Testimony

Addressing the U.S. Opioid Crisis

Using an Integrated Systems-Based Approach

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Addressing the U.S. Opioid Crisis: Using an Integrated Systems-Based Approach

Testimony of Bradley Stein[1]
The RAND Corporation[2]

Before the Committee on the Judiciary
United States Senate

December 17, 2019

Thank you Chairman Graham, Ranking Member Feinstein, and distinguished members of the committee for allowing me to testify on opportunities to improve the government's response to the opioid crisis. I am a senior physician policy researcher at the RAND Corporation, where I serve as director of the National Institutes of Health (NIH)–funded RAND-University of Southern California Schaeffer Opioid Policy Tools and Information Center. The views I share today are based on work that my RAND colleagues and I are undertaking as part of Opioids Uncharted, an internally funded RAND initiative to map the unexplored consequences of America's opioid crisis, as well as on our NIH-funded work, which examines the effects of different state and federal approaches on the opioid crisis.

In addition to my research, I am a practicing child and adolescent psychiatrist in Western Pennsylvania, one of the regions that has been greatly affected by the opioid crisis. Many of the children I treat are children of the crisis, whose parents, aunts and uncles, and siblings can be counted among its victims. Many of the challenges their families faced are ones with which we are all familiar. A father developing an addiction after being liberally prescribed opioid pain medications for a minor surgical procedure, when three days' worth would have been more appropriate. A grandparent of one of my patients trying desperately to get treatment for her daughter struggling with opioid addiction, only to be placed on waiting lists for weeks for a buprenorphine prescriber or a slot in a methadone clinic.

But confronting the crisis is not just about better pain management or treatment for opioid use disorder. My clinical work opened my eyes to how the opioid crisis involves multiple systems throughout our society. I think of the crisis as an ecosystem. While many of our more

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widely adopted policy levers focus on individuals at highest risk for opioid misuse or opioid use disorder and focus on the role of the health care system, a much broader swath of the population and public systems is affected. These systems interconnect, often in unexpected ways. Understanding broader effects and the potential unintended consequences of opioid-related interventions is essential if we are to confront this crisis successfully.

In this testimony, I would like to emphasize three basic ideas. First, we have made substantial progress on many fronts that have been a focus of policy efforts, including reducing opioid analgesic prescribing and increasing access to effective treatment for opioid use disorder. However, we still have a long way to go, and we must do a better job addressing the unintended consequences of some of our efforts. Second, our focus on relatively narrow targets means we often miss a broader range of consequences, and, as a result, we fail to establish a more holistic approach, which could ensure longer-lasting, broader effects. Third, addressing the opioid crisis with an integrated systems-based approach requires not just changing our thinking but also integrating data sources and improving communication across agencies and systems.

Opioid Prescribing Policy and Access to and Quality of Treatment

I will begin with opioid prescribing policy and treatment for opioid use disorder.

Opioid Prescribing Policy

Over the last decade, we have made great strides in curbing clinically questionable prescribing and availability of opioid analgesics. The number of opioid pain pills prescribed has been declining since 2012, contributing to a much slower rise in fatal overdoses from pain pills compared with overdoses from heroin or such illegal synthetic opioids as fentanyl. [3] Multiple efforts have likely contributed to these decreases, including prescription drug monitoring programs that are required to be used by prescribers and pharmacists, clinical guidelines on prescribing opioids for chronic pain, and reformulation of OxyContin to prevent misuse.[4] These efforts must continue, coupled with increased efforts to improve nonopioid and nonpharmacological approaches to pain management more generally.

However, some of these efforts have had unintended consequences. Opioids are an important tool in treating pain, and opioid prescribing—even chronic opioid prescribing—is sometimes

[3] Centers for Disease Control and Prevention, "Prescription Opioids: Prescribing Practices," webpage, last reviewed August 13, 2019; Kaiser Family Foundation, "State Health Facts: Opioid Overdose Deaths by Type of Opioid," webpage, undated.

[4] A. S. B. Bohnert, G. P. Guy, Jr., and J. L. Losby, "Opioid Prescribing in the United States Before and After the Centers for Disease Control and Prevention's 2016 Opioid Guideline," *Annals of Internal Medicine*, Vol. 169, No. 6, September 18, 2018, pp. 367–375; G. M. Franklin, J. Mai, J. Turner, M. Sullivan, T. Wickizer, and D. Fulton-Kehoe, "Bending the Prescription Opioid Dosing and Mortality Curves: Impact of the Washington State Opioid Dosing Guideline," *American Journal of Industrial Medicine*, Vol. 55, No. 4, April 2012, pp. 325–331; B. C. Sun, N. Lupulescu-Mann, C. J. Charlesworth, D. M. Hartung, R. A. Dayo, and John McConnell, "Impact of Hospital 'Best Practice' Mandates on Prescription Opioid Dispensing After an Emergency Department Visit," *Academic Emergency Medicine*, Vol. 24, No. 8, August 2017, pp. 905–913; T. M. Haegerich, C. M. Jones, P. O. Cote, A. Robinson, and L. Ross, "Evidence for State, Community and Systems-Level Prevention Strategies to Address the Opioid Crisis," *Drug and Alcohol Dependence*, November 1, 2019.

appropriate. But, concerned about the potential harms, many physicians now choose not to write new opioid prescriptions at all, a reaction that may not be in the best interests of all patients.[5] We have also fallen short in supporting many patients with chronic pain whose sustained treatment with opioids has enabled them to function in and contribute to society. Some patients on chronic opioid treatment for pain might be tapered off opioids too quickly, and some even find it difficult to be accepted by a new primary care physician when their current one retires.[6] These disruptions in chronic illness care potentially increase the likelihood of worse outcomes, such as emergency department visits and hospitalizations.

We also know that suddenly disrupting the supply of opioid pain medication can have undesirable spillover consequences. A prominent example is the 2010 reformulation of OxyContin. The reformulation was intended to make the drug harder to misuse, but many individuals who had been misusing OxyContin switched to illegal heroin, resulting in a spike in heroin overdoses and a subsequent rapid rise in cases of hepatitis C.[7]

We must pay attention to these unintended consequences and mitigate them—but that should not stop us from sustaining and building on our success in decreasing the availability of opioid pain pills that can be diverted and misused. Many people's first experience misusing opioids is with pain pills, not with heroin or fentanyl, and reducing the number of opioid pain pills available for misuse will reduce the flow of individuals developing opioid use disorder.[8]

In the near term, we should increase use of nonopioid pain management approaches and strive to curb clinically questionable prescribing. A teenager having her wisdom teeth removed should not automatically get an opioid prescription. In the longer term, we need to invest in developing and increasing the availability of effective, nonaddictive approaches to pain management—not just developing new drugs, but also other approaches, such as making physical therapy more accessible.

Pain is one of the most prevalent and disabling conditions in our society. Unfortunately, it is not going away: Chronic pain affects one of five U.S. adults; for one of every 12, it is severe

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[5] W. Zhu, M. E. Chernew, T. B. Sherry, and N. Maestas, "Initial Opioid Prescriptions Among U.S. Commercially Insured Patients, 2012–2017," *New England Journal of Medicine*, Vol. 380, No. 11, March 14, 2019, pp. 1043–1052.

[6] J. J. Fenton, A. L. Agnoli, G. Xing, L. Hang, A. E. Altan, D. J. Tancredi, A. Jerant, and E. Magnan, "Trends and Rapidity of Dose Tapering Among Patients Prescribed Long-Term Opioid Therapy, 2008–2017," *JAMA Network Open*, Vol. 2, No. 11, November 1, 2019; P. A. Lagisetty, N. Healy, C. Garpestad, M. Jannausch, R. Tipirneni, and A. S. B. Bohnert, "Access to Primary Care Clinics for Patients with Chronic Pain Receiving Opioids," *JAMA Network Open*, Vol. 2, No. 7, July 3, 2019.

[7] D. Powell, A. Alpert, and R. L. Pacula, "A Transitioning Epidemic: How the Opioid Crisis Is Driving the Rise in Hepatitis C," *Health Affairs*, Vol. 38, No. 2, February 2019, pp. 287–294; A. Alpert, D. Powell, and R. L. Pacula, "Supply-Side Drug Policy in the Presence of Substitutes: Evidence from the Introduction of Abuse-Deterrent Opioids," *American Economic Journal: Economic Policy*, Vol. 10, No. 4, 2018, pp. 1–35.

[8] C. M. Jones, "Heroin Use and Heroin Use Risk Behaviors Among Nonmedical Users of Prescription Opioid Pain Relievers—United States, 2002–2004 and 2008–2010," *Drug and Alcohol Dependence*, Vol. 132, No. 1–2, September 1, 2013, pp. 95–100.

enough to limit their routine activities on most days.[9] As long as the burden of pain remains high, so will the need for effective, nonopioid pain management approaches.

Treatment

If we reduce access to prescription opioids without providing effective treatment for individuals struggling with opioid addiction or dependence, we will trigger unintended consequences as some individuals turn to illicit opioids. Realistically, no matter how successfully we reduce access to opioid pain pills that can be misused and curb illicit opioids that can be purchased on our streets, some individuals will develop an opioid use disorder. Because opioid use disorder is a chronic, relapsing disorder, many of them will require lifelong treatment.

Patients who receive longer-term treatment with safe and effective medications for opioid use disorder, such as methadone, buprenorphine, and extended-release naltrexone, have better treatment outcomes.[10] We have made progress in improving access to medication treatment for opioid use disorder, as well as in the quality of such treatment. Significant effort has been devoted to increasing the number of clinicians who complete the brief training that provides a DEA waiver that allows them to prescribe buprenorphine. The Comprehensive Addiction and Recovery Act expanded the pool of potential prescribers by enabling nurse practitioners (NPs) and physician assistants (PAs) to receive buprenorphine waivers. The surge of NPs and PAs obtaining waivers is increasing the availability of effective treatment in many rural communities that have severe shortages of physicians.[11] In many cases, these are the same communities hard hit by the opioid crisis.

Training clinicians to prescribe buprenorphine is an important first step, as is expanding the workforce in the specialty substance use disorder treatment system. However, federal investments, such as resources provided by the 21st Century Cures State Targeted Response grants and through Medicaid, are essential to further expand access to effective treatment. These investments can support network development, linking buprenorphine-prescribing primary care providers and providers in specialty substance-use disorder treatment clinics. These specialty clinics can offer primary care providers clinical support, consultation, and an option to promptly refer patients who require greater clinical expertise. These networking approaches, first used on a wide scale in Vermont, are now being implemented in a number of states.[12] Increasing federal

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[9] J. Dahlhamer, J. Lucas, C. Zelaya, R. Nahin, S. Mackey, L. DeBar, R. Kerns, M. Von Korff, L. Porter, and C. Helmick, "Prevalence of Chronic Pain and High-Impact Chronic Pain Among Adults—United States, 2016," *Morbidity and Mortality Weekly Report*, Vol. 67, No. 36, September 14, 2018, pp. 1001–1006.

[10] National Academies of Sciences Engineering and Medicine, *Medications for Opioid Use Disorder Save Lives*, Washington, D.C.: The National Academies Press, 2019.

[11] M. L. Barnett, D. Lee, and R. G. Frank, "In Rural Areas, Buprenorphine Waiver Adoption Since 2017 Driven by Nurse Practitioners and Physician Assistants," *Health Affairs*, Vol. 38, No. 12, December 2019, pp. 2048–2056.

[12] J. R. Brooklyn and S. C. Sigmon, "Vermont Hub-And-Spoke Model of Care for Opioid Use Disorder: Development, Implementation, and Impact," *Journal of Addiction Medicine*, Vol. 11, No. 4, July–August 2017, pp. 286–292; G. M. Miele, L. Caton, T. E. Freese, M. McGovern, K. Darfler, V. P. Antonini, M. Perez, and R. Rawson, "Implementation of the Hub and Spoke Model for Opioid Use Disorders in California: Rationale, Design and Anticipated Impact," *Journal of Substance Abuse Treatment*, Vol. 108, 2020, pp. 20–25; MaineHealth,

investments in such approaches appears to be one of the most promising ways to substantially expand access to effective treatment for opioid use disorder.[13]

Thanks to these and other efforts, more individuals who need treatment are getting it. Nevertheless, more than 70 percent of the over 2 million Americans struggling with opioid addiction are not getting treatment.[14] Those who do find treatment might have called multiple providers before finding one willing to treat them, or they might have spent weeks on waiting lists. Only one quarter of adults and fewer than 1 in 50 teens in specialty treatment have received medications like methadone and buprenorphine, which can cut rates of fatal overdoses in half.[15]

There are several steps we can take to narrow this gap. Our medical education system can play an important role. Many training programs have increased the amount of time devoted to training medical residents to treat addiction, many residency programs are now routinely training their residents to prescribe buprenorphine, and some medical schools are providing buprenorphine training to their students. We can expand such efforts. For example, all primary care and emergency department training programs could devote one day of their multiyear programs to train their over 15,000 residents to prescribe buprenorphine.[16] Such targeted training could alleviate the stigma associated with treating individuals for substance use disorder. In just three years, this single change would increase the number of physicians who have been waivered to prescribe buprenorphine by over 50 percent.[17]

But we must to do more. Because of the stigma against illict drug use and our historical approach to treating substance use disorders, many individuals seeking treatment confront unnecessary barriers or attend clinics that use ineffective approaches. Buprenorphine and methadone are the gold-standard treatment for opioid use disorder, but prior authorization is still often required for these lifesaving medications, and abstinence-only clinics, which require a patient to stop these medications before they can participate in counseling or therapy, still exist.[18]

"Implementing a Hub and Spoke Treatment Model in Our Communities," webpage, undated; Washington State Health Care Authority, "Washington State Hub and Spoke Project," webpage, 2019.

[13] R. Rawson, S. J. Cousins, M. McCann, R. Pearce, and A. Van Donsel, "Assessment of Medication for Opioid Use Disorder as Delivered Within the Vermont Hub and Spoke System," *Journal of Substance Abuse Treatment*, Vol. 97, February 2019, pp. 84–90; C. M. Shea, A. K. Gertner, and S. L. Green, "Barriers and Perceived Usefulness of an Echo Intervention for Office-Based Buprenorphine Treatment for Opioid Use Disorder in North Carolina: A Qualitative Study," *Substance Abuse*, December 6, 2019, pp. 1–11.

[14] Center for Behavioral Health Statistics and Quality, *2017 National Survey on Drug Use And Health: Detailed Tables*, Rockville, Md,: Substance Abuse and Mental Health Services Administration, 2018.

[15] K. A. Feder, N. Krawczyk, and B. Saloner, "Medication-Assisted Treatment for Adolescents in Specialty Treatment for Opioid Use Disorder," *Journal of Adolescent Health*, Vol. 60, No. 6, June 2017, pp. 747–750; M. R. Larochelle, D. Bernson, T. Land, T. J. Stopka, N. Wang, Z. Xuan, S. M. Bagley, J. M. Liebschutz, and A,. Y. Walley, "Medication for Opioid Use Disorder After Nonfatal Opioid Overdose and Association with Mortality: A Cohort Study," *Annals of Internal Medicine*, Vol. 169, No. 3, August 7, 2018, pp. 137–145.

[16] National Resident Matching Program, "2017 NRMP Main Residency Match the Largest Match on Record," webpage, March 17, 2017.

[17] Substance Abuse and Mental Health Services Administration, "Practitioner and Program Data," webpage, undated.

[18] D. M. Hartung, K. Johnston, J. Geddes, G. Leichtling, K. C. Priest, and P. T. Korthuis, "Buprenorphine Coverage in the Medicare Part D Program for 2007 to 2018," *JAMA*, Vol. 321, No. 6, February 12, 2019, pp. 607–609.

Banning prior authorizations for buprenorphine and methadone would remove one important barrier to treatment, as would ensuring that no health care organization receiving public dollars could require an individual to discontinue an effective treatment for opioid use disorder before receiving care. Can you imagine telling individuals with diabetes that they needed to stop their insulin before participating in a weight-loss program?

It is especially important to expand access to treatment among groups at highest risk for opioid use disorder and overdose, such as individuals in the criminal justice system. Approximately half of incarcerated individuals have a substance use disorder. Incarcerated individuals have 12 times the risk of death in the first two weeks after release, and fatal overdoses are the most common cause of those deaths.[19] For those recently released from incarceration, seeking help in an already overwhelmed treatment system is particularly challenging. Initiating medication treatment for opioid use disorder before release can help, as can connecting newly released prisoners to treatment programs in their communities.[20] Although offering medication treatment to inmates is not yet widespread, such effective interventions are now routine in some places such as Rhode Island, and communities around the country are trying different ways to treat incarcerated individuals either before or just after they are released.[21] Such approaches have been shown to decrease risk of overdose, crime, and other harms.[22] The NIH has recently launched a national study to learn which of these approaches are most effective and how to improve them.

Criminal justice agencies are also responding before arrest, sentencing, and incarceration. Prearrest diversion strategies, such as Law Enforcement Assisted Diversion (LEAD) and the Police Assisted Addiction and Recovery Initiative (PAARI) are being adopted in communities nationwide.[23] These strategies aim to connect individuals with substance use disorders to community-based treatment and deflect them from the justice system.. Preliminary studies

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[19] I. A. Binswanger, M. F. Stern, R. A. Deyo, P. J. Heagerty, A. Cheadle, J. G. Elmore, and T. D. Koepsell, "Release From Prison—A High Risk of Death for Former Inmates," *New England Journal of Medicine*, Vol. 356, No. 2, January 11, 2007, pp. 157–165.

[20] K. E. Moore, W. Roberts, H. H. Reid, K. M. Z. Smith, L. M. S. Oberleitner, and S. A. McKee, "Effectiveness of Medication Assisted Treatment for Opioid Use in Prison and Jail Settings: A Meta-Analysis and Systematic Review," *Journal of Substance Abuse Treatment*, Vol. 99, April 2019, pp. 32–43.

[21] A. Nunn, N. Zaller, S. Dickman, C. Trimbur, A. Nijhawan, and J. D. Rich, "Methadone and Buprenorphine Prescribing and Referral Practices in US Prison Systems: Results from a Nationwide Survey," *Drug and Alcohol Dependence*, Vol. 105, No. 1–2, November 1, 2009, pp. 83–88; C. Vestal, "At Rikers Island, A Legacy of Medication-Assisted Opioid Treatment," *Stateline*, May 23, 2016; T. C. Green, J. Clarke, L. Brinkley-Rubinstein, B. D. L. Marshall, N. Alexander-Scott, R. Boss, and J. D. Rich, "Postincarceration Fatal Overdoses After Implementing Medications for Addiction Treatment in a Statewide Correctional System," *JAMA Psychiatry*, Vol. 75, No. 4, April 1, 2018, pp. 405–407; J. Bronson, J. Stroop, S. Zimmer, and M. Berzofsky, "Drug Use, Dependence, and Abuse Among State Prisoners and Jail Inmates, 2007–2009," Washington, D.C.: U.S. Department of Justice, June 27, 2017.

[22] Moore et al., 2019; D. Hedrich, P. Alves, M. Farrell, H. Stover, L. Moller, and S. Mayet, "The Effectiveness of Opioid Maintenance Treatment in Prison Settings: A Systematic Review," Vol. 107, No. 3, *Addiction*, March 2012, pp. 501–517.

[23] The Police Assisted Addiction and Recovery Initiative (PAARI), homepage, undated; B. Saloner, A. Alvanzo, A. Latimore, J. Sharfstein, S. Sherman, and D. Webster, *Ten Standards of Care: Policing and the Opioid Crisis*, Baltimore, Md.: Johns Hopkins University, 2018.

suggest such approaches may decrease subsequent involvement in the criminal justice system and reduce legal costs, although further research is needed.[24]

Drug courts and family drug courts are increasingly seen as a potential way to connect individuals and families to treatment, potentially diverting some individuals from incarceration. However, the treatment options available to those in such courts can vary widely. It is essential that those entering drug courts receive treatment consistent with current standards of care, including having access to the full range of medication treatments for opioid use disorder.[25]

How Systems Interact in the Opioid Ecosystem

Although successful in many ways, the relative emphasis on policies that focus on opioid prescribing and treatment for substance use disorders obscures the more widely ranging consequences of the opioid crisis. Observing how the many parts of the opioid ecosystem interact—particularly in unexpected ways—has spurred us to broaden our perspective to consider a more multisystems-based approach that can provide innovative solutions. I will draw on examples of systems intended to protect infants and children, provide stable housing, and reduce harms associated with opioid misuse.

Infants and Young Children

Successful efforts to expand treatment for opioid use disorders must include ensuring access to effective treatment for pregnant women. Between 1999 and 2014, the prevalence of opioid use disorder among pregnant women delivering in hospitals rose more than 300 percent.[26] Infants whose mothers use opioids while pregnant are more likely to be born physically dependent on opioids. Ultimately the majority of these infants can thrive, but many of these babies require costly hospitalizations to treat their condition, and some may have developmental issues that require special education services when they reach school age.

In response to this harmful trend, some states have implemented policies punishing women who misused drugs during pregnancy. The punitive policies were presumably intended to deter pregnant women from using illicit drugs and minimize the number of infants with drug withdrawal. However, we found that these policies have the opposite effect.[27] States with punitive policies aimed at pregnant women saw *higher* rates of infants with drug withdrawal

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[24] S. E. Collins, H. S. Lonczak, and S. L. Clifasefi, "Seattle's Law Enforcement Assisted Diversion (Lead): Program Effects on Criminal Justice and Legal System Utilization and Costs," *Journal of Experimental Criminology*, Vol. 15, No. 2, 2019, pp. 201–211.

[25] H. Matusow, S. L. Dickman, J. D. Rich, C. Fong, D. M. Dumont, C. Hardin, D. Marlowe, and A. Rosenblum, "Medication Assisted Treatment in US Drug Courts: Results from a Nationwide Survey of Availability, Barriers And Attitudes," *Journal of Substance Abuse Treatment*, Vol. 44, No. 5, May–June 2013, pp. 473–480.

[26] S. C. Haight, J. Y. Ko, V. T. Tong, M. K. Bohm, and W. M. Callaghan, "Opioid Use Disorder Documented at Delivery Hospitalization—United States, 1999–2014," *Morbidity and Mortality Weekly Report*, Vol. 67, No. 31, August 10, 2018, pp. 845–849.

[27] L. J. Faherty, A. M. Kranz, J. Russell-Fritch, S. W. Patrick, J. Cantor, and B. D. Stein, "Association of Punitive and Reporting State Policies Related to Substance Use in Pregnancy with Rates of Neonatal Abstinence Syndrome," *JAMA Network Open*, Vol. 2, No. 11, November 1, 2019.

after enacting these laws: pregnant women are likely deterred from seeking prenatal care and being identified with substance use disorders. Punitive policies might have seemed logical, but their outcome is both unintended and undesirable, with consequences rippling through many systems.

We must also ensure that our policies do not inadvertently harm the children of individuals who misuse opioids. Today, more than 1 percent of all the babies born in the United States are in foster care—more than half of them because of a parent's substance use. These 50,000 infants who have been removed from their parents are only a small fraction of the children living in the approximately 13 million households where a parent is misusing opioids. The uncertainty many of these children confront is existential. Lacking a safe, stable, and supportive environment in childhood, these children struggle more in school, and they have higher rates of mental health and addiction problems. In fact, these types of adverse childhood experiences are associated with higher rates of chronic medical problems throughout adulthood. Even if we could end the opioid crisis today, its impacts would still be felt for a generation.

In some situations, the parent's addiction, often complicated by mental health issues, is severe enough that children need to be removed for their own safety. But in many cases, parents and children do well in comprehensive family-based treatment programs—specialized programs that enable the family to stay together and often provide substance use disorder treatment, therapy, parenting skills training, life skills training, and job readiness education with the support of professional staff who ensure the safety of children while their parents and families achieve sobriety and recovery.[28]

Historically, welfare system regulations collided with this approach: the system could only pay for a child's care if the child were separated from their parents, but not when a child accompanied a parent to residential treatment. Fortunately, the Comprehensive Addiction and Recovery Act and the Families First Act contain provisions to keep families together while providing effective treatment to parents struggling with addiction. These acts are additional examples of how a multifaceted approach that funds coordination with systems beyond the health care and treatment systems can be fundamental to an effective response.

Housing

Stable housing is another area in which seemingly sensible rules clash with the realities of someone in recovery. Stable housing is often an essential element for successful recovery from addiction, but far too many families and children are homeless due to a parent's struggles with addiction. There are increasing efforts to provide public housing for homeless families, but the majority of these programs require sobriety. Relapse is a common part of opioid use disorder and its treatment, but even a single relapse involving illicit drugs can allow authorities to evict

[28] Wilder Research and Volunteers of America, *Family-Based Residential Treatment: Directory of Residential Substance Use Disorder Treatment Programs for Parents with Children*, St. Paul, Minn.: Anne E. Casey Foundation, March 2019, updated July 2019.

individuals from federally subsidized housing, although public housing authorities have a great deal of discretion regarding such actions.[29]

Many communities are adopting a better approach. Housing First initiatives, which provide housing and case management support before requiring sobriety, have been shown to improve rates of recovery from substance use disorders. RAND colleagues have found that these efforts even save money: For every dollar invested in such a program, taxpayers saved $1.20.[30]

Reducing Injuries and Deaths from Opioid Abuse

In an effort to reduce the harms associated with opioid abuse, recent policies have made naloxone, an Food and Drug Administration–approved medication that can counter opioid overdose, readily available in most states without a prescription from an individual's own physician. The medication is covered by most major insurance plans, and its use among emergency medical service personnel has grown rapidly. Indeed, some individuals carry naloxone, knowing that they could save the life of someone who has overdosed.

However, these good intentions have an unexpected, unwelcome effect: Good Samaritans who carry naloxone might have difficulties in getting life insurance, because insurers review all recently prescribed medications as part of the underwriting process. Recently, an insurer denied coverage to a nurse who had a prescription for naloxone, ostensibly because the insurer assumed that she was misusing opioids. Furthermore, not all pharmacies provide ready access to naloxone. In a recent survey, fewer than one-third of chain pharmacy branches report that they provide the drug, a decision that may reflect the stigma associated with drug use and concern about the clientele that naloxone might bring to the pharmacy.[31]

Another aspect of promoting community health that merits a second look is the supervised consumption site—a place where people who use drugs can consume previously purchased drugs in a sterile environment under medical supervision. Such sites are an important component of Canada's response to opioid-related overdoses and have been implemented in at least ten other countries.[32] Few studies have examined the population-level effects of these interventions; however, thousands of overdoses have been reversed at these sites, and there appears to be little

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[29] M. Curtis, S. Garlington, and L. Schottenfeld, "Alcohol, Drug, and Criminal History Restrictions in Public Housing," *Cityscape: A Journal of Public Policy Development and* Research, Vol. 15, No. 3, 2013, pp. 37–52.

[30] Sarah B. Hunter, Melody Harvey, Brian Briscombe, and Matthew Cefalu, *Evaluation of Housing for Health Permanent Supportive Housing Program*, Santa Monica, Calif.: RAND Corporation, RR-1694-BRC, 2017.

[31] T. Puzantian and J. J. Gasper, "Provision of Naloxone Without a Prescription by California Pharmacists 2 Years After Legislation Implementation," *JAMA*, Vol. 320, No. 18, November 13, 2018, pp. 1933–1934; E. L. Thompson, P. S. S. Rao, C. Hayes, and C. Purtill, "Dispensing Naloxone Without a Prescription: Survey Evaluation of Ohio Pharmacists," *Journal of Pharmacy Practice*, Vol. 32, No. 4, August 2019, pp. 412–421; L. N. Bakhireva, A. Bautista, S. Cano, S. Shrestha, A. M. Bachyrycz, and T. H. Cruz, "Barriers and Facilitators to Dispensing of Intranasal Naloxone By Pharmacists," *Substance Abuse*, Vol. 39, No. 3, 2018, pp. 331–341.

[32] Beau Kilmer, Jirka Taylor, Jonathan P. Caulkins, Pam A. Mueller, Allison J. Ober, Bryce Pardo, Rosanna Smart, Lucy Strang, and Peter Reuter, *Considering Heroin-Assisted Treatment and Supervised Drug Consumption Sites in the United States*, Santa Monica, Calif.: RAND Corporation, RR-2693-RC, 2018; Health Canada, "Supervised Consumption Sites Explained," webpage, 2018.

basis for concern about adverse effects in communities where they operate.[33] Given the magnitude of the crisis, it may be time to examine if such sites can have a positive impact in the hardest-hit U.S. communities.

An Integrated Systems Approach to Address the Opioid Crisis

I will conclude my testimony by suggesting that we need to change the way we think about, and plan to confront, the opioid crisis.

Integrate and Improve Data Use

Over the last two decades, the opioid crisis has evolved in terms of the nature of the drugs being misused, the communities affected, and the tools and approaches that we use to respond. We could react to changes more quickly, and respond more effectively at the community level, if we better understood the ripple effects of the crisis across the ecosystem. Currently, there is insufficient information to guide our actions.

One approach to gathering the requisite information could exploit the fact that individuals and families affected by the crisis often touch multiple systems. Many states are working to improve their use of data with respect to the opioid crisis, and a number of states are seeking to better understand the timing and patterns of interactions between a range of systems and opioid-affected individuals and their families. States are integrating data at the individual level across multiple systems, including child welfare, housing and social services to highlight interconnections, provide new insights, and facilitate better-coordinated, more-effective state and local responses.

In my own state of Pennsylvania, the Opioid Data Dashboard currently aggregates data from multiple systems, including the Departments of Health, Human Services, and Corrections. The information has helped local stakeholders better understand the impact of the crisis on children and families and the incidence of physical illnesses related to illicit opioid use, such as HIV and hepatitis C. State officials attribute some of the 18-percent decrease in overdose deaths to the resulting improvement in cross-agency data sharing.

Other states are using similar approaches. By integrating health care, behavioral health, adult corrections, juvenile justice, and mortality data, Maryland has been able to develop algorithms identifying individuals at greater risk of overdose.[34] In Massachusetts, probably the state with the most sophisticated data system, the linked data currently include information from 16 systems, including opioid-prescribing data from the prescription drug monitoring program; substance abuse and mental health treatment systems; all-payer health insurance claims covering outpatient care, hospitals, and emergency departments; emergency medical services; and jail and prison, drug testing, child welfare, and birth and death records. More data sources continue to be added.

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[33] J. P. Caulkins, B. Pardo, and B. Kilmer, "Supervised Consumption Sites: A Nuanced Assessment of the Causal Evidence," *Addiction*, July 16, 2019.

[34] M. D. Eisenberg, B. Saloner, N. Krawczyk, L. Ferris, K. E. Schneider, B. C. Lyons, and J. P. Weiner, "Use of Opioid Overdose Deaths Reported in One State's Criminal Justice, Hospital, and Prescription Databases to Identify Risk of Opioid Fatalities," *JAMA Internal Medicine*, Vol. 179, No. 7, July 1, 2019, pp. 980–982.

Massachusetts now can better estimate the size of the population with opioid use disorder and these populations' geographic locations, as well as the harms they are experiencing. These estimates allow better and more efficient targeting of resources.[35] Massachusetts has also used these data to identify common "touchpoints" for individuals who subsequently died from a fatal overdose—different parts of systems encountered by the individual in the year before their death. Interventions at these points in the system might create opportunities to intervene with individuals before an overdose.[36]

Improve Resources and Guidance to Build Better Data Systems

Some states might currently lack the resources and expertise to build integrated data systems, but almost all states could use the experiences of Maryland or Massachusetts to begin to develop integrated data systems in a way that generates useful and timely information while also maintain security and privacy. Federal resources and guidance about best practices could enhance the development of these data resources in many states and even facilitate development of regional integrated data sources, such as with prescription drug monitoring programs, to improve regional responses to the crisis.

There are other ways to enhance our currently available information. Over time, we have seen the opioid that is driving overdoses evolve from pain pills to heroin and now to fentanyl and other synthetic opioids. We have also seen increases in other drugs involved with overdoses, such as methamphetamine and cocaine. But overdoses only paint one part of the drug use picture. Data from other systems, such as the criminal justice system, can complement mortality data and enhance our understanding of how illicit drug markets are evolving differently in different communities. This, in turn, can enable better-informed and coordinated responses from the health care, criminal justice, and public health systems.

One example of data use is information from drug seizures and undercover purchases that the Drug Enforcement Administration (DEA) collects and analyzes. These STRIDE/STARLiMS data have been crucial in allowing the DEA, as well as my RAND colleagues and other researchers, to estimate the size of drug markets and assess how they are changing.[37] Because this type of law enforcement information is not uniformly available, some communities might not have timely information about changes in local drug markets. We can help inform local and national responses by ensuring that all communities have comparable information about drug consumption, emerging substances, and other market measures and that law enforcement data are available to authorized researchers.

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[35] J. A. Barocas, L. F. White, J. Wang, A. Y. Walley, M. R. LaRochelle, D. Bernson, T. Land, J. R. Morgan, J. H. Samet, and B. P. Linas, "Estimated Prevalence of Opioid Use Disorder in Massachusetts, 2011–2015: A Capture–Recapture Analysis," *American Journal of Public Health*, Vol. 108, No. 12, 2018, pp. 1675–1681.

[36] M. R. Larochelle, R. Bernstein, D. Bernson, T. Land, T. J. Stopka, A. J. Rose, M. Bharel, J. M. Liebschutz, and A. Y. Walley, "Touchpoints—Opportunities to Predict and Prevent Opioid Overdose: A Cohort Study," *Drug and Alcohol Dependence*, Vol. 204, November 1, 2019.

[37] Bryce Pardo, Jirka Taylor, Jonathan P. Caulkins, Beau Kilmer, Peter Reuter, Bradley D. Stein, *The Future of Fentanyl and Other Synthetic Opioids*, Santa Monica, Calif.: RAND Corporation, RR-3117-RC, 2019.

Historically, we have also had information about illicit drug markets through interviews of arrestees, in most cases complemented by urine drug tests; these were another critical source of information about how drug markets are changing. However, that effort—the Arrestee Drug Abuse Monitoring program—was discontinued six years ago. Reinstating the program, or some version of it, is critical as the opioid crisis evolves. We are seeing substantial increases in overdose deaths involving nonopioids, such as methamphetamine; and to a large extent, the increase in opioid-related deaths is being driven by substantial fentanyl penetration in a number of states east of the Mississippi. Fentanyl is easy to ship, and there is little to prevent it from swiftly penetrating new communities. If fentanyl in states where the drug now has little presence were to increase to the levels seen in hard-hit states, such as New Hampshire and Ohio, opioid overdose deaths would likely rise substantially. But we have not made the investments in the systems we need to quickly detect and measure such changes.

Invest in Novel Approaches to Data Collection

A more novel approach, but one that is getting increasing attention, is wastewater testing, which can provide objective information about a range of substances being used in a community that complements information available from other sources. Although not widely used in the United States, wastewater testing for illicit drugs has now been piloted in more than 70 cities in 28 countries, and detecting a range of opioids including fentanyl is now a routine component of Australia's ongoing National Wastewater Drug Monitoring Program.[38] The technology is still evolving, but, given its potential to enhance rapid detection of shifts in use of opioids and illicit drugs, Congress could consider funding several pilot efforts in communities whose existing infrastructure can support wastewater testing.

Rethink and Realign to Address Uncertainty

We will be grappling with the opioid crisis, in multiple instances of its evolution, for decades to come. We will need to commit substantial, sustained resources to curb it, and that commitment will need to evolve as the crisis evolves. Such efforts might be informed by the Ryan White CARE Act, a multipronged, multiple-year response to another public health crisis that our nation has faced: AIDS.

Some of our investments for the opioid crisis will build on progress we have made in reducing access to opioid pain pills, improving pain management approaches, and improving access to and quality of treatment for individuals with opioid use disorder and other comorbid substance use disorders. But we also need to change our thinking to understand that the opioid crisis is an ecosystem. This full perspective drives the need to better integrate the data we have and fill data gaps that remain. Viewing the crisis as an ecosystem underscores the value of better

[38] Sewage Analysis CORe Group Europe, "Monitoring," webpage, undated; J. W. O'Brien, S. Grant, A. P. W. Banks, R. Bruno, S. Carter, P. M. Choi, A. Covaci, N. D. Crosbie, C. Gartner, W. Hall, G. Jiang, S. Kaserzon, K. P. Kirkbride, F. Y. Lai, R. Mackie, J. Marshall, C. Ort, C. Paxman, J. Prichard, P. Thai, K. V. Thomas, B. Tscharke, and J. F. Mueller, "A National Wastewater Monitoring Program for a Better Understanding of Public Health: A Case Study Using The Australian Census," *Environment International*, Vol. 122, January 2019, pp. 400–411.

communication with systems such as child welfare and housing, where we can modify existing policies to improve the effectiveness of the nation's overall response to the opioid crisis. Realignment can also potentially mitigate the negative unintended consequences that result from focusing on one system at a time.

We must oppose the opioid crisis on multiple fronts, some of which we undoubtedly do not know of yet. Broadening our view of this crisis and examining it in a systems-based way will help us prepare for the challenges ahead.