated.[42,43]

The consequences of the current opioid epidemic have been catastrophic, which has motivated state alcohol and drug agencies to prioritize the prevention and treatment of opioid addiction. To make matters worse, experts tracking the epidemic have reported that some opioid users are now beginning to transition from prescription opioids to heroin, which often is cheaper and more accessible.[10] State agencies have implemented educational programs for the general public and for high-risk groups, based on evidence that those who perceive drugs as harmful are much less likely to misuse them than those who do not perceive drug use as risky.[12] They have pursued programs to generate opioid-prescribing guidelines and to educate health care providers on safer opioid-prescribing practices, based on reports that such prescriber education may reduce opioid overdoses.[20] They have implemented initiatives to distribute naloxone overdose reversal kits to police and other first responders, as well as to patients, families, and other community members, a strategy with a strong evidence base.[23-25] They have expanded funding for and made efforts to address the stigma surrounding medication-assisted treatment, another evidence-based strategy in the fight against opioid abuse.[19,20,36,37] However, at the present time, little evidence is available concerning the effectiveness of other state policies and practices, such as the mandatory use of PDMPs and punitive actions for patients who ''doctor shop.'' Additional studies of these and other initiatives, policies, and legislation would be beneficial in guiding public health decisions in the future.

Limitations

Our study had several limitations. First, we relied primarily on self-reported data, which are subject to a number of biases. Second, we focused on state efforts only from the perspectives of their alcohol and drug agencies. Although these agencies typically have the primary responsibilities with respect to substance use disorder prevention and treatment, the task of addressing the opioid epidemic has actually been distributed across various agencies and stakeholders,

including public health departments, mental health agencies, medical and pharmacy boards, and law enforcement agencies. In addition, the questionnaire was not designed to be comprehensive; as such, questions about some types of opioid use disorder prevention and treatment strategies (eg, drug takeback initiatives, mandatory drug testing) were not included. Future research into the opioid epidemic should include efforts being spearheaded by other groups—both to shed light on the full scope of initiatives targeting the epidemic and to facilitate better coordination across agencies and stakeholder groups.

Conclusion

As of 2015, the nation's state alcohol and drug agencies have demonstrated a robust response to the opioid addiction crisis in the United States. These agencies have pursued and expanded on an array of evidence-based initiatives and strategies aimed at the opioid crisis, including educating patients, providers, and pharmacists; establishing prescribing guidelines; increasing access to naloxone; providing medication-assisted treatment; and requiring prescribers to use PDMPs. Future public health efforts should focus on the maintenance and further expansion of high-quality evidence-based practices, policies, and programs.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

References

1. Compton WM, Jones CM, Baldwin GT. Relationship between nonmedical prescription-opioid use and heroin use. *N Engl J Med*. 2016;374(2):154-163.
2. Center for Behavioral Health Statistics and Quality. *2014 National Survey on Drug Use and Health: Detailed Tables*. Rockville, MD: Substance Abuse and Mental Health Services Administration; 2015. http://www.samhsa.gov/data/sites/default/files/NSDUH-DetTabs2014/NSDUH-DetTabs2014.pdf. Accessed May 31, 2016.
3. Jones CM, Logan J, Gladden RM, Bohm MK. Vital signs: demographic and substance use trends among heroin users—United States, 2002-2013. *MMWR Morb Mortal Wkly Rep*. 2015; 64(26):719-725.
4. Jones CM. Heroin use and heroin use risk behaviors among nonmedical users of prescription opioid pain relievers—United States, 2002-2004 and 2008-2010. *Drug Alcohol Depend*. 2013;132(1-2):95-100.
5. Muhuri PK, Gfroerer JC, Davies MC; Substance Abuse and Mental Health Services Administration. Associations of nonmedical pain reliever use and initiation of heroin use in the United States. http://www.samhsa.gov/data/sites/default/files/DR006/DR006/nonmedical-pain-reliever-use-2013.htm. Published November 2014. Accessed June 15, 2016.
6. Murthy VH. A promise fulfilled—addressing the nation's opioid crisis collectively. *Public Health Rep*. 2016;131(3): 387-388.
7. Substance Abuse and Mental Health Services Administration. *Funding and Characteristics of Single State Agencies for Substance Abuse Services and State Mental Health Agencies, 2013*. Rockville, MD: Substance Abuse and Mental Health Services Administration; 2015. HHS publication (SMA) 15-4926. http://store.samhsa.gov/shin/content/SMA15-4926/SMA15-4926.pdf. Accessed May 31, 2016.
8. National Association of State Alcohol and Drug Abuse Directors. State substance abuse agencies and prescription drug misuse and abuse: results from a NASADAD membership inquiry. http://nasadad.org/wp-content/uploads/2010/12/NASADAD-Report-SSAs-and-Prescription-Drug-Misuse-and-Abuse-09.2012.pdf&hl=en_US. Published September 2012. Accessed June 14, 2016.
9. National Association of State Alcohol and Drug Abuse Directors. Overview of state legislation to increase access to treatment for opioid overdose. http://nasadad.org/wp-content/uploads/2015/09/Opioid-Overdose-Policy-Brief-2015-Update-FINAL1.pdf. Published September 2015. Accessed May 20, 2016.
10. Rudd RA, Aleshire N, Zibbell JE, Gladden RM. Increases in drug and opioid overdose deaths—United States, 2000-2014. *MMWR Morb Mortal Wkly Rep*. 2016;64(50):1378-1382.
11. Nation M, Crusto C, Wandersman A, et al. What works in prevention: principles of effective prevention programs. *Am Psychol*. 2003;58(6-7):449-456.
12. National Institute on Drug Abuse. Drugs, brains, and behavior: the science of addiction. https://teens.drugabuse.gov/sites/default/files/soa_2014.pdf. NIH publication 14-5605. Published April 2007. Revised 2014. Accessed June 14, 2016.
13. Substance Abuse and Mental Health Services Administration. Finding interventions to prevent or reduce opioid abuse and overdose: selected resources. http://www.samhsa.gov/capt/sites/default/files/resources/interventions-opioid-overdose.pdf. Published 2014. Accessed May 31, 2016.
14. Mack KA, Jones CN, Paulozzi LJ. Vital signs: overdoses of prescription opioid pain relievers and other drugs among women—United States, 1999-2010. *MMWR Morb Mortal Wkly Rep*. 2013;62(26):537-542.
15. Kilpatrick DG, Acierno R, Saunders B, Resnick HS, Best CL, Schnurr PP. Risk factors for adolescent substance abuse and dependence. *J Consult Clin Psychol*. 2000;68(1):19-30.
16. Stagman S, Schwarz SW, Powers D; National Center for Children in Poverty. Adolescent substance use in the US. http://www.nccp.org/publications/pub_1008.html. Published May 2011. Accessed May 31, 2016.
17. Elkington KS, Bauermeister JA, Zimmerman MA. Psychological distress, substance use, and HIV/STI risk behaviors among youth. *J Youth Adolesc*. 2010;39(5):514-527.
18. Substance Abuse and Mental Health Services Administration. *Substance Abuse Among Older Adults*. Rockville, MD: US Department of Health and Human Services; 1998. HHS

publication (SMA) 12-3918. https://www.ncbi.nlm.nih.gov/books/NBK64419/pdf/Bookshelf_NBK64419.pdf. Revised 2012. Accessed June 14, 2016.
19. Kolodny A, Courtwright DT, Hwang CS, et al. The prescription opioid and heroin crisis: a public health approach to an epidemic of addiction. *Annu Rev Public Health*. 2015;36:559-574.
20. Albert S, Brason FW II, Sanford CK, Dasgupta N, Graham J, Lovette B. Project Lazarus: community-based overdose prevention in rural North Carolina. *Pain Med*. 2011;12(suppl 2):S77-S85.
21. Dowell D, Haegerich TM, Chou R. CDC guideline for prescribing opioids for chronic pain—United States, 2016 [published erratum appears in *MMWR Morb Mortal Wkly Rep*. 2016;65(11):295]. *MMWR Recomm Rep*. 2016;65(1):1-49.
22. US Food and Drug Administration. FDA moves quickly to approve easy-to-use nasal spray to treat opioid overdose [news release]. http://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/ucm473505.htm. Published November 18, 2015. Accessed October 14, 2016.
23. Hawk KF, Vaca FE, D'Onofrio G. Reducing fatal opioid overdose: prevention, treatment and harm reduction strategies. *Yale J Biol Med*. 2015;88(3):235-245.
24. Piper TM, Stancliff S, Rudenstine S, et al. Evaluation of a naloxone distribution and administration program in New York City. *Subst Use Misuse*. 2008;43(7):858-870.
25. Maxwell S, Bigg D, Stanczykiewicz K, Carlberg-Racich S. Prescribing naloxone to actively injecting heroin users: a program to reduce heroin overdose deaths. *J Addict Dis*. 2006;25(3):89-96.
26. Walley AY, Xuan Z, Hackman HH, et al. Opioid overdose rates and implementation of overdose education and nasal naloxone distribution in Massachusetts: interrupted time series analysis. *BMJ*. 2013;346:1-12.
27. Wheeler E, Davidson PJ, Jones TS, Irwin KS. Community-based opioid overdose prevention programs providing naloxone—United States, 2010. *MMWR Morb Mortal Wkly Rep*. 2012;61(06):101-105.
28. Centers for Medicare & Medicaid Services. The role of a prescription drug monitoring program in reducing prescription drug diversion, misuse, and abuse. https://www.cms.gov/Medicare-Medicaid-Coordination/Fraud-Prevention/Medicaid-Integrity-Education/Downloads/drugdiversion-drugmonitoring-factsheet.pdf. Published February 2016. Accessed December 6, 2016.
29. National Alliance for Model State Drug Laws. Status of prescription monitoring programs. http://www.namsdl.org/library/55F8ABFD-A368-2686-A5B7E9AAABBC27A0. Published 2016. Accessed May 31, 2016.
30. National Association of State Controlled Substances Authorities. State profiles. http://www.nascsa.org/stateprofiles.htm. Updated 2015. Accessed May 31, 2016.
31. Chakravarthy B, Shah S, Lotfipour S. Prescription drug monitoring programs and other interventions to combat prescription opioid abuse. *West J Emerg Med*. 2012;13(5):422-425.
32. Wixson SE, Blumenschein K, Goodin AJ, Talbert J, Freeman PR. Prescription drug monitoring program utilization in Kentucky community pharmacies. *Pharm Pract (Granada)*. 2015;13(2):540.
33. Reifler LM, Droz D, Bailey JE, et al. Do prescription monitoring programs impact state trends in opioid abuse/misuse? *Pain Med*. 2012;13(3):434-442.
34. Baehren DF, Marco CA, Droz DE, Sinha S, Callan EM, Akpunonu P. A statewide prescription monitoring program affects emergency department prescribing behaviors. *Ann Emerg Med*. 2010;56(1):19-23.
35. Paulozzi LJ, Kilbourne EM, Desai HA. Prescription drug monitoring programs and death rates from drug overdose. *Pain Med*. 2011;12(5):747-754.
36. Kleber HD. Pharmacologic treatments for opioid dependence: detoxification and maintenance options. *Dialogues Clin Neurosci*. 2007;9(4):455-470.
37. Fiellin DA, Friedland GH, Gourevitch MN. Opioid dependence: rationale for and efficacy of existing and new treatments. *Clin Infect Dis*. 2006;43(suppl 4):S173-S177.
38. Bart G. Maintenance medication for opiate addiction: the foundation of recovery. *J Addict Dis*. 2012;31(3):207-225.
39. Krantz MJ, Mehler PS. Treating opioid dependence: growing implications for primary care. *Arch Intern Med*. 2004;164(3):277-288.
40. Substance Abuse and Mental Health Services Administration. *Medication-Assisted Treatment for Opioid Addiction in Opioid Treatment Programs*. Rockville, MD: Substance Abuse and Mental Health Services Administration; 2005. HHS publication (SMA) 12-4214. http://store.samhsa.gov/shin/content//SMA12-4214/SMA12-4214.pdf. Updated 2014. Accessed June 16, 2016.
41. Johnson H, Paulozzi L, Porucznik C, Mack K, Hertner B. Decline in drug overdose deaths after state policy changes—Florida, 2010-2012. *MMWR Morb Mortal Wkly Rep*. 2014;63(26):569-574.
42. Siegler A, Tuazon E, O'Brien BD, Paone D. Unintentional opioid overdose deaths in New York City, 2005-2010: a place-based approach to reduce risk. *Int J Drug Policy*. 2014;25(3):569-574.
43. Banta-Green CJ, Beletsky L, Schoeppe JA, Coffin PO, Kuszler PC. Police officers' and paramedics' experiences with overdose and their knowledge and opinions of Washington State's drug overdose–naloxone–Good Samaritan law. *J Urban Health*. 2013;90(6):1102-1111.