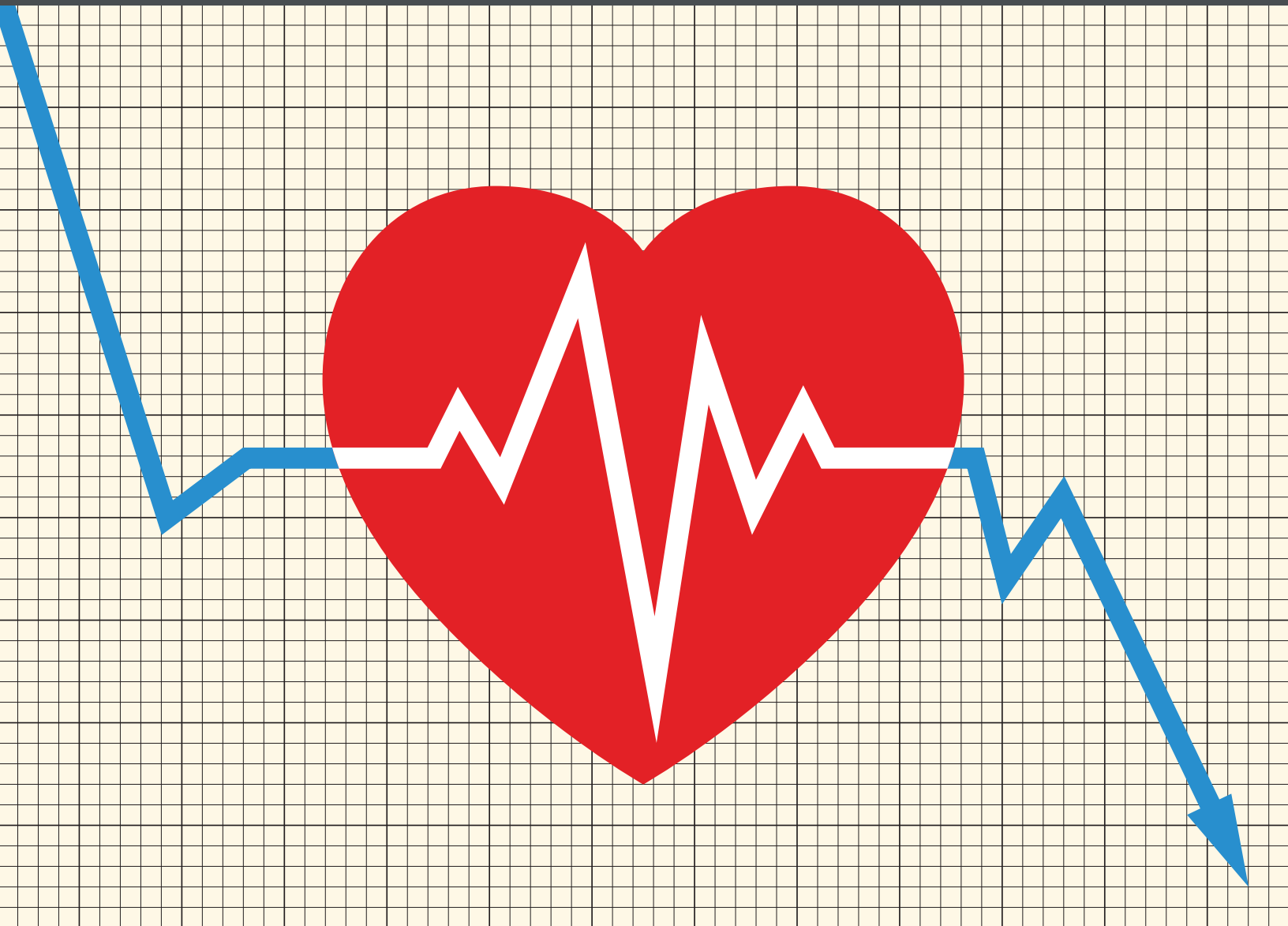


Saving Lives and Saving Money

The Case for Harm Reduction in Kanawha County, WV



WEST VIRGINIA CENTER ON
BUDGET & POLICY

Saving Lives and Saving Money: The Case for Harm Reduction in Kanawha County, WV

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Executive Summary

There is no doubt to residents and policymakers in West Virginia that the state has a drug epidemic problem that is costly in terms of lives lost annually, as well as expenses incurred for medical and mental health treatment, for law enforcement, and for social services provision. In seeking an effective mix of assistance to people with substance use disorders (SUDs) and law enforcement, policymakers both nationwide and in West Virginia have enlisted the help of economists to estimate what SUDs cost communities. The estimates, conservatively calculated in large part due to a lack of available data, are sobering.

For West Virginia (WV), the state with the highest per capita death rate from opioid use in the last decade, the comprehensive opioid cost estimate for 2015 was more than \$8.8 billion, or 12.03 percent of the state's gross domestic product (GDP). As large as this number is, it does not include costs associated with use of non-opioid illicit drugs such as cocaine or methamphetamines which have shown substantial increases in recent years both nationally and in WV.

Very few of these studies focus on costs at the state level, and to our knowledge only one (in New York state) analyzes costs at the county level. This is a critical level of analysis since it is here that many of the costs of illicit drug use are brought to bear and where the vast majority of steps are taken to combat SUDs. Kanawha County, WV sits in the epicenter of the WV drug epidemic. It currently leads the state in the number of deaths from opioids and all overdose deaths. As recently as February 2021, the Centers for Disease Control and Prevention (CDC) identified the outbreak of injection drug use-associated human immunodeficiency virus (HIV) in the county as "the most concerning in the United States." It is against this backdrop that policymakers are debating the costs and benefits of attempting to manage this outbreak, and those of other viral diseases such as hepatitis B and C, through harm reduction programs that offer free clean syringes to people who inject drugs (PWID).

The goal of this study is to assist the community and the policymakers of Kanawha County, WV by providing data and analysis to inform how they will handle the challenges of the current drug epidemic and its increasingly widespread and costly consequences.

First, we estimate the economic damages from drug-related fatalities and non-fatal causes. The results for 2019, the most recent year for which data is available, are as follows:

- In WV, fatality-related damages are close to \$9.9 billion; in Kanawha County, these economic damages are estimated to be nearly \$1.5 billion.
- The economic losses associated with non-fatal illicit drug use totaled to \$1.4 billion in the state of WV; in Kanawha County, they were approximately \$144 million.
- Overall, the total economic damage caused by the drug crisis in West Virginia amounted to about \$11.3 billion; in Kanawha County, the total reached \$1.7 billion. These amounts represent approximately 15 percent of the state and county gross domestic products, respectively.

The second step the report takes is to examine costs not included in these already sobering estimates. Data on some family- and illicit drug user-related expenses are often not kept in a form that acknowledges that they are associated with drug use or are not included in government surveillance programs. Searching available data sets uncovered costs associated with both the families of people with SUDs and the users themselves. We report significant calculations of expenses related to the health and welfare of Kanawha County families including:

- The estimated costs of meeting the needs of opioid-dependent infants at birth (i.e., born with neonatal abstinence syndrome) was at least \$1.3 million in 2017.

- Kanawha County schools may incur an additional \$1.6 million for the 13 years of education for the 2018 cohort of children born with neonatal abstinence syndrome alone.
- Estimates of the annual cost of child placements in the foster care system due to drug-related abuse and neglect in 2018 reached almost \$40.2 million.

Costs associated with medical conditions often contracted by people with SUDs are similarly large and concerning. In Kanawha County alone:

- To treat the 35 new HIV cases reportedly related to intravenous drug use (IDU) in 2020 will cost nearly \$17 million.
- To provide curative treatment for the 635 cases of chronic hepatitis C (HCV) associated with IDU in 2019 is likely as much as \$44.5 million.
- The estimated cost of treating the chronic hepatitis B (HBV) cases likely caused by IDU in 2018 is \$196,000. While this is a relatively small cost, it would be virtually avoidable with regular HBV screening and vaccinations for drug users at a cost of about \$62 per adult.
- Another disease increasingly tied to IDU is infective endocarditis (IE), an infection of the lining of the heart. The 77 IDU-related cases treated at the Charleston Area Medical Center in 2019 cost nearly \$4.2 million.

Given these massive cost estimates from loss of life and costs associated with non-fatal illicit drug use in the short and long run, the need to determine cost-effective measures to ameliorate them is urgent. While few studies of the cost savings available from harm reduction programs are available, we outline how several of these programs function, as well as studies on their benefits and costs. Peer-reviewed studies report:

- The availability of various distribution methods of the overdose reversal drug naloxone may decrease deaths by as much as 65 percent over time.
- New users of syringe services programs (SSPs) are five times more likely to enter drug treatment and about three times more likely to stop using drugs than those who don't use the programs.
- Reductions in HIV and HCV of almost 50 percent are associated with SSPs, according to the federal Department of Health and Human Services.
- Medication-assisted treatments (MATs) are effective in keeping people in treatment and show significant reductions in the risk for overdose, death, HIV, and HCV due to IDU.
- Some of the 120 safe consumption facilities worldwide have reduced fatal overdoses by as much as 50 percent in the long-term. These centers are not yet permitted in the US.

Additional research into the impact of harm reduction programs on crime and law enforcement refutes claims that harm reduction encourages drug use and potential consequences. Among several studies is a 2018 National Institute of Drug Abuse report which finds a return of \$4 to \$7 from each dollar spent on addiction treatment programs due to the decline of drug-related crime and criminal justice costs. Such results can ultimately benefit all community members by reducing expenditures on law enforcement and increasing spending that improve their quality of life.

The overarching conclusion is simple: Harm reduction and treatment will reduce both the heartbreak families suffer when their loved ones die or are chronically ill and the fatal and non-fatal costs associated with illicit substance use that our communities and state bear. What is more complex is identifying and implementing appropriate steps to achieve harm and fatality reductions. This report recommends three types of action. We advocate for:

- **Better data tracking and its more timely distribution.** Public policy is best made when decisionmakers have up-to-date information that allows them to conduct cost-benefit analyses of their options. As this report confirms many times, current statistics do not provide this.

- **A larger number and wider distribution of harm reduction programs in Kanawha County.** With the dramatic increase in HIV and cases of other viral diseases here, time is of the essence. An effective approach might include syringe services programs provided through federally-funded clinics, pharmacies, and HIV treatment sites, as well as mobile services and devoted clinics that build trust and relationships outside of a standard health care setting.
- **Structural changes that enhance the social determinants of health** — conditions in the places where we live, learn, work, and play that influence a wide range of health and quality-of-life outcomes. Such factors, such as low-income level and limited educational attainment, are associated with increased risk of substance use. They must be improved by providing:
 - a living wage and health care benefits;
 - computer technology and internet access to assist in children’s education;
 - healthy air, water, soil, and homes; and
 - broad access to affordable and safe recreation activities, transportation, and a comprehensive network of social services.

All of this is a lot to ask for. The alternative, however, is unbearably costly to families, businesses, communities, and governments at all levels. It is long past time to make meaningful changes.

Introduction

Substance use disorders (SUDs) associated with opioids and other drugs have become an enduring epidemic in the United States. “We are at a precipice and need to act with a sense of urgency. These statistics are alarming and every day we wait to take action is another day we are losing people to addiction and overdose.” Dr. Rahul Gupta, the West Virginia Health Officer and Commissioner for DHHR’s Bureau for Public Health, spoke these words in 2017.¹ Yet today, more than three years later, the overdose epidemic in WV, the country, and the world continues largely unabated. In a December 2020 release, the Centers for Disease Control and Prevention (CDC) reported that the largest number of overdose deaths for any 12-month period on record occurred in the period ending in May 2020. Disruptions in daily life caused by the COVID-19 pandemic are at least partly to blame, according to the CDC.²

Countless essays, documentaries, academic and medical reports, and books have been written about the lives lost to SUDs,³ and their impacts on families, friends, colleagues, and communities both within our state and across the country.⁴ They have sparked debate on whether criminalizing drug use, treating it, or a combination of both is the best approach to addressing the drug crisis. Increasingly, law enforcement studies are finding that efforts to suppress drug use by tighter control of prescriptions and incarceration of those who sell and use drugs fail to reduce drug use and deaths. At the same time, a large and growing literature that highlights multiple types of harm reduction programs and drug treatments with varying levels of effectiveness and costs appear to offer some hope in managing the epidemic.⁵ The Committee on Pain Management and Regulatory Strategies to Address Prescription Opioid Abuse of the National Academies of Science, Engineering, and Medicine Board on Health Policy wrote in its report on the need to balance the risks and benefits of opioid use that a “likely effect of restrictions on lawful access to prescription opioids is that some proportion of persons who have developed OUD [opioid use disorders] will seek to satisfy their needs on the illicit market.” The Committee also “regards the need to couple the long-run public health gain of reduced access with an investment in treatment for the millions of individuals with OUD as an ethical imperative.”⁶ Similarly, the National Institute of Justice convening of state and municipal law enforcement

- 1 West Virginia Department of Health and Human Resources, “DHHR Announces Development of Response to Opioid Abuse,” West Virginia Department of Health and Human Resources, dhhr.wv.gov/News/2017/Pages/DHHR-Announces-Development-of-Response-to-Opioid-Abuse.aspx, West Virginia Department of Health and Human Resources (accessed January 29, 2021).
- 2 Centers for Disease Control and Prevention, “Overdose Deaths Accelerating During COVID-19,” Centers for Disease Control and Prevention, [cdc.gov/media/releases/2020/p1218-overdose-deaths-covid-19.htm](https://www.cdc.gov/media/releases/2020/p1218-overdose-deaths-covid-19.htm) (accessed February 1, 2021).
- 3 In keeping with the definitions used by the National Institute on Drug Abuse, this report uses “drug use” to mean the use of illegal drugs. “Drug misuse” refers to improper or unhealthy use of prescribed medication, which may over time become a substance use disorder. To address both, we use the term “substance use disorders” (SUDs) whose symptoms are grouped in the four categories of impaired control, social impairment, risky use, and pharmacological criteria (i.e., tolerance and withdrawal). National Institute on Drug Addiction, “Media Guide: the Science of Drug Use and Addiction,” National Institute of Health, [drugabuse.gov/publications/media-guide/science-drug-use-addiction-basics](https://www.drugabuse.gov/publications/media-guide/science-drug-use-addiction-basics) (accessed October 1, 2020).
- 4 Katy Schneider, “The Most Essential Books for Wrapping Your Head Around the Opioid Crisis,” *New York Magazine*, nymag.com/strategist/article/essential-books-about-the-opioid-crisis.html; Brightview, “Eight Documentaries about Addiction and Recovery Worth Watching Right Now,” Brightview, brightviewhealth.com/latest-updates/eight-documentaries-worth-watching/; Stoicea, Nicoleta, et al., “Current perspectives on the opioid crisis in the US healthcare system, *Medicine*:90, no. 20 (May 2019), journals.lww.com/md-journal/fulltext/2019/05170/current_perspectives_on_the_opioid_crisis_in_the.10.aspx (all accessed December 10, 2020).
- 5 The Pew Charitable Trusts, “More Imprisonment Does Not Reduce State Drug Problems,” Pew Trusts, [pewtrusts.org/en/research-and-analysis/issue-briefs/2018/03/more-imprisonment-does-not-reduce-state-drug-problems](https://www.pewtrusts.org/en/research-and-analysis/issue-briefs/2018/03/more-imprisonment-does-not-reduce-state-drug-problems) (accessed December 10, 2020).
- 6 JK Phillips, MA Ford, and RJ Bonnie, eds., *Pain Management and the Opioid Epidemic: Balancing Societal and Individual Benefits and Risks of Prescription Opioid Use* (Washington (DC): National Academies Press, 2017), [ncbi.nlm.nih.gov/books/NBK458653/](https://www.ncbi.nlm.nih.gov/books/NBK458653/) (accessed December 10, 2020).

representatives and public safety and public health researchers in 2018 produced 14 recommendations which address outreach to people with SUDs. These include medical treatment, harm reduction, and law enforcement personnel support rather than increasing penalties.⁷

As policymakers have sought to select the most effective mix of programs, laws, and funding to combat the epidemic over recent years, they have enlisted the help of economists to estimate what SUDs cost communities across the country. Their findings are alarming. The most comprehensive of these estimations includes both the lost earnings of overdose fatalities and the costs of treatment, legal proceedings, and productivity losses for individuals using and misusing opioids. The federal Council of Economic Advisors (CEA) estimates that between 2015 and 2018, nationwide costs totaled \$2.5 trillion. The CEA and a conservative economic think tank, the American Enterprise Institute (AEI), both place the cost at more than \$666 billion in 2018 alone, representing more than 3 percent of gross domestic product (GDP).⁸ Analyzing these data at the state level, the AEI researchers found that West Virginia, the state with the highest per capita death rate from opioid use in the last decade, had a comprehensive opioid cost estimate for 2015 of more than \$8.8 billion, or 12.03 percent of the state's GDP.⁹

To our knowledge, very few of these studies focus on costs at the state level. Only one study, conducted by the Fiscal Policy Institute of New York in 2019, has estimated these comprehensive costs at the county level. This is a critical level of analysis since it is at this local level where many of the costs of illicit drug use are brought to bear and where the vast majority of steps are taken to combat SUDs.¹⁰ The goal of this study is similarly to examine the comprehensive cost of non-fatal and fatal drug overdoses in Kanawha County, WV within the context of drug use and misuse and available harm reduction measures. Its selection is based on its position as the epicenter of the drug epidemic in West Virginia and in the country as described in detail below.

The report unfolds in five parts. The first is an overview of the overdose deaths in Kanawha County in the context of West Virginia and the nation. This is followed by an explanation of how the costs of fatal overdoses and non-fatal overdoses are estimated and what the calculations produced. The third section examines costs associated with non-fatal overdoses that are not currently measured or incorporated into comprehensive cost estimations. We argue that if carefully tracked and calculated, these would make the estimates of the total cost of the drug epidemic even higher. Part four introduces harm reduction measures designed to reduce fatalities and to protect the health of those who continue to use drugs. To the extent possible, we look at the financial costs of instituting these measures to provide a sense of what it will take to limit the economic damage from the epidemic. Finally, the report concludes with policy recommendations based on the experience of researching this topic and the findings of the experts cited.

7 Sean E. Goodison et al., "Law Enforcement Efforts to Fight the Opioid Crisis," Rand Corporation, rand.org/pubs/research_reports/RR3064.html (accessed December 10, 2020).

8 The Council of Economic Advisers, "The Underestimated Cost of the Opioid Crisis," White House, whitehouse.gov/sites/whitehouse.gov/files/images/The%20Underestimated%20Cost%20of%20the%20Opioid%20Crisis.pdf (accessed December 10, 2020) and Alex Brill, Scott Ganz, and Burke O'Brien, "The Economic Cost and Spatial Diffusion of the Opioid Crisis, 2009–18," aei.org/wp-content/uploads/2020/06/The-Economic-Cost-and-Spatial-Diffusion-of-the-Opioid-Crisis-2009-18.pdf (accessed December 10, 2020).

9 Alex Brill, "New State-Level Estimates of the Economic Burden of the Opioid Epidemic," American Enterprise Institute, aei.org/health-policy/new-state-level-estimates-of-the-economic-burden-of-the-opioid-epidemic/ (accessed December 3, 2020), and Alex Brill and Scott Ganz, "The Geographic Variation in the Cost of the Opioid Crisis," American Enterprise Institute, aei.org/wp-content/uploads/2018/03/Geographic_Variation_in_Cost_of_Opioid_Crisis.pdf (accessed December 3, 2020).

10 Jonas Shaende and Shamier Settle, "The Staggering Cost of Long Island's Opioid Crisis: The Economics of Addiction," Fiscal Policy Institute (NY), fiscalspolicy.org/wp-content/uploads/2019/09/Report-9_11_19.pdf (accessed September 14, 2020).

PART I

Substance Use Disorders at the National, State, and Local Levels

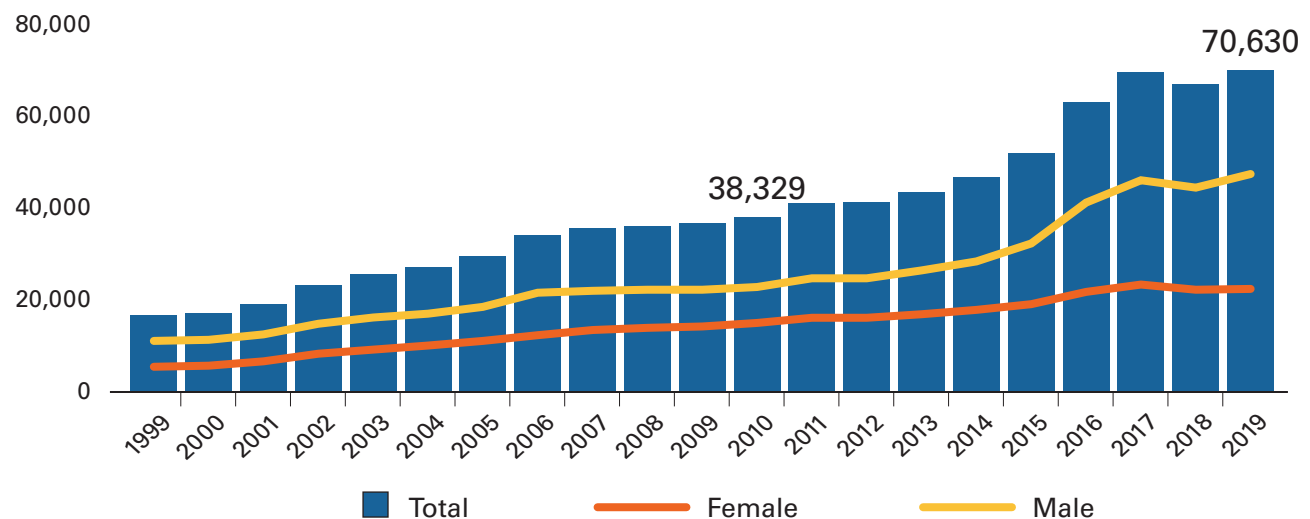
The “Lay of the Land” Nationally

The number of people with substance use disorders, including the misuse of prescription and illicit opioids, cocaine, and other psychostimulants with abuse potential (e.g., methamphetamines), continues to skyrocket in the United States. The age-adjusted rate of overdoses rose 10 percent on average from 1999 through 2006, 2 percent from 2006 through 2013, and 14 percent from 2013 through 2016.¹¹ In 2018, the first year in recent decades registering a decline, 67,367 deaths resulted from all drug overdoses; the rate per 100,000 was 20.7. However, in 2019, the number climbed again to 70,630, a rate of 21.6.¹² Opioid overdoses have commanded the majority of the focus in reporting, and they remain central to both fatal and non-fatal drug overdoses. In 2019, 70.6 percent of overdose deaths nationwide involved opioids.¹³

Figure 1

National Drug-Involved Overdose Deaths

Number among all ages, by gender, 1999-2019



Source: National Institute on Drug Abuse, “Overdose Death Rates,” Centers on Disease Control and Prevention, drugabuse.gov/drug-topics/trends-statistics/overdose-death-rates (accessed February 12, 2021).

Note: Includes deaths with underlying causes of unintentional drug poisoning (X40-X44), suicide drug poisoning (X60-X64), homicide drug poisoning (X85), or drug poisoning of undetermined intent (Y10-Y14), as coded in the International Classification of Diseases, 10th Revision.

11 Holly Hedegaard, Arialdi M. Miniño, and Margaret Warner, “Drug Overdose Deaths in the United States, 1999–2018,” National Center for Health Statistics, cdc.gov/nchs/data/databriefs/db356-h.pdf (accessed December 11, 2020).

12 Holly Hedegaard, Arialdi M. Miniño, and Margaret Warner, “Drug Overdose Deaths in the United States, 1999–2019,” NCHS Data Brief No. 394, December 2020, National Center for Health Statistics, cdc.gov/nchs/products/databriefs/db394.htm#:~:text=In%20contrast%2C%20the%20rates%20of,for%20psychostimulants%20with%20abuse%20potential (accessed February 19, 2021).

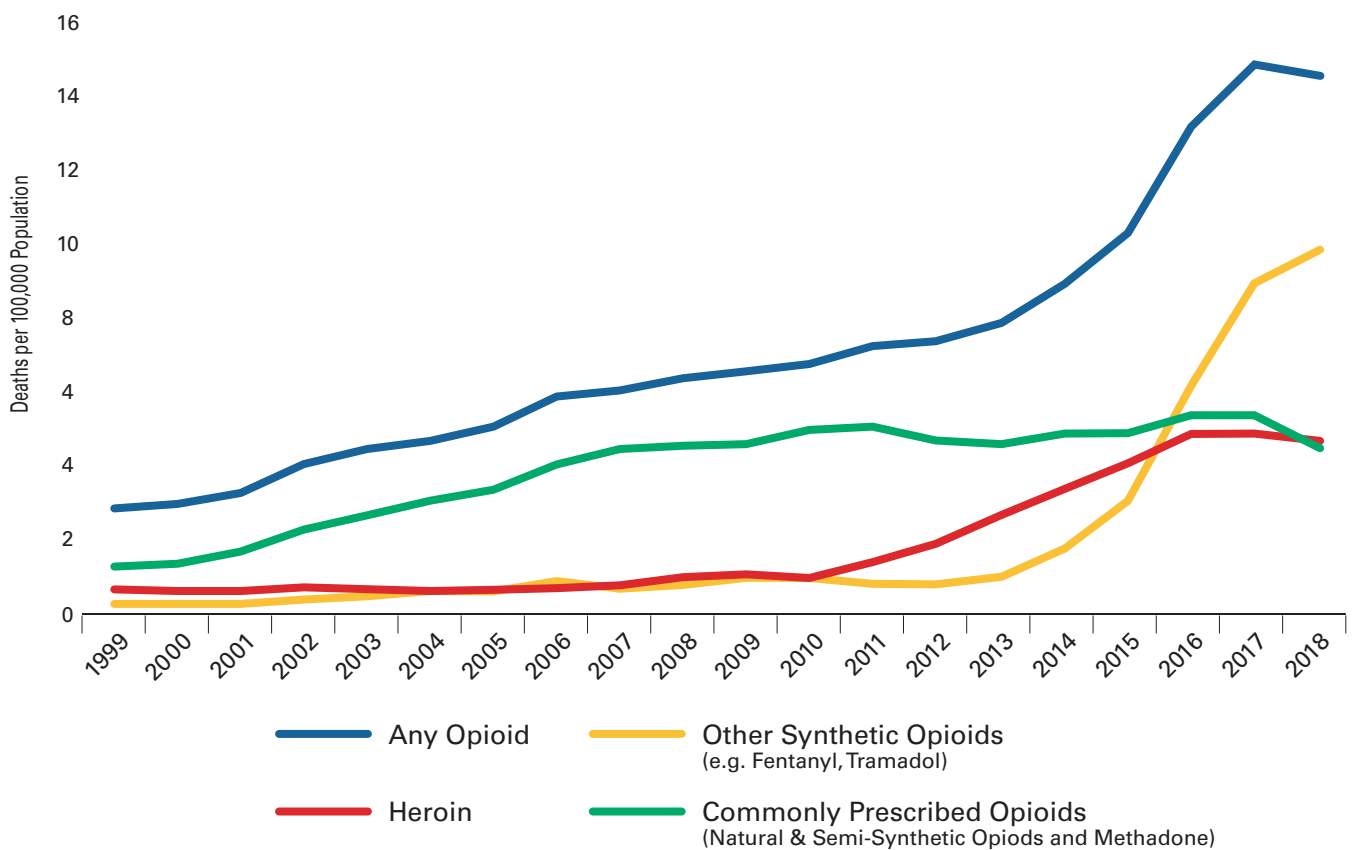
13 National Institute on Drug Abuse, “Overdose Death Rates,” Centers on Disease Control and Prevention, drugabuse.gov/drug-topics/trends-statistics/overdose-death-rates (accessed February 1, 2021).

As alarming as these numbers are, there are other concerning trends within fatal overdose statistics, shown in Figure 2 below. The past decade has witnessed a startling increase in overdose deaths involving synthetic opioids, especially illegally produced fentanyl. Fentanyl is 50 to 100 times stronger than morphine, and its presence in overdose deaths increased 10 percent between 2017 and 2018, and by approximately another 16 percent in 2019.¹⁴ The CDC reports that deaths involving cocaine and methamphetamines and other psychostimulants, with or without opioids, are also on the rise. From 2012 through 2018, the age-adjusted rate of drug overdose deaths involving psychostimulants with abuse potential increased, on average, by 30 percent per year, and stood at 3.9 deaths per 100,000, or 12,676 deaths, in 2018. In 2019, the figure rose again to 5.0 deaths per 100,000, or 16,167 deaths. In the same time period, deaths involving cocaine increased, on average, by 27 percent per year, and stood at 4.5 deaths per 100,000, or 14,666 deaths, in 2018. In 2019, the figure increased 8.3 percent over the previous year to 14.9 deaths per 100,000, or 15,883 deaths.¹⁵

Figure 2

National Opioid-Involved Overdose Deaths

Overdose death rates involving opioids, by type, United States, 1999 - 2018



Source: Centers for Disease Control, "Opioid Overdoses," cdc.gov/drugoverdose/data/analysis.html (accessed February 12, 2021).

14 Centers for Disease Control and Prevention, "Synthetic Opioid Overdose Data," Centers for Disease Control and Prevention, cdc.gov/drugoverdose/data/fentanyl.html (accessed December 1, 2020), and Centers for Disease Control and Prevention, "Fentanyl," Centers for Disease Control and Prevention, cdc.gov/drugoverdose/opioids/fentanyl.html (accessed December 1, 2020).

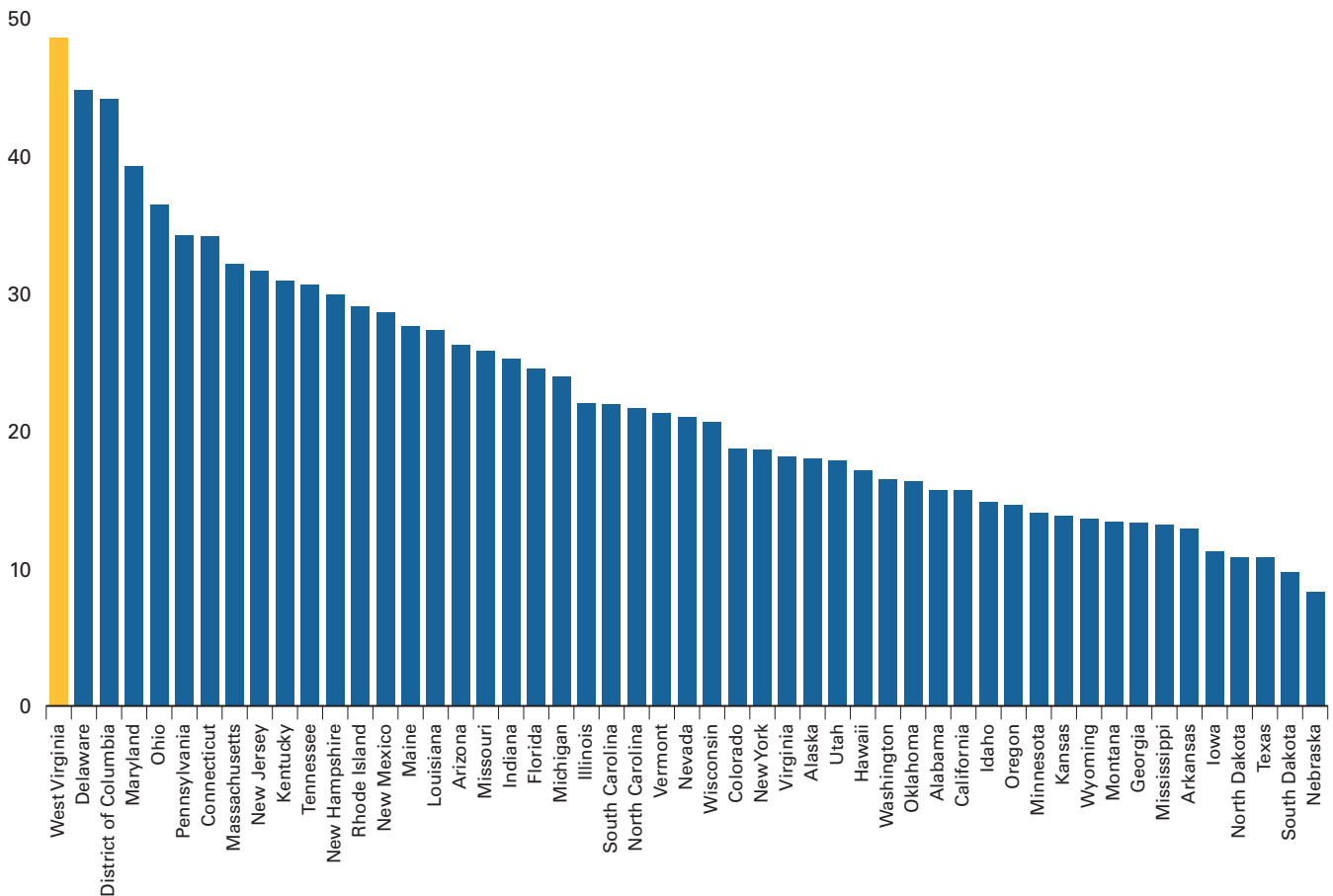
15 Holly Hedegaard, Arialdi M. Miniño, and Margaret Warner, "Drug Overdose Deaths in the United States, 1999–2019," NCHS Data Brief No. 394, December 2020, National Center for Health Statistics, cdc.gov/nchs/products/databriefs/db394.htm#:~:text=In%20contrast%2C%20the%20rates%20of,for%20psychostimulants%20with%20abuse%20potential (accessed February 19, 2021).

West Virginia has held a prominent place in this troubling picture for decades. In each year between 2014 and 2019, the period under consideration, it ranked first in the nation in age-adjusted overdose deaths per 100,000 residents.¹⁶ Of the 872 drug overdose deaths in the state in 2019, 670 involved opioids.¹⁷

Figure 3

West Virginia had the Highest Rate of Drug Overdose Deaths in 2019

Crude rate of drug overdose deaths per 100,000, by state, 2019



Source: Centers for Disease Control and Prevention, WONDER Database <https://wonder.cdc.gov/controller/saved/D77/D96F306>, downloaded October 23, 2020.

West Virginia mirrors the national trend in that psychostimulant involvement in overdose deaths is rising. For example, rate of growth in overdose deaths statewide involving methamphetamine alone between 2014 and 2018 was 585 percent, and for methamphetamine and opioids combined, an astounding 1,527 percent.¹⁸ Bob Hansen, former Executive Director of the West Virginia Office of Drug Control Policy, acknowledged in 2020 that “in West Virginia, drug usage is changing, but it points to that people are using a variety of substances,

16 Centers for Disease Control and Prevention, “2018 Drug Overdose Death Rates,” cdc.gov/drugoverdose/data/statedeaths/drug-overdose-death-2018.html (accessed February 3, 2021).

17 Vital Statistics System, Drug Overdose Database, December 15, 2020, West Virginia Health Statistics Center, drive.google.com/file/d/12AX3hx_QDs-gh-L0x-mHnSobdlaJquTK/view?ts=602f1782 (accessed February 18, 2021).

18 Office of Drug Control Policy, “Fatal Overdose in West Virginia - Overview,” West Virginia Department of Health and Human Resources, dhhr.wv.gov/office-of-drug-control-policy/datadashboard/Pages/default.aspx (accessed October 6, 2020).

and we can definitely see a trend of meth being present in many of these fatalities.”¹⁹ A major concern with cocaine- and methamphetamine-involved usage is that, in contrast to opioid use disorder (OUD), where medication-assisted treatments (MATs) are available for recovery and naloxone for overdose reversal, treatment for these addictions is more limited.²⁰ This adds to the dangers, complexity, and costs of SUDs in West Virginia’s future. For these reasons, this study focuses on all drug deaths rather than the analysis of opioid-related deaths alone found in many other studies.

Why Is West Virginia Central to the Drug Epidemic Story?

At first glance, the above rankings seem outsized in comparison to other state demographics. West Virginia is a small state geographically and in population size (41st in area²¹ and 38th in residents²²). But its natural resource-based economy has experienced a decades-long decline, plaguing it with poverty, unemployment, long-term disabilities associated with mining, and a perennially low labor force participation rate. In 2019, WV’s poverty rate was 16 percent, well above the national rate of 10.5 percent and one of the highest in the country.²³ Its labor force participation rate is likewise one of the lowest in the country, hovering around 54 percent compared to a national average around 63 percent.²⁴ Its unemployment rate was the fourth highest in the country in 2019.²⁵

As is the case in many rural regions, these factors, along with low educational attainment, high-risk behaviors, and isolation, exacerbate the need for physical and mental health care.²⁶ The United Health Foundation (UHF) and the Commonwealth Fund provide rankings by state of the overall physical, mental, and social well-being of their populations and their health system performance including access to health care, service use, and health outcomes. Both place WV among the worst rankings among all the states.²⁷ In its 2020 America’s Health Rankings report, UHF ranks WV 47th on its economic hardship index, 50th in the incidence of depression, 50th in adults with frequent physical distress,

19 Caity Coyne, “As Total Fatal Overdoses Drop in WV, Those Involving Meth Are Still on Rise,” *Charleston Gazette*, July 10, 2020, wvgazette.com/news/health/as-total-fatal-overdoses-drop-in-wv-those-involving-meth-are-still-on-rise/article_3356a2c5-1217-591d-b064-a6f91e3cc364.html (accessed October 19, 2020).

20 National Institute on Drug Abuse, “What treatments are effective for people who misuse methamphetamine?” National Institutes on Health, drugabuse.gov/publications/research-reports/methamphetamine/what-treatments-are-effective-people-who-misuse-methamphetamine (accessed November 30, 2020), and National Institute on Drug Abuse, “Cocaine Drug Facts,” National Institutes on Health, drugabuse.gov/publications/drugfacts/cocaine (accessed December 1, 2020).

21 Wikipedia, “List of U.S. states and territories by area,” Wikipedia, en.wikipedia.org/wiki/List_of_U.S._states_and_territories_by_area (accessed December 8, 2020).

22 Infoplease, “State Population by Rank” Infoplease, infoplease.com/us/states/state-population-by-rank (accessed December 8, 2020).

23 US Census Bureau, “Quick Facts: West Virginia,” US Census Bureau, census.gov/quickfacts/WV/ (accessed December 8, 2020).

24 PolitiFact, “Does West Virginia have the nation’s lowest workforce participation rate?,” PolitiFact, politifact.com/factchecks/2019/feb/27/e-gordon-gee/does-west-virginia-have-nations-lowest-workforce-p/ (accessed December 18, 2020).

25 Statista, State unemployment rate in the U.S. 2019, Statista, statista.com/statistics/223675/state-unemployment-rate-in-the-us/ (accessed December 8, 2020).

26 Rural Health Information Hub, “Substance Use and Misuse in Rural Areas,” Rural Health Information Hub, ruralhealthinfo.org/topics/substance-abuse (accessed October 15, 2020).

27 United Health Foundation, “America’s Health Rankings: West Virginia,” United Health Foundation, americashealthrankings.org/explore/annual/measure/Overall_a/state/WV (accessed December 7, 2020) and David C. Radley, Sara R. Collins, and Jesse C. Baumgartner, “2020 Scorecard on State Health System Performance,” The Commonwealth Fund, commonwealthfund.org/publications/fund-reports/2020/sep/2020-scorecard-state-health-system-performance (accessed February 7, 2021).

50th in premature death, and 50th in drug-related deaths per 100,000 in 2019.²⁸ The state's overall ranking for 2018 was 45th.²⁹ The Commonwealth Fund 2020 Scorecard on State Health System Performance (based on 2019 data) placed WV as 47th in its overall scoring, and last in the categories of Avoidable Hospital Use and Cost and Healthy Lives. The poor ranking in Healthy Lives was designated in part due to WV's top ranking in drug overdose deaths.³⁰

In addition to its outsized ranking in overdose deaths in proportion to population and geographic rankings, the health care impacts of non-fatal drug use and misuse in WV are also outsized. Many of these diagnoses require long-term treatment and ultimately lead to premature death. Perhaps foremost among these is human immunodeficiency virus (HIV). In 2018, the Centers for Disease Control and Prevention (CDC) identified 220 counties in the U.S. as "most vulnerable" to HIV and/or hepatitis C (HCV) outbreaks resulting from the substance use epidemic. WV counties were 14 percent (28) of the total number, and further HIV outbreaks have recently emerged.³¹ It also had the largest number of vulnerable counties among the states in the report (28 of 55 counties, or 51 percent). Additional medical conditions that appear unusually high in WV due to the drug use epidemic are hepatitis B (HBV) and infective endocarditis (IE). The costs of these illnesses will be considered in this study. It is important to note that these are not the only chronic and potentially fatal conditions stemming from substance use disorders. However, data limitations require that we focus on just a few.

Why Focus on Kanawha County?

The particular focus of this report is Kanawha County, WV. It is the state's largest county by population, at 178,124 residents.³² Charleston, its largest city with 47,215 residents,³³ is also the state's capital. Among WV's 55 counties, it has ranked in the top 7 in age-adjusted overdose death rates in 2014 through 2019. For much of that time, Cabell County, the fourth most populous county in the state with a population of 91,945,³⁴ led the state in both overdose death rates and actual number of deaths. However, after initiating a comprehensive drug intervention program in 2016, Cabell County's fatal overdose number fell by nearly half (202 deaths in 2017 to 111 deaths in 2019), while Kanawha County's fatal overdose number remained between 150 and 153 in the same three years and is now first among WV counties.³⁵

28 United Health Foundation, "America's Health Rankings: 2020 Annual Report," assets.americashealthrankings.org/app/uploads/ahr-annual-report-2020.pdf (accessed December 8, 2020).

29 United Health Foundation "America's Health Rankings: West Virginia," United Health Foundation, assets.americashealthrankings.org/app/uploads/westvirginia-health-summary-2019.pdf (accessed December 8, 2020).

30 David C. Radley, Sara R. Collins, and Jesse C. Baumgartner, "2020 Scorecard on State Health System Performance," The Commonwealth Fund, 2020scorecard.commonwealthfund.org/state/west-virginia (accessed December 9, 2020).

31 Centers for Disease Control and Prevention, "Vulnerable Counties and Jurisdictions Experiencing or At-Risk of Outbreaks," Centers for Disease Control and Prevention, cdc.gov/pwid/vulnerable-counties-data.html (accessed December 9, 2020).

32 US Census Bureau, "QuickFacts Kanawha County, West Virginia," US Census Bureau, census.gov/quickfacts/kanawhacountywestvirginia, westvirginia-demographics.com/counties_by_population (accessed December 9, 2020).

33 World Population Review, "Charleston, WV, Population 2021," World Population Review, worldpopulationreview.com/us-cities/charleston-wv-population (accessed December 9, 2020).

34 US Census Bureau, "QuickFacts Cabell County, West Virginia," US Census Bureau, census.gov/quickfacts/cabellcountywestvirginia (accessed October 14, 2020), and Cubit, "West Virginia Counties by Population" Cubit, westvirginia-demographics.com/counties_by_population (accessed October 14, 2020).

35 Office of Drug Control Policy, "Fatal Overdoses in West Virginia," WV Department of Health and Human Resources, dhr.wv.gov/office-of-drug-control-policy/datadashboard/Pages/default.aspx (accessed February 1, 2021).

Figure 4

Number of Deaths from All Drug Overdoses and Overdose Rates

Year	Number of Overdose Deaths			Overdose Rate/100,000	
	West Virginia	Kanawha County	Cabell County	Kanawha County	Cabell County
2015	735	122	102	68	111
2016	890	130	134	73	146
2017	1,019	151	202	85	220
2018	903	150	151	84	164
2019	871	153	111	86	121

Sources: West Virginia Office of Drug Control Policy, Data Dashboard, Fatal Overdoses in West Virginia – Overview, Source dhr.wv.gov/office-of-drug-control-policy/datadashboard/Pages/default.aspx, downloaded February 12, 2021.

Some may question our choice of focus on Kanawha County, arguing that nearby Cabell County has more clearly occupied the bullseye of the drug crisis. In August 2016, 26 people in Cabell County overdosed from fentanyl-laced heroin in a five-hour period. Officials now say that while this was not the first time concern about the drug epidemic surfaced, it was a defining wake-up call. Since then, Cabell County has chosen to meet its substance use disorders by developing a full array of prevention and early intervention, treatment, and recovery support programs with collaborations between public officials, law enforcement, health care systems, universities, non-profits, and faith-based organizations beginning in 2016.³⁶

In contrast, Kanawha County has one small clinic-based syringe services program (SSP), a second SSP run by the grassroots nonprofit organization Solutions Oriented Addiction Response (SOAR), and a few programs for neonatal abstinence syndrome (NAS) and medication-assisted treatment (MAT). Elected officials and the public continue to debate the value of harm reduction programs. A short-lived, successful syringe exchange service program run through the Kanawha-Charleston Health Department in Charleston between December 2015 and March 2018 was closed under the pressure of police and complaints from the mayor.³⁷ In fall 2020, the police department and mayor also forced SOAR to curb its needle exchange activities, threatening legal action for violation of a municipal ordinance.³⁸

With minimal services in the county available to people with SUDs and given current trends in both fatal and non-fatal overdoses, this problem promises to stay with Kanawha County for quite some time.³⁹ And make no mistake — the epidemic impacts the entire community. Individuals are touched by losses of family members, by the rise in the number of grandparents and other relatives caring for the children of people with SUDs, by the overloading of the foster care system unable to fully meet the needs that families cannot, by the economic and emotional costs of seeking effective treatment for loved ones, and more. And even those of us who think we are not impacted are. While many people who use drugs lead productive work lives, there are a significant number who require greater access to health care services and leave time, as well as experience lower productivity and higher turnover. As consumers, we pay for these impacts via

36 “The City of Solutions: Huntington, WV,” Division of Addiction Sciences, Department of Family and Community Health, Marshall University School of Medicine, philanthropywv.org/content/uploads/2019/11/COS-Guidebook-Finalized-as-of-9-26-19.pdf (accessed February 1, 2021).

37 Allen et al., “Understanding the public health consequences of suspending a rural syringe services program: a qualitative study of the experiences of people who inject drugs,” *Harm Reduction Journal* 16, no.33 (2019) harmreductionjournal.biomedcentral.com/articles/10.1186/s12954-019-0305-7 (accessed December 10, 2020).

38 Kyle Vass, “Syringe Distribution Meets City Roadblock Amid Ordinance Concerns,” West Virginia Public Broadcasting, wvpublic.org/health-science/2020-12-04/syringe-distribution-meets-city-roadblock-amid-ordinance-concerns (accessed December 11, 2020).

39 See for example of harm reduction program users’ experiences: Colin Miller, “On a Mission to Show Up for Drug Users in West Virginia,” *Filter*, October 22, 2019, filtermag.org/drug-users-west-virginia/ (accessed February 17, 2021).

more expensive products and services. As taxpayers, we also pay for the drug enforcement, incarceration, and legal proceedings of those charged with drug-related crimes, and for the health care and social services of those who continue to use drugs or who are trying to end their use.

The question that has not been successfully addressed is: What do substance use disorders cost Kanawha County in terms of lost workers/consumers, legal interventions, health care, and social services? Our study's purpose is to make a comprehensive estimate of the economic costs for Kanawha County of substance use disorders for 2015 through 2019, the most recent five-year period for which there is data. Together with estimates of harm reduction and treatment costs, this data provides policymakers with what they need to make informed choices about how best to manage this pressing challenge to the economic, political, and social well-being of Kanawha County and the state's largest and capital city, Charleston.

Calculations of Damages from Substance Use Disorders in West Virginia and Kanawha County⁴⁰

Calculating the Economic Damages of Fatal Overdoses

The methodology chosen in this study for the evaluation of the economic damage in West Virginia due to fatal drug overdoses is widely used throughout the literature. Notably, the Council of Economic Advisors to the President of the United States used it in their 2017 analysis of the opioid epidemic in the US.⁴¹

As mentioned above, substance use disorders are associated with two types of costs: fatality and non-fatality costs. Fatality costs are those connected with premature death. Non-fatality costs are those incurred by individuals who suffer health, economic, and social consequences from substance use. The total cost of the drug epidemic is the sum of these fatality and non-fatality costs.

To calculate the permanent, irrecoverable damage of fatality costs depends on an economic concept called the “Value of a Statistical Life” (VSL). When people die, their loss is also a loss to the economy in the form of work they might have done, for example, or purchases and investments they might have made. The VSL is a way to estimate in dollars how much their absence costs the economy. Governments consistently base cost-benefit analyses on VSL measures that are designed to estimate the monetary value of the expected benefits of fatality risk-reduction associated with given proposed policies. We apply an empirically-estimated range of VSL of \$3.4 million for individuals over age 55 and \$9.7 million for individuals aged 35 to 44 (in 2000 dollars) as established in Aldy and Viscusi.⁴² The range is designed to realistically demonstrate how the VSL rises and then falls with age across the population and over the life cycle, challenging conventional assumptions that VSL steadily declines with age.⁴³ Appendix Figure 1 shows the age distribution of drug overdose deaths in West Virginia in 2019, as well as the inflation-adjusted VSL estimates used in this analysis. In West Virginia, drug overdose deaths occurred relatively evenly across all age groups. Each of these VSL figures is multiplied by the corresponding number of drug overdose deaths for each age category obtainable in the Centers for Disease Control WONDER database. The VSL estimates used in this study are in current dollars.

Based on this method, our estimate of the economic damages caused by drug-related fatalities in West Virginia totaled around \$9.7 billion in 2018 and \$9.8 billion in 2019. In Kanawha County, these economic damages are estimated to be nearly \$1.3 billion in 2018 and \$1.5 billion in 2019.

40 This section was prepared in partnership with the Fiscal Policy Institute and mostly following the methodology used in Jonas Shaende and Shamier Settle, 2019. “The Staggering Cost of Long Island’s Opioid Crisis: The Economics of Addiction,” Fiscal Policy Institute: NY, https://fiscalspolicy.org/wp-content/uploads/2019/09/Report-9_11_19.pdf.

41 The Council of Economic Advisors, “The Underestimated Cost of the Opioid Crisis,” The White House, [whitehouse.gov/sites/whitehouse.gov/files/images/The%20Underestimated%20Cost%20of%20the%20Opioid%20Crisis.pdf](https://www.whitehouse.gov/sites/whitehouse.gov/files/images/The%20Underestimated%20Cost%20of%20the%20Opioid%20Crisis.pdf) (accessed January 15, 2021).

42 J. Aldy and W. Viscusi, W, “Adjusting the Value of a Statistical Life for Age and Cohort Effects,” *Review of Economics and Statistics* 90, no.3 (2007), law.vanderbilt.edu/files/archive/279_Adjusting-VSL-for-Age-and-Cohort-Effects.pdf (accessed January 1, 2021).

43 The age-dependent VSLs for 2018 used are as follows: 18-24 VSL of \$5.6 million, 25-34 VSL of \$14.1 million, 35-44 VSL of \$14.4 million, 45-54 VSL of \$12 million, 55-64 VSL of \$5.1 million. The age-dependent VSLs for 2017 used are as follows: 18-24 VSL of \$5.4 million, 25-34 VSL of about \$13.7 million, 35-44 VSL of about \$14 million, 45-54 VSL of about \$11.7 million, 55-62 VSL of \$5 million.

Calculating the Economic Costs of Non-Fatal Substance Use

Non-fatal substance use imposes a cost on those who use, as well as the broader society. These non-fatality costs are estimated in two steps. First, because there is no state-collected data on the number of residents who use illicit drugs in a given year, we access from the Substance Abuse and Mental Health Services Administration (SAMHSA) estimates of the share of such people in West Virginia in a given year.⁴⁴ By multiplying this percentage by the total population of West Virginia, we are able to estimate the total number of individuals who engage in illicit drug use in West Virginia. An estimate for the number of illicit drug users in Kanawha County is found by multiplying the share of the county population by the estimate of the total number of illicit drug users in West Virginia. Appendix Figures 2 and 3 show these calculations.

The second component of our non-fatality cost estimate includes a computation of the average cost that individuals who use drugs incur in the form of increased consumption of health care, law enforcement, and social services in a given year. The CEA uses the estimate in Florence et al. that concludes these costs amount to \$30,000 per person.⁴⁵ With respect to WV, our estimated non-fatality costs totaled to approximately \$1.5 billion in 2018 and \$1.4 billion in 2019 (see Appendix Figures 2 and 3). In Kanawha County, our estimated non-fatality costs totaled to approximately \$156 million in 2018 and \$144 million in 2019 (again, see Appendix Figures 2 and 3).

Total Economic Damages in West Virginia and Kanawha County

Overall, the total economic damage caused by the drug crisis in West Virginia amounted to about \$11.3 billion in 2019. In Kanawha County, the total reached \$1.7 billion in that year (see Figure 5 below).

Figure 5

Total Fatal and Non-Fatal Damages for West Virginia and Kanawha County, 2018 and 2019

	West Virginia		Kanawha County	
	2018	2019	2018	2019
Fatality Costs	\$9.719 billion	\$9.870 billion	\$1.268 billion	\$1.525 billion
Non-Fatality Costs	\$1.545 billion	\$1.447 billion	\$156 million	\$ 144 million
Total Costs (Fatality and Non-Fatality Costs, Rounded)	\$11.3 billion	\$11.3 billion	\$1.4 billion	\$1.7 billion

Sources: Appendix Figures 1-3

These dollar amounts represent approximately 14.5 percent of all the goods and services produced in the state, or its gross domestic product (GDP). Similarly, at the county level, the damages were equal to about 14.9 percent of Kanawha County's GDP in 2019 (see Figure 6). Perhaps a more familiar comparison — to the cost of operating Kanawha County and Charleston city governments over a fiscal year — makes clear the enormity

44 Substance Abuse and Mental Health Services Administration (SAMHSA), Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2017 and 2018, Table 20: Illicit Drug Use in the Past Year, by Age Group and State, SAMHSA, [samhsa.gov/data/report/2017-2018-nsduh-state-prevalence-estimates](https://www.samhsa.gov/data/report/2017-2018-nsduh-state-prevalence-estimates) (accessed January 1, 2021).

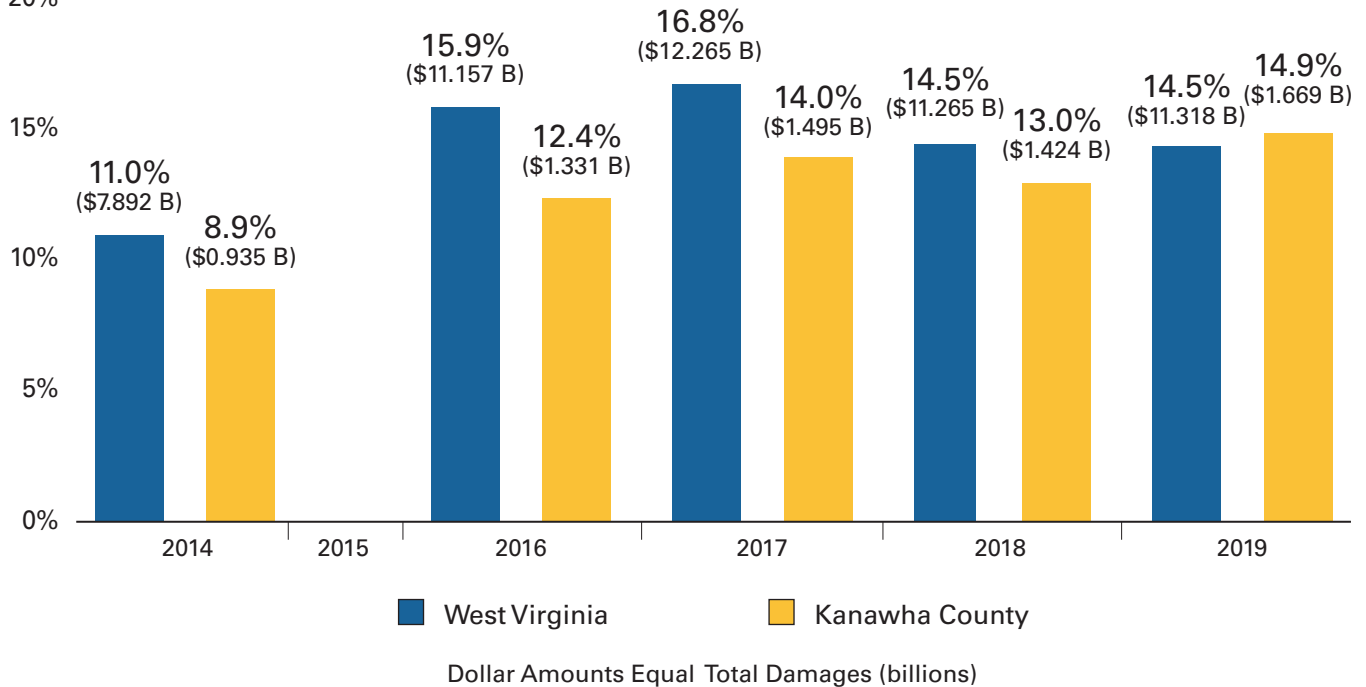
45 C. Florence, et al., "The Economic Burden of Prescription Opioid Overdose, Abuse, and Dependence in the United States, 2013," *Medical Care*, 54 no. 10 (2016): 901-906, [ncbi.nlm.nih.gov/pmc/articles/PMC5975355/](https://pubmed.ncbi.nlm.nih.gov/pmc/articles/PMC5975355/) (accessed January 15, 2021).

of the expense. The economic losses of the county’s drug epidemic is about 30 times the size of its Fiscal Year 2018/2019 budget of about \$57 million and almost 17 times the size of the Charleston operating budget.⁴⁶

Figure 6

Total Economic Damages Equal Nearly 15 Percent of West Virginia’s and Kanawha County’s Respective GDPs in 2019

Total damages as a percent of gross domestic product of state of West Virginia and Kanawha County, respectively



Source: FPI analysis of data from SAMHSA and ACS, FRED, Federal Reserve Bank of St. Louis

These estimates of how much larger the output of the state and county could have been without damages caused by the overdose crisis are even more concerning when we look at them over time. Real GDP in West Virginia had only grown 2.85 percent in the last five, relatively prosperous years between 2015 and 2019. What’s more, Kanawha County GDP had actually declined 2.69 percent.⁴⁷ Nationally, real GDP grew 17.62 percent in the same period.⁴⁸

One way to interpret this is that many more goods and services could have been produced by the businesses in West Virginia and Kanawha County absent the growing dependence on drugs among the residents. But another way to understand the impact of these numbers is to consider how the incomes generated by individuals, had they not died, would have been used. When people are gone or unable to work because of illness associated with their SUDs, their potential earnings also disappear, shifting even larger burdens to surviving spouses, partners, parents, children, and friends. We turn to some of these costs next.

46 Kanawha County Commission, “General Fund Budget By Category,” August 23, 2018, kanawha.us/wp-content/uploads/2018/12/Budget-FY-18-19.pdf (accessed February 1, 2021), and City of Charleston, “Municipal Budget July 1 2018 through June 2019,” July 2, 2018, charlestonwv.gov/sites/default/files/documents/2018-10/municipal_Budget_June_30_2019.pdf (accessed February 1, 2021).

47 US Bureau of Economic Analysis, Real Gross Domestic Product: Government and Government Enterprises in Kanawha County, WV, downloaded from FRED, Federal Reserve Bank of St. Louis; fred.stlouisfed.org/series/REALGDPGOVT54039, October 15, 2020, 2020 and January 18, 2021.

48 World Bank, “GDP (constant LCU) - United States,” World Bank, data.worldbank.org/indicator/NY.GDP.MKTP.KN?locations=US&view=chart (accessed January 21, 2021).

PART III

Additional Health and Social Impacts, Additional Costs

Why We Look Beyond the Current Estimations

The calculations above are sobering. They tell a critical part of the story of the drug epidemic's impact, but do not account for the day-to-day toll on the families and communities of individuals with a SUD. As Judith Feinberg, MD, Professor of Behavioral Medicine and Psychiatry at West Virginia University School of Medicine notes:

When most people think about the impact of the opioid epidemic, they rightly focus on the overwhelming number of lives lost to fatal overdose: over 760,000 since 1999. Sadly, that is just the tip of the iceberg. There is a significant range of destructive intertwined epidemics ("syndemics"): permanent brain damage in some overdose survivors; Hepatitis A, B and C; HIV outbreaks in Huntington and Charleston; babies born in opioid withdrawal from maternal drug use; damaged brain development from in utero drug exposure leading to behavioral and intellectual disabilities; the destruction of families; and over 7,000 children in foster care and the potential limitations. This is a tragedy of human, social, and economic costs.⁴⁹

Understanding these additional costs is made more challenging by the fact that data on the human, social, and other economic costs of the drug addiction crisis are not routinely kept and are often difficult to track.

The non-fatality damage estimates above focus on the immediate costs, including the near-term cost of the substance users' health care and their use of social and legal services. The estimates are not designed to consider the costs of care for drug-related conditions over time. Accordingly, someone with a SUD who develops a chronic viral infection such as HIV or hepatitis C from using contaminated syringes to inject drugs, or someone who develops a serious heart infection (endocarditis), may undergo extended treatment that is not accounted for in the calculations. As Florence et al., note:

Ideally, the economic burden of an adverse health outcome would be estimated by calculating the lifetime cost of the condition — that is, observing the condition from its onset until it ends. Then, the total value of preventing the condition from occurring would be known.⁵⁰

Because the incidence of medical conditions (other than fatal overdoses) is not specifically tracked by public health data systems, researchers must regularly develop their own, often incomplete data sources. However, medical practitioners identify a wide range of long-term health care and social service costs associated with drug use.

Here we consider briefly the costs associated with neonatal abstinence syndrome, educating learning-disabled children who suffered fetal drug exposure, and placements into foster care. This is not to argue that children do not suffer other immediate costly impacts or that additional secondary impacts do not occur when their education and socialization are disrupted by frequent moves and inconsistent schedules, etc. Rather, these are simply three frequently-cited costs that fall outside of current estimates for which some data are available.

49 Personal correspondence, Judith Feinberg, MD, Professor of Behavioral Medicine and Psychiatry, West Virginia University School of Medicine, February 14, 2021.

50 C. Florence, et al., "The Economic Burden of Prescription Opioid Overdose, Abuse, and Dependence in the United States, 2013," *Medical Care*, 54 no. 10 (2016): 901-906, ncbi.nlm.nih.gov/pmc/articles/PMC5975355/ (accessed February 1, 2021).

Likewise, we examine the costs of a few medical conditions associated with SUDs. Especially for people who inject drugs (PWID), HIV and hepatitis C and B (HCV and HBV) are conditions requiring care ranging from months to a lifetime. Endocarditis requires six weeks of hospitalization for intravenous antibiotics, and in some cases, cardiac surgery and stays in medical and surgical intensive care units with subsequent rehabilitative care. These, of course, are not the only health consequences of SUDs, but there is even less information available on the wide range of conditions people who use drugs can suffer. For example, while bacterial skin and soft tissue infections (e.g., cellulitis, abscess) are the most common conditions among PWID, these are not reportable conditions, so incidence and cost data are difficult to assess. Less common, but also unknown and far more devastating, is the incidence and cost of caring for those with irreversible brain damage from overdose. We acknowledge that these and other conditions exist, but do not attempt to estimate their costs here.

The Children of People with SUDs

Neonatal Abstinence Syndrome (NAS)

Neonatal abstinence syndrome (NAS) is a condition in newborns who undergo withdrawal from maternal opioid use and whose symptoms include irritability, diarrhea, non-stop crying that is inconsolable, and failure to thrive. NAS frequently requires the use of opioids to ease the symptoms of abrupt withdrawal. The majority, 60 to 80 percent of neonate babies born to mothers with opioid use disorder while pregnant have NAS.⁵¹ Measurement of the number of cases that occur on the national, state, and county level each year have varied largely because of lack of a clear definition of NAS which results in inconsistent hospital coding.⁵² After the publication of the International Classification of Disease, 10th Revision (ICD-10), federal health agencies collaborated to update national and state NAS rates, described in cases per 1,000 hospital births. The number of NAS cases among births outside of hospitals is likely significantly underreported, with a portion of these cases only identified upon later hospital admission.⁵³

Data collected between 2010 and 2017 by the Centers for Disease Control and Prevention (CDC) Healthcare Cost and Utilization Project (HCUP) and reported by Hirai, et al. indicate that nationally, NAS increased 82.5 percent from 4.0 to 7.3 per 1,000 hospital births. Although there is considerable variation among states, WV regularly has the highest NAS rate in the country. In 2017, WV's rate was 53.5, an increase of 283 percent from 2010.⁵⁴ The rate in Kanawha County that year was reported at 39.4, with a dramatic increase to 54.3 for the first six months of 2020 (see Figure 7).

Estimates of the treatment costs for NAS newborns vary widely and are not directly comparable, not only because there is no universally accepted definition, but also because of the range in NAS severity and discrepancies regarding whether or not physician fees were included in the calculations. The 2021 study by Hirai, et al. reports a cost of \$18,800 for the approximately 11-day hospital stay for a NAS baby in 2017. Applying this cost to the 71 NAS cases in Kanawha County reported by Project WATCH and DHHR in 2017 reveals that at least \$1.33 million was spent on meeting the needs of opioid-dependent infants at birth.

51 Elizabeth R. Wolf, et al., "A state-level study of opioid use disorder treatment access and neonatal abstinence syndrome," *BMC Pediatrics*, 19, no. 371 (2019) bmcpediatr.biomedcentral.com/articles/10.1186/s12887-019-1718-x (accessed December 30, 2020).

52 Dennis Thompson, "Opioid-Addicted Babies Cost U.S. More Than \$500 Million Annually," *US News and World Report*, December 16, 2019, usnews.com/news/health-news/articles/2019-12-16/opioid-addicted-babies-cost-us-more-than-500-million-annually (accessed December 30, 2021).

53 Ashley H. Hirai, et al., "Neonatal Abstinence Syndrome and Maternal Opioid-Related Diagnoses in the US, 2010-2017" *JAMA Network* 325 no.2 (2021), jamanetwork.com/journals/jama/article-abstract/2774834 (accessed January 21, 2021).

54 Ashley H. Hirai, et al., "Neonatal Abstinence Syndrome and Maternal Opioid-Related Diagnoses in the US, 2010-2017" *JAMA Network* 325 no.2 (2021), jamanetwork.com/journals/jama/article-abstract/2774834 (accessed January 21, 2021).

Learning Disabilities

Experts note that there are likely many additional costs associated with caring for a child born with NAS over their lifetime. NAS is associated with multiple long-term health problems including birth defects, hearing and eye conditions, and motor activity and brain function issues, all of which may require care throughout the individual's life at a cost that would be difficult to calculate.⁵⁵ A 2019 study published in the American Journal of Managed Care estimated the additional cost of just one year of special education for children born in Pennsylvania in 2015 with NAS at \$8.2 million, and the cost of that cohort's 13-year education career at \$91 million.⁵⁶ Utilizing the same methodology, using 2017/18 Kanawha County per pupil costs of \$11,485 and applying it to the 2018 cohort of 63 Kanawha County NAS births reported by Project WATCH and DHHR, there will be an additional \$126,909 per year in special education costs borne by the state and county government.⁵⁷ While this annual figure appears small, over 13 years, the estimate (not adjusted for inflation or changes in expenditures) for the 2018 cohort alone is \$1,649,820. Unless the NAS birthrate falls significantly in WV and, particularly, in Kanawha County, significant costs to educate children born with NAS will accrue annually.

Foster Care

Across the country in Fiscal Year 2018, there were more than 437,000 children in foster care.⁵⁸ While this represents a slight decrease from the previous fiscal year, figures for WV are still rising with successive increases each year since 2013. In 2018, a total of 7,073 children lived in foster care, with 4,987 new entrants that year alone.⁵⁹ In 2020, West Virginia's Department of Health and Human Services (DHHR) reported that the state's rate of removal from parental custody is the highest in the nation, and that drugs are involved in 83 percent of open child abuse and neglect cases. The number of cases has risen 71 percent over the last decade.⁶⁰

Estimated costs associated with foster care vary widely with no standard measure reported on an annual basis. Problems with creating this measure include determining which county is the child's "home county"

Figure 7

NAS Rates (Cases/1,000 Births) in the US, WV, and Kanawha County, 2014 - 2020

Year	US	WV	Kanawha County
2014	6.1	34.9	
2015	6.4	38.1	
2016	6.8	46.2	
2017	7.1	51.2	39.4
2018		49.6	39.0
2019		55.5	36.1
2020*			54.3

*January-June

Sources: <https://mchb.tvisdata.hrsa.gov/PrioritiesAndMeasures/NationalOutcomeMeasures>, Project WATCH, and WVDHHR

Note: Individual year figures differ between the text and table slightly due to different sources, as federal data is current only through 2017, and county data begins in 2017.

- 55 Dennis Thompson, "Opioid-Addicted Babies Cost U.S. More Than \$500 Million Annually," *US News and World Report*, December 16, 2019, [usnews.com/news/health-news/articles/2019-12-16/opioid-addicted-babies-cost-us-more-than-500-million-annually](https://www.usnews.com/news/health-news/articles/2019-12-16/opioid-addicted-babies-cost-us-more-than-500-million-annually) (accessed December 30, 2021).
- 56 Paul L. Morgan and Yangyang Wang, "The Opioid Epidemic, Neonatal Abstinence Syndrome, and Estimated Costs for Special Education Services," *American Journal of Managed Care*, 25, no. 13 (2019), [ajmc.s3.amazonaws.com/_media/_pdf/A904_05_2019_OpioidEpidemic_Article04.pdf](https://ajmc.s3.amazonaws.com/media/_pdf/A904_05_2019_OpioidEpidemic_Article04.pdf) (accessed December 30, 2020).
- 57 West Virginia Department of Education, "2018-2019 Year in Review," WV Department of Education, wvde.us/wp-content/uploads/2019/08/2018-19-YearInReview.pdf?utm_source=Superintendents+and+Board+2019&utm_campaign=893c41ee6c-EMAIL_CAMPAIGN_2019_08_16_07_50&utm_medium=email&utm_term=0_09f6fc1050-893c41ee6c-94104567 (accessed February 2, 2021).
- 58 Children's Bureau, "Foster Care Statistics 2018," Administration for Children and Families, childwelfare.gov/pubPDFs/foster.pdf#page=3&view=Children%20in,%20entering,%20and%20exiting%20care (accessed December 16, 2020).
- 59 Casey Family Programs, "State Fact Sheet WV," Casey Family Programs, caseyfamilypro-wpengine.netdna-ssl.com/media/state-data-sheet-WV.pdf (accessed December 16, 2020).
- 60 Hannah Rappleye and Brenda Breslauer, "'Love, over everything': As West Virginia struggles with foster care crisis, families step up," CBS News, January 21, 2020, [nbcnews.com/health/parenting/love-over-everything-west-virginia-struggles-foster-care-crisis-families-n1118851](https://www.nbcnews.com/health/parenting/love-over-everything-west-virginia-struggles-foster-care-crisis-families-n1118851) (accessed November 16, 2020).

and which children are considered to be in foster care when many are likely to move between facilities, kinship care, and foster homes in multiple counties over the course of a year. Because foster placements are not always immediately available, and because some children require mental health care services and support, some are placed into residential or mental health facilities either in or out of state. Treatment costs in facilities, particularly those out of state, are very high. Specifying the cost of the foster care system also raises considerations of how the related costs for child welfare, health care, and court costs are counted. In short, while the actual cost per foster child is thus far unattainable, there is widespread agreement among child welfare advocates familiar with WV's foster care system that the costs are ballooning with a dramatic increase in the number of children.⁶¹

Nevertheless, estimates of some segments of the foster care costs in WV and in Kanawha County merit consideration to understand their magnitude. For example, the state and federal administrative costs of placing a child in foster care — placement and monitoring — are approximately \$6,675 per child annually according to the Adoption Network Law Center.⁶² This narrow definition of costs applied only to 83 percent of new entrants into the WV foster system in 2018 produces an annual \$27,629,227 price tag. The Casey Foundation estimates that federal funding for foster care services in WV reached more than \$54,500,000 in 2018, or \$18,850 for each of the 2,892 children receiving federal foster care support. The National Council for Adoption estimates that nationwide, the foster care cost per child per year is \$25,782. Applying that cost figure to 83 percent of the over 7,000 children in WV foster care in 2018 places expenditures at more than \$150 million. To our knowledge, there are no calculations of the full cost of a foster placement, much less those related to drug overdose. Experts suggest that because as many as 20 times more children live with relatives outside the foster care system, any estimate would severely undercount the amount spent.⁶³

According to West Virginia Kids Count, of the 37,561 children under 18 years old in Kanawha County in 2018, 5 percent (1,878) were in foster care in the state.⁶⁴ Applying the 83 percent estimate of the number of those cases involving parents with SUDs yields a total of 1,559 children; using the conservative annual estimate of \$25,782 as the cost of caring for each child results in an annual cost of \$40,194,138 in Kanawha County alone. This is a sobering and significant expenditure of resources, even without considering the additional children living with relatives outside the foster care system.

Long-Term Health Considerations of People with SUDs

Especially for people who inject drugs (PWID), the costs are not simply those associated with their first hospitalizations (which are included in the aforementioned annual estimate based on the CEA methodology). As Florence et. al. noted, to know the full value of preventing SUDs requires calculating the associated health costs from the condition's start until its conclusion. Unfortunately, surveillance systems are not currently designed to measure all of these costs. However, by shedding some light on the lifetime costs of some of the illnesses frequently contracted by PWID, we hope to provide a fuller understanding of the potential health care costs of the burgeoning epidemic.

61 Personal correspondence, Kelli Caseman, Executive Director, Think Kids WV, January 6, 2021.

62 Adoption Network, US Adoption Statistics, Adoption Network, adoptionnetwork.com/adoption-statistics#:~:text=State%20and%20federal%20expenditures%20for,served%20per%20year%20was%20%246%2C675 (accessed December 16, 2020).

63 Lydia Anderson, "The Opioid Prescribing Rate and Grandparents Raising Grandchildren: State and County Level Analysis," US Census Bureau, [census.gov/content/dam/Census/library/working-papers/2019/demo/sehsd-wp2019-04-poster.pdf](https://www.census.gov/content/dam/Census/library/working-papers/2019/demo/sehsd-wp2019-04-poster.pdf) (accessed December 16, 2020).

64 WV Kids Count, "2020 State of Our Children Data Book," WV Kids Count, wvkidscount.org/wp-content/uploads/2020/10/KCDB2020Final.pdf (accessed January 6, 2021).

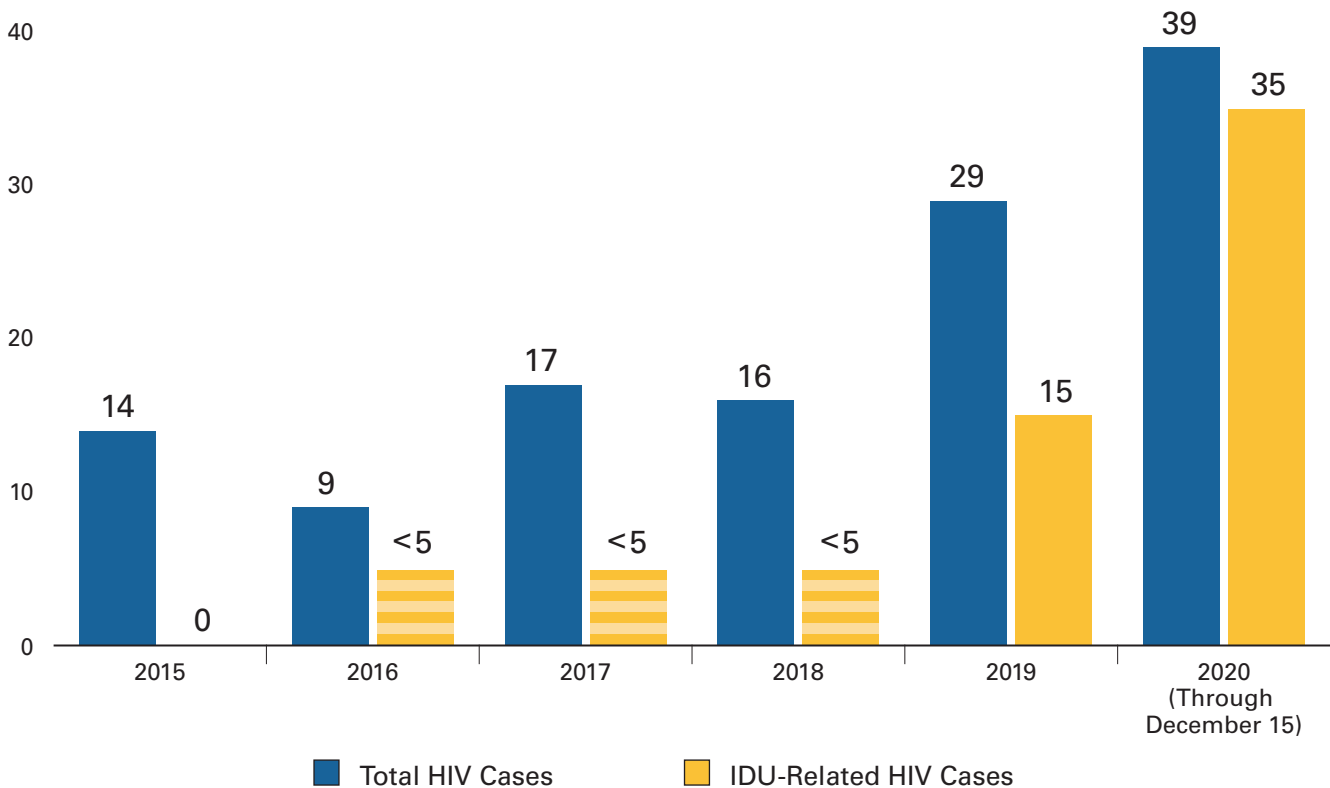
Human Immunodeficiency Virus (HIV)

HIV is a condition suffered by an increasing number of people who inject drugs without access to sterile equipment. WV does not typically rank high among states in the number of cases of HIV per 100,000 persons. In 2018, it ranked in 33rd place.⁶⁵ But the rise in cases associated with injection drug use (IDU), particularly in the last three years in the most populous counties, has raised state and county public health department concern. While Kanawha-Charleston Health Department's Dr. Sherri Young reports that Kanawha County used to witness an average of two new cases of HIV per year related to IDU, 2019 saw a massive spike, with 15 new IDU-related cases,⁶⁶ followed by an even larger spike of 35 new IDU-related HIV cases in 2020.⁶⁷ The new 2020 IDU-related HIV cases represent a 133 percent increase from 2019. At a February 2021 Kanawha County HIV Task Force meeting, Dr. Demetre Daskalakis, the head of HIV prevention for the U.S. Centers for Disease Control and Prevention (CDC), called this outbreak "the most concerning in the United States."⁶⁸

Figure 8

HIV Cases are Spiking in Kanawha County in 2019 and 2020

Number of total new HIV cases and new IDU-related HIV cases by year in Kanawha County, 2015 - 2020



Source: WVCPB analysis of West Virginia Department of Health and Human Resources data

65 MacKensie Bean, "States ranked by HIV diagnoses," Becker's Hospital Review, October 7, 2020, beckershospitalreview.com/rankings-and-ratings/states-ranked-by-hiv-diagnoses.html (accessed February 18, 2021).

66 Jake Flatley, "Health Officials Form HIV Task Force in Kanawha County," Metro News, October 8, 2019, www.metronews.com/2019/10/08/health-officials-form-hiv-task-force-in-kanawha-county/ (accessed January 11, 2021).

67 Shannon McBee, "HIV Outbreak in Kanawha County Associated with Injection Drug Use," presentation to the Kanawha County HIV Task Force meeting, February 11, 2021, uploaded from Scribd, [scribd.com/document/494227515/Kanawha-County-HIV-IDU-Increase-2019-2021-Feb-9-2021#download](https://www.scribd.com/document/494227515/Kanawha-County-HIV-IDU-Increase-2019-2021-Feb-9-2021#download) (accessed February 18, 2021).

68 Lauren Peace, "The CDC says Kanawha County's HIV outbreak is the most concerning in the United States," *Mountain State Spotlight*, February 11, 2021, <https://mountainstatespotlight.org/2021/02/11/the-cdc-says-kanawha-countys-hiv-outbreak-is-the-most-concerning-in-the-united-states/> (accessed February 18, 2021).

The CDC's estimate of the lifetime cost of treating an HIV case is nearly \$485,000.⁶⁹ To treat Kanawha County's 35 new cases for most of 2020 will cost nearly \$17 million. These costs are not borne by the health care industry alone but are also passed on in the form of elevated health insurance costs, increased hospital treatment costs, and an economy which suffers from a sicker workforce.

Hepatitis C (HCV)

According to the CDC, hepatitis C (HCV) is currently most commonly transmitted via sharing needles or other drug use equipment.⁷⁰ Chronic HCV can ultimately lead to cirrhosis of the liver, liver cancer, or liver failure. Given WV's high IDU rates, it is not surprising that it ranks high nationally in acute HCV cases as well. Between 2014 and 2019, WV had either the highest or second-highest rate of acute HCV cases per 100,000 residents in the United States.⁷¹ In 2019, WV's rate was 5.8 per 100,000.⁷² Because approximately 75 percent of acute HCV cases become chronic, it is easy to see that WV's burden of chronic HCV is staggering.

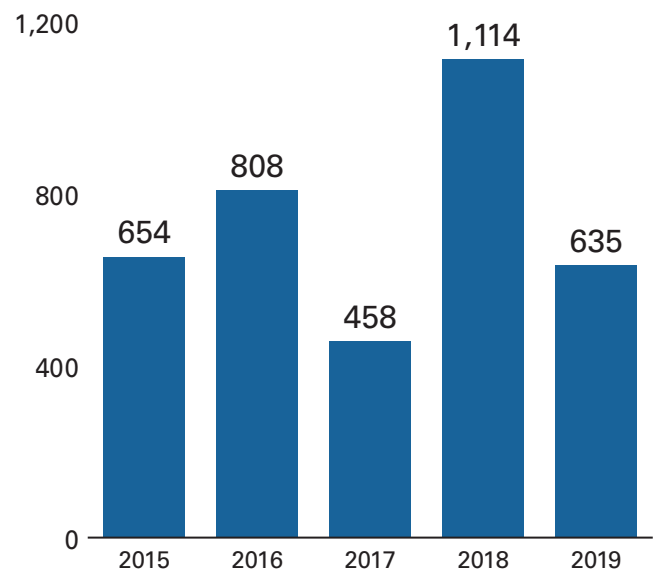
Figure 9 identifies the number of chronic HCV cases recorded in Kanawha County in recent years. A Kanawha-Charleston Health Department-based syringe services program (SSP) operated between late 2015 and early 2018. In 2016, the number of HCV cases rose over the previous year. This is often the case when SSPs are first introduced as more testing leads to greater detection. The marked decline in cases in 2017 may have resulted from the program. Likewise, the rise in 2018 may be the result of the program's cancellation early in that year. While the 2019 figure is an improvement over the previous year, it still represents a 38 percent rise since the final full year of the SSP. Based on the 2018 and 2019 total number of new cases, approximately 1 percent of Kanawha County's population recently received a new diagnosis of chronic HCV.

Curative treatment is now available for HCV. The current costs for antiviral treatments range from \$26,400 to \$94,800, with an average of about \$70,000.⁷³ Using the average cost figure, treating the new Kanawha County chronic HCV cases in 2019 would cost \$44.5 million.

Figure 9

Changing Number of Chronic HCV Cases in Kanawha County over Time

New HCV cases by year, Kanawha County, 2015 - 2019



Source: WVCBP analysis of West Virginia Department of Health and Human Resources Data

69 Centers for Disease Control and Protection, "CDC's HIV Work Saves Lives and Money," Centers for Disease Control and Protection, [cdc.gov/nchhstp/budget/infographics/hiv.html](https://www.cdc.gov/nchhstp/budget/infographics/hiv.html) (accessed November 12, 2020).

70 Centers for Disease Control and Protection, "Viral Hepatitis," Centers for Disease Control and Protection, [cdc.gov/hepatitis/hcv/index.htm](https://www.cdc.gov/hepatitis/hcv/index.htm) (accessed November 12, 2020).

71 Center for Disease Control and Protection, "Viral Hepatitis Surveillance Report 2018 — Hepatitis C," Center for Disease Control and Protection, [cdc.gov/hepatitis/statistics/2018surveillance/HepC.htm#Figure3.2](https://www.cdc.gov/hepatitis/statistics/2018surveillance/HepC.htm#Figure3.2) (accessed January 11, 2021).

72 West Virginia Office of Epidemiology and Prevention Services, The West Virginia Electronic Disease Surveillance System (WVEDSS), The Number of Cases and Rate of Acute and Chronic Hepatitis C(HCV) in West Virginia, 2019, downloaded February 11, 2021.

73 Susan York Morris, "How Much Does Treatment for Hepatitis C Cost?," *Healthline*, July 2, 2020, [healthline.com/health/hepatitis-c-treatment-cost](https://www.healthline.com/health/hepatitis-c-treatment-cost) (accessed February 18, 2021).

Hepatitis B (HBV)

A less-commonly recognized illness associated with IDU is hepatitis B (HBV). The prevalence of this condition is less well defined than others. Like HCV, the adverse health outcomes and costs are primarily related to those individuals who go on to develop chronic HBV, but unlike HCV, this is a minority of about 12 percent. Chronic HBV results in liver damage, with the same potential outcomes described for HCV above. While HBV is preventable by vaccination, most people born before 1991 (when babies started receiving their first HBV vaccine dose at birth) are not immune. For the last 10 years, WV has had the highest rate of acute HBV in the nation, guaranteeing that WV will have a significant burden of chronic HBV as well.⁷⁴

As mentioned above, a safe, effective vaccine exists for HBV. In 1991, the CDC's Advisory Committee on Immunization Practices (ACIP) recommended that the vaccine be administered at birth in the hospital or at age one to two months to eliminate HBV transmission in the United States, but has not yet called for universal coverage of individuals of all ages.⁷⁵ Unlike chronic HCV, HBV is not yet curable and for those who require treatment, medication is taken indefinitely to control the virus, as is done for HIV.

In 2016, the CDC reported an emerging epidemic of HBV in Kentucky, Tennessee, and West Virginia. Between 2009–2013, the incidence of acute HBV cases increased 114 percent in these states, but was virtually unchanged in the rest of the US. The proportion of cases involving IDU grew from 53 percent in 2006–2009 to 75 percent in 2010–2013. The report concluded, "A hepatitis B epidemic is emerging in Kentucky, Tennessee, and West Virginia. The increase in incident HBV-infections might contribute to future increases in liver-related morbidity and mortality."⁷⁶

WV Bureau for Public Health reports in 2017 and 2018 provide more specific data for the state and counties. IDU is the most commonly-reported risk factor (38 percent) for acute HBV according to the state's 2016 Surveillance Survey.⁷⁷ In 2018, Kanawha County announced 38 newly-reported chronic HBV cases at a rate of 20.2 per 100,000, almost three times the state rate of 7.2 per 100,000.⁷⁸ This is particularly notable given that the state rate is more than seven times the national rate of 1 per 100,000.⁷⁹

If only 38 percent of these cases (or 14 individuals) are associated with IDU as the WV Bureau of Public Health reported, and the national average of 25 percent mortality from HBV is applied to those cases, the lifetime cost of treatment would apply to about four additional Kanawha County residents in 2018. There is no widely accepted dollar amount for this cost. From a recent study measuring the cost-effectiveness of chronic HBV diagnosis, care, and treatment, we estimate that the cost is about \$49,000.⁸⁰ That places the

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- 74 Jim Justice, Bill J. Crouch, and Rahul Gupta, "West Virginia Viral Hepatitis Epidemiologic Profile 2017," WV Department of Health and Human Resources. dhhr.wv.gov/oeps/disease/ob/documents/viral-hep-profile-2017.pdf (accessed January 13, 2021).
- 75 Centers for Disease Control and Prevention, "Newborn Hepatitis B Vaccination Coverage Among Children Born January 2003 – June 2005 – United States," *Morbidity and Mortality Weekly Report* 57 no. 30 (August 1, 2008), [cdc.gov/mmwr/preview/mmwrhtml/mm5730a3.htm#:~:text=Hepatitis%20B%20vaccine%20was%20first,the%20United%20States%20\(1](https://www.cdc.gov/mmwr/preview/mmwrhtml/mm5730a3.htm#:~:text=Hepatitis%20B%20vaccine%20was%20first,the%20United%20States%20(1) (accessed January 14, 2021).
- 76 Aaron M. Harris, et al., "Increases in Acute Hepatitis B Virus Infections — Kentucky, Tennessee, and West Virginia, 2006–2013," *Morbidity and Mortality Weekly Report* 65, no. 3 (January 29, 2016), [cdc.gov/mmwr/volumes/65/wr/mm6503a2.htm](https://www.cdc.gov/mmwr/volumes/65/wr/mm6503a2.htm) (accessed December 11, 2020).
- 77 Jim Justice, Bill J. Crouch, and Rahul Gupta, "West Virginia Viral Hepatitis Epidemiologic Profile 2017," WV Department of Health and Human Resources, p. 7, dhhr.wv.gov/oeps/disease/ob/documents/viral-hep-profile-2017.pdf (accessed January 13, 2021).
- 78 West Virginia Department of Health and Human Resources, "2018 Hepatitis B Tables," West Virginia Department of Health and Human Resources, <https://www.dropbox.com/s/brdhqwdztx7vgiw/2018%20Hepatitis%20tables%20%281%29%20%281%29%20%281%29.pdf?dl=0>.
- 79 Centers for Disease Control and Prevention, "Viral Hepatitis Surveillance Report 2018 — Hepatitis B," Centers for Disease Control and Prevention, [cdc.gov/hepatitis/statistics/2018surveillance/HepB.htm](https://www.cdc.gov/hepatitis/statistics/2018surveillance/HepB.htm) (accessed February 19, 2021).
- 80 BL Strom BL and GJ Buckley, eds, *A National Strategy for the Elimination of Hepatitis B and C: Phase Two Report* (Washington, DC: National Academies Press; March 28, 2017), [ncbi.nlm.nih.gov/books/NBK442231/](https://www.ncbi.nlm.nih.gov/books/NBK442231/) (accessed January 14, 2021).

additional medical costs initiated in 2018, very conservatively estimated, at \$196,000. This is a relatively small amount in comparison to others discussed in this report, but it is a cost that could be avoided by regular HBV screening and vaccinations for drug users at a price of only about \$62 per adult.⁸¹

Infective Endocarditis (IE)

Another disease increasingly tied to IDU is infective endocarditis (IE), an infection of the lining of the heart, especially the valves that control the flow of blood in and out of the heart. Studies have reported an in-hospital mortality rate of 15 percent to 20 percent and one-year mortality rate of 40 percent.⁸² IE cases associated with IDU have nearly doubled nationally in the 14 years between 2002 and 2016.⁸³ The long-term survival rates for PWID are low if they continue IDU because valves previously damaged by IE or valves that have to be replaced surgically are at increased risk of recurrent infection.⁸⁴ Researchers have recently determined that by 2030, approximately 257,800 people will die from IE.⁸⁵

Although there are no nationally published data on the geographic distribution of IE, three of the major studies are located in the Appalachian region.⁸⁶ The most relevant to our study is an investigation of 462 patients hospitalized with IE and concomitant illicit drug use between 2008 and 2015 at the Charleston Area Medical Center (CAMC) in Kanawha County. The hospital receives patients from all over southern WV. Recent data in Figure 10 below shows that between 2016 and 2019, CAMC had reported 317 cases of IE in which the patients also had a substance use disorder.⁸⁷ IE cases increased 154 percent over that time period with an average of 79.3 cases per year versus just 57.8 cases per year from 2008 to 2015.

81 Centers for Disease Control and Prevention, “Vaccines for Children Program (VFC),” Centers for Disease Control and Prevention, cdc.gov/vaccines/programs/vfc/awardees/vaccine-management/price-list/index.html (accessed January 14, 2021).

82 Grace Rattue, “Patients With Infective Endocarditis And Heart Failure Have Reduced Mortality With Valvular Surgery,” *Medical News Today*, November 24, 2011, medicalnewstoday.com/articles/238212#1 (accessed January 14, 2021).

83 Amer N. Kadri et al., Geographic Trends, Patient Characteristics, and Outcomes of Infective Endocarditis Associated With Drug Abuse in the United States From 2002 to 2016, *Journal of the American Heart Association* 8, no. 19 (September 2019), ahajournals.org/doi/10.1161/JAHA.119.012969 (accessed December 9, 2020).

84 Sam Straw et al., “Long-term Outcomes Are Poor in Intravenous Drug Users Following Infective Endocarditis, Even After Surgery,” *Clinical Infectious Diseases* 71, no. 3 (August 2020), academic.oup.com/cid/article/71/3/564/5558411 (accessed January 14, 2021).

85 Bradley van Paridon, “Long-Term Infective Endocarditis Mortality Risk Among Injection Drug Users,” *Infectious Disease Advisor* October 2, 2020, infectiousdiseaseadvisor.com/home/topics/prevention/long-term-infective-endocarditis-mortality-risk-among-injection-drug-users/ (accessed January 14, 2021).

86 See Mark Bates et al., Increasing Incidence of IV-Drug Use Associated Endocarditis in Southern West Virginia and Potential Economic Impact, *Clinical Cardiology* 42, no. 4 (April 2019), ncbi.nlm.nih.gov/pmc/articles/PMC6482850/ (accessed December 1, 2020), Victor A. Ferrais and Michael E. Sekela, “Missing the Forest for the Trees: The World around Us and Surgical Treatment of Endocarditis,” *The Journal of Thoracic and Cardiovascular Surgery* 152, no. 3 (September 2016), sciencedirect.com/science/article/pii/S0022522316303221 (accessed December 1, 2020), Megan Sredl et al., “Not Just Endocarditis: Hospitalizations for Selected Invasive Infections Among Persons With Opioid and Stimulant Use Diagnoses—North Carolina, 2010–2018,” *The Journal of Infectious Diseases* 222, No. Supplement 5 (October 2020), academic.oup.com/jid/article-abstract/222/Supplement_5/S458/5900582 (accessed January 14, 2021), and Praveen Gundelly et al., “912 Prevalence of Hepatitis C Infection and Epidemiology of Infective Endocarditis in Intravenous Drug Users in Central Kentucky,” *Open Forum Infectious Diseases*, 1, Suppl 1 (December 2014), ncbi.nlm.nih.gov/pmc/articles/PMC5782306/ (accessed January 14, 2021).

87 Personal correspondence, Frank Annie, Research Scientist, Charleston Area Medical Center, January 7 and 8, 2021.

Figure 10

Infective Endocarditis Cases with Illicit Drug Use Reported, CAMC, 2016 - 2019

Year	CAMC Cases	Estimated Cost (at ~\$54,000/ case)	Kanawha County Residents' Share of CAMC Cases	Estimated Cost of Kanawha County Cases
2016	54	\$2.9 million	42	\$2.3 million
2017	110	\$5.9 million	68	\$3.7 million
2018	76	\$4.1 million	36	\$1.9 million
2019	77	\$4.2 million	28	\$1.5 million
Averages	79	\$4.3 million	44	\$2.4 million

Source: Personal correspondence, Frank Annie, Research Scientist, CMAC, January 7, 2021 and January 8, 2021.

A major concern from the perspective of the CAMC administration is that only 22 percent of the more than \$17 million in hospital charges for the 462 cases was collected, as people with SUDs are frequently under- or uninsured.⁸⁸ Using a recently published median cost of \$54,281 for IE treatment in North Carolina,⁸⁹ we calculated the average cost for CAMC and Kanawha County cases over the period using the average number of cases from 2016 to 2019. These are shown in Figure 10 above. It is again sobering that the average annual costs for all CAMC IE patients with SUDs amount to \$4.3 million. If recovery of hospital charges continues at just 22 percent of the total charges for these cases, then \$3.35 million (\$4.3 million x .78) of the bills will remain unpaid, and if CAMC were only required to absorb the cost of Kanawha County residents, the shortfall would still be more than \$1.8 million annually. While the lifetime cost of treating PWID with IE might be a more useful number in estimating the cost burden of this condition, no such estimate is publicly available.

88 Mark Bates et al., Increasing Incidence of IV-Drug Use Associated Endocarditis in Southern West Virginia and Potential Economic Impact, *Clinical Cardiology* 42, no. 4 (April 2019), ncbi.nlm.nih.gov/pmc/articles/PMC6482850/ (accessed December 1, 2020).

89 Aaron T. Fleischauer, "Hospitalizations for Endocarditis and Associated Health Care Costs Among Persons with Diagnosed Drug Dependence — North Carolina, 2010–2015," *Morbidity and Mortality Weekly Report* 66, no. 22 (June 9, 2017) / 66(22), cdc.gov/mmwr/volumes/66/wr/mm6622a1.htm (accessed January 15, 2021).

PART IV

Harm Reduction: How to Reduce Drug Epidemic Costs

According to the National Harm Reduction Coalition:

Harm reduction incorporates a spectrum of strategies that includes safer use, managed use, abstinence, meeting people who use drugs “where they’re at,” and addressing conditions of use along with the use itself. Because harm reduction demands that interventions and policies designed to serve people who use drugs reflect specific individual and community needs, there is no universal definition of or formula for implementing harm reduction.⁹⁰

The range of services available in harm reduction programs vary widely. A typical range of services includes syringe services programs (SSPs), education about the importance of techniques for safer injection, and overdose prevention and response (primarily naloxone education and distribution). Harm reduction programs may also offer testing for HIV, HCV, and other health conditions described above. Some provide referrals for mental health and/or SUD counseling and support groups; and some offer services through programs for pregnant women with SUDs, law enforcement-assisted diversion (LEAD) programs, and medication-assisted treatment (MAT) programs.⁹¹ In other countries, overdose prevention centers (also known as safer injection facilities) are a form of harm reduction.⁹²

There are numerous influences of harm reduction programs on an individual or family. For the purposes of this study, three impacts bear close scrutiny for their effects on the broader community. First, harm reduction reduces the number of drug overdose fatalities which, in turn, reduces the billions of dollars in lost production and wages described in Part 2 above. Second, harm reduction, in particular syringe services programs, have a major impact on the spread of communicable diseases (e.g, HIV and hepatitis) and the incidence of other long-term medical conditions and their ongoing costs. Third, there is some evidence that reduction in crime and other societal impacts — and thus, their associated costs — have accompanied harm reduction programs.

We will consider only four of the many harm reduction programs in use around the world today: distribution of the opioid overdose reversal drug, naloxone; syringe services programs in which PWID are given clean needles; medication-assisted treatment programs; and supervised consumption facilities. Some of these programs overlap. For example, syringe services programs often distribute naloxone free of charge. However, they represent four promising methods to attack the fatal and non-fatal costs of drug use and misuse. When possible, we highlight the costs of current harm reduction programs. Like many other data points useful for weighing the costs and benefits of managing the drug epidemic, these are not always readily available.

90 National Harm Reduction Coalition, “Principles of Harm Reduction,” National Harm Reduction Coalition, harmreduction.org/about-us/principles-of-harm-reduction/ (accessed February 16, 2021).

91 Because the ultimate goal of MAT is full recovery from substance use, most experts do not consider it as harm reduction which does not have recovery as its goal. However, we include it in this section because MAT can reduce HIV, HCV, and other health consequences of injection drug use. See Substance Abuse and Mental Health Services Administration (SAMHSA), “Medication-Assisted Treatment (MAT), SAMHSA, <https://www.samhsa.gov/medication-assisted-treatment> (accessed February 18, 2021).

92 Law Enforcement Action Partnership, “Harm Reduction,” Law Enforcement Action Partnership, lawenforcementactionpartnership.org/our-issues/harm-reduction/ (accessed January 25, 2021).

Dollars Saved by Lives Saved through Harm Reduction

Naloxone Distribution

Perhaps the most effective direct measure in combating overdose deaths is the use of naloxone. This FDA-approved generic drug is designed to reverse an opioid overdose by restoring an unconscious overdose victim's breathing. Between 2017 and 2018, the number of naloxone prescriptions issued increased 106 percent to 556,000 prescriptions. In addition, the CDC reports that between 1996 and 2014, government-provided naloxone administrations by trained community members alone saved 25,000 lives.⁹³ A 2018 study using qualitative data and modeling to simulate community distribution strategies estimates that giving up to 10 naloxone kits to a client reduces overdose deaths by 8.3 percent, and allowing the client to distribute kits to their social circle may decrease overdose deaths by 42.5 percent. Naloxone distribution at syringe exchange sites may decrease deaths by as much as 65 percent.⁹⁴ Compared to the billions of dollars lost attributed to overdose deaths described in Part 2, a single dose of generic naloxone costs between \$20 and \$40.⁹⁵ Even without accurate figures on the number of lives saved, it is not surprising that the CDC promoted expanded naloxone distribution as a primary way of "sustaining and expanding preliminary successes in reducing opioid-involved overdose death" in its 2020 report on the decline in overdose deaths between 2017 and 2018.⁹⁶

In both WV and Kanawha County, naloxone administrations have increased in recent years. WV's Office of Drug Control Policy (ODCP) reports that emergency medical services (EMS) administered approximately 5,563 naloxone doses statewide in 2019, of which 1,449 occurred in Kanawha County.⁹⁷ ODCP also collects pre-EMS naloxone interventions by police, fire departments, and lay public on a voluntary basis. It notes that these numbers are very low estimates given that naloxone administered by companions of overdose victims are frequently not recorded. Whereas state figures record 21 doses given before EMS arrival in Kanawha County in 2019, the non-profit Solutions Oriented Addiction Response (SOAR) reports that it distributed approximately 6,687 doses in the county in 2020. A November 2018 study asserts that among PWID in West Virginia, slightly less than half received take-home naloxone in the past six months.⁹⁸ But still we do not fully understand how effective naloxone use and distribution is here. The data collected by SOAR, received from repeat clients in the Charleston area who were willing to provide feedback, suggests that about 10 percent of the naloxone they distribute results in a reported overdose reversal.⁹⁹ Since April 1, 2020, SOAR reports they have recorded 704 community opioid overdose reversals from their participants.¹⁰⁰

93 Drug Policy Alliance, "Naloxone," Drug Policy Alliance, drugpolicy.org/issues/naloxone (accessed January 25, 2021).

94 LDI/CHERISH, "Expanding Access to Naloxone: A Review of Distribution Strategies," University of Pennsylvania, ldi.upenn.edu/brief/expanding-access-naloxone-review-distribution-strategies (accessed January 25, 2021).

95 Abigail Abrams, "The Surgeon General Says More People Should Carry Naloxone, the Opioid Antidote. Here's Where to Get It and How Much It Costs," *Time*, April 5, 2018, time.com/5229870/naloxone-surgeon-general-cost-where-buy/ (accessed January 25, 2021).

96 Centers for Disease Control and Prevention, "New Data Show Significant Changes in Drug Overdose Deaths," Centers for Disease Control and Prevention, [cdc.gov/media/releases/2020/p0318-data-show-changes-overdose-deaths.html](https://www.cdc.gov/media/releases/2020/p0318-data-show-changes-overdose-deaths.html) (accessed January 25, 2021).

97 West Virginia Office of Drug Control Policy "Naloxone Given in 2019," West Virginia Department of Health and Human Resources, dhhr.wv.gov/office-of-drug-control-policy/datadashboard/Pages/default.aspx (accessed January 27, 2021).

98 Sean T. Allen et al., "Take-home naloxone possession among people who inject drugs in rural West Virginia," *Drug and Alcohol Dependence*, 204, no. 107581 (November 2019), [sciencedirect.com/science/article/abs/pii/S0376871619303588](https://www.sciencedirect.com/science/article/abs/pii/S0376871619303588) (accessed January 27, 2021).

99 Personal correspondence, Joe Solomon, Solutions Oriented Addiction Response, January 30, 2021.

100 Joe Solomon, Solutions Oriented Addiction Response, Facebook post (February 24, 2021), <https://www.facebook.com/soarwv/posts/545224139705436> (accessed February 26, 2021).

Syringe Services Programs (SSPs)

Succinctly put by the CDC in 2019:

Nearly 30 years of research has shown that comprehensive SSPs are safe, effective, and cost-saving, do not increase illegal drug use or crime, and play an important role in reducing the transmission of viral hepatitis, HIV and other infections. Research shows that new users of SSPs are five times more likely to enter drug treatment and about three times more likely to stop using drugs than those who don't use the programs. SSPs that provide naloxone also help decrease opioid overdose deaths. SSPs protect the public and first responders by facilitating the safe disposal of used needles and syringes.¹⁰¹

Understanding just how large these impacts are in terms of cost savings is challenging. Since some of the earliest studies on this topic, researchers have found that viral infections in PWID decline markedly when SSPs are available. In 1995, Seattle public health officials reported that after adjusting for demographics and duration of drug use, individuals who did not use the area's SSP had a six-fold and a seven-fold greater risk of contracting HBV and HCV respectively.¹⁰² On a national level, research indicates that reductions of almost 50 percent in HIV and HCV are associated with SSPs, which is why the federal government has made this a key 2020 strategy in its five-year plan to decrease new HIV cases by 75 percent.¹⁰³ Because infective endocarditis (IE) is a bacterial infection also increasingly linked to injection drug use, it stands to reason that sterile needles provided by SSPs can also reduce the high costs of hospitalization and mortality associated with the condition. Public health researchers have argued that because increasing IE cases are an early warning sign for HIV and HCV, such cases "could be targeted as a priority area for the development, authorization, and implementation of evidence-based substance use disorder treatment programs and harm reduction packages" such as SSPs.¹⁰⁴

There are currently 14 county-based harm reduction programs and two private clinic-run programs delivering SSPs in WV. Between December 2015 and March 2018, the Kanawha-Charleston Health Department (KCHD) administered a syringe services program that supplied sterile needles to people who inject drugs. During the final full year of this harm reduction program, 2017, 458 chronic HCV cases were diagnosed. This was the lowest number seen since 2012, and reported cases have not declined to that level since. A qualitative study of clients of the KCHD program after its closure points to the increased risks for HIV/HCV acquisition and overdose among PWID, all of which have been borne out by data discussed above.¹⁰⁵

The cost of operating a comprehensive SSP in Kanawha County today is likely comparable to one privately operated by the Milan Puskar Health Right in Morgantown (Monongalia County), WV. Morgantown has about two-thirds the population of Charleston, and Monongalia County has approximately half the population of Kanawha County. But Milan Puskar Health Right, a free community-supported and charitable clinic, operates an SSP that attracts 1,600 (unduplicated) people from 17 different northcentral WV counties in a year. The program costs almost \$190,000, including two full-time staff members who also provide other harm reduction services and some physical and mental health care to SSP clients. There are two part-time paid staff — a social worker and a medical assistant — and many volunteers who offer one-on-one harm reduction

101 Centers for Disease Control and Prevention, "Summary of Information on The Safety and Effectiveness of Syringe Services Programs (SSPs)," Centers for Disease Control and Prevention, cdc.gov/ssp/syringe-services-programs-summary.html (accessed January 27, 2021).

102 H. Hagan et al., "Reduced risk of hepatitis B and hepatitis C among injection drug users in the Tacoma syringe exchange program," *American Journal of Public Health* (November 1995), ajph.aphapublications.org/doi/abs/10.2105/AJPH.85.11.1531 (accessed January 27, 2021).

103 HIV.gov, "Syringe Services Programs," US Department of Health and Human Services, hiv.gov/federal-response/policies-issues/syringe-services-programs (accessed January 27, 2021).

104 Megan Gray et al., "Rising Rates of Injection Drug Use Associated Infective Endocarditis in Virginia with Missed Opportunities for Addiction Treatment Referral: A Retrospective Cohort Study," *BMC Infectious Diseases*, 18, no. 532 (2018), bmcinfectdis.biomedcentral.com/articles/10.1186/s12879-018-3408-y (accessed January 28, 2021).

105 Sean T. Allen et al., "Understanding the public health consequences of suspending a rural syringe services program: a qualitative study of the experiences of people who inject drugs," *Harm Reduction Journal* 16, no. 33 (2019), harmreductionjournal.biomedcentral.com/track/pdf/10.1186/s12954-019-0305-7.pdf (accessed January 29, 2021).

assistance to each person who comes to the program. It distributes approximately 420,000 syringes free of charge in a single year and pays up to \$8,000 for hazardous waste disposal of used syringes. Recalling that the lifetime cost of HIV treatment is \$485,000 and the curative cost of HCV treatment is \$70,000, it is hard to fathom that this program doesn't pay for itself many times over in the course of a year.¹⁰⁶

Medication-Assisted Treatment (MAT)

Widely considered to be the most effective intervention to treat opioid use disorder in WV, MAT uses medications together with counseling and other psychosocial support. The three Federal Drug Administration-approved drugs for opioid dependence are buprenorphine, methadone, and naltrexone.¹⁰⁷ A 2018 review of the literature on the effectiveness of MATs concludes:

Numerous studies have demonstrated MAT's efficacy in retaining people in treatment and demonstrating significant reductions in the biopsychosocial symptoms of addiction that include risk for overdose, death, HIV and Hepatitis C due to intravenous drug use, cravings and withdrawal symptoms, incarceration, unemployment, family dissolution, exposure to trauma, and Child Protective Services' involvement in the family.¹⁰⁸

Although the subject of the cost-effectiveness of these programs is understudied, analyses typically point to positive results. For example, a Vermont study using five years of data to compare the treatment and medical service costs of a cohort of people who use opioids enrolled in MAT with a similar cohort not enrolled in MAT suggests that the former group had reduced health care expenditures and utilization.¹⁰⁹ A second study in California found, on average, a 30 percent decrease in medical costs associated with emergency room visits and hospital stays in a three-year post-treatment period.¹¹⁰

A significant obstacle to the use of MAT is the number of health care professionals qualified to administer buprenorphine. Only about 91,000 physicians, nurse practitioners, and physician assistants nationwide are trained and certified with the license known as the "X-waiver" needed to prescribe the drug. The American Medical Association has estimated that more than two million Americans need treatment for opioid use disorder, but few have access to quality care. In its last days, the Trump administration issued a more flexible policy allowing any physician with a Drug Enforcement Administration prescriber license to treat up to 30 in-state patients with buprenorphine, dramatically expanding the potential availability of treatment.¹¹¹ The Biden administration blocked the plan, at least temporarily, citing legal and operational problems. However, it reports that it is revising guidelines to increase access to buprenorphine soon.¹¹²

106 Personal correspondence, Laura Jones, Executive Director, Milan Puskar Health Right, January 28, 2021 and February 1, 2021.

107 Pew Charitable Trusts, "Medication-Assisted Treatment Improves Outcomes for Patients With Opioid Use Disorder," Pew Charitable Trusts, [pewtrusts.org/en/research-and-analysis/fact-sheets/2016/11/medication-assisted-treatment-improves-outcomes-for-patients-with-opioid-use-disorder#:~:text=Medication%2Dassisted%20treatment%20\(MAT\),behavioral%20interventions%20or%20medication%20alone](https://www.pewtrusts.org/en/research-and-analysis/fact-sheets/2016/11/medication-assisted-treatment-improves-outcomes-for-patients-with-opioid-use-disorder#:~:text=Medication%2Dassisted%20treatment%20(MAT),behavioral%20interventions%20or%20medication%20alone) (accessed February 3, 2021).

108 Kimberly Anne White, "Exploring the Perspectives and Experiences of Physicians in WV who Prescribe Medication Assisted Treatment (MAT) to Patients with Opioid use Disorder (OUD)," (EdD diss., Marshall University, 2018), p. 30, mds.marshall.edu/cgi/viewcontent.cgi?article=2164&context=etd (accessed February 2, 2021).

109 Mary Kate Mohlman et al., "Impact of Medication-Assisted Treatment for Opioid Addiction on Medicaid Expenditures and Health Services Utilization Rates in Vermont," *Journal of Substance Abuse Treatment* 67 (AUGUST 01, 2016), [journalofsubstanceabusetreatment.com/article/S0740-5472\(15\)30065-9/fulltext](https://journalofsubstanceabusetreatment.com/article/S0740-5472(15)30065-9/fulltext) (accessed January 28, 2021).

110 Martha Hostetter and Sarah Klein, "In Focus: Expanding Access to Addiction Treatment Through Primary Care," The Commonwealth Foundation, commonwealthfund.org/publications/2017/sep/focus-expanding-access-addiction-treatment-through-primary-care (accessed January 28, 2021).

111 Lev Facher, "Trump Administration Will Let Nearly All Doctors Prescribe Addiction Medicine Buprenorphine," Stat, January 14, 2021, [statnews.com/2021/01/14/trump-admin-nearly-all-doctors-buprenorphine/](https://www.statnews.com/2021/01/14/trump-admin-nearly-all-doctors-buprenorphine/) (accessed February 3, 2021).

112 Dan Diamond, "Biden Kills Trump Administration Plan on Opioid-Treatment Prescriptions Hailed by Physicians," Washington Post, January 28, 2021, [inquirer.com/politics/nation/joe-biden-opioid-treatment-x-waiver-stops-trump-order-20210128.html](https://www.washingtonpost.com/politics/nation/joe-biden-opioid-treatment-x-waiver-stops-trump-order-20210128.html) (accessed February 16, 2021).

According to a 2018 WV Department of Health and Human Resources white paper, only 1.3 percent of physicians with X-waivers practiced in small and remote rural counties. Further, certified providers had very few patients, with half having five or less, and less than one-third of physicians with waivers reported actively prescribing buprenorphine.¹¹³ Additional barriers to this treatment in WV also exist. A widely-recognized obstacle is that physician practices that may want to provide the medication to patients may not have licensed counselors to whom to send their patients. Other difficulties uncovered by a comprehensive review of MAT in WV include cost considerations of insurance policy restrictions, low reimbursement for physician services, and logistical challenges and cost issues related to staffing and use of electronic medical records, especially in rural areas. That doctors have developed preconceived notions about the complicated and time-consuming needs of people seeking treatment, that they may feel underprepared to manage the administration of medications, and that they often believe that medication will not work are serious hurdles requiring physician education.¹¹⁴

To increase access to MAT, West Virginia is using multiple national best practice models, such as ECHO (New Mexico) and Hub and Spoke (Vermont), in numerous locations. In 2017, it established the WV Project ECHO Substance Use Disorder in which five regional hubs treat patients and provide outreach in the form of training and mentoring 13 local health care facilities or “spokes.” A 2019 publication on preliminary results finds that 14 health care facilities initiated buprenorphine use, 56 health care professionals were trained, and 196 patients with opioid use disorders received treatment. The authors note that research on whether the program significantly improves buprenorphine treatment capacity and reduces the stigmas associated with MAT have yet to be seen.¹¹⁵

Supervised Consumption Facilities (SCFs)

Another immediate intervention aimed at reducing fatal overdoses is the use of supervised consumption facilities (SCFs), also called overdose prevention centers, in which drug users are monitored by health care professionals in facilities where sterile syringes are available, and which offer access to education and substance abuse treatment. There are 120 SCFs worldwide, but none in the US.¹¹⁶ Estimates published by Larson et al. show fatal overdoses averted by the centers include a 50 percent decline over 17 years in Spain and a 35 percent decline in deaths within one-third of a mile of the SCF in Vancouver, BC within two years of its opening.¹¹⁷

Studies typically show that the value of running SCFs heavily outweighs the costs, whether measured in the value of lives lost or the emergency medical services (EMS) use averted. A recent report on the SCF operating in Calgary, Canada estimated overall cost savings between 2017 and 2020 of \$2,364,876 as a result of overdoses managed at the center rather than by EMS.¹¹⁸ Using two different simulation models developed to determine the potential impact of a SCF in Philadelphia, Larson et al. estimated that annual overdose fatalities could fall by between 24 and 76. They calculated the value of the lives saved at between \$12,462,213 and \$74,773,276.

113 Rebecca Roth, “Medication Assisted Treatment: An Evidence-based Pathway to Recovery in West Virginia,” West Virginia Department of Health and Human Resources, dhhr.wv.gov/bhbf/Documents/MAT%202017/Medication%20Assisted%20Treatment%20white%20paper%207.5.18.pdf (accessed February 3, 2021).

114 Kimberly Anne White, “Exploring the Perspectives and Experiences of Physicians in WV who Prescribe Medication Assisted Treatment (MAT) to Patients with Opioid use Disorder (OUD),” (EdD diss., Marshall University, 2018), p. 24-25, mds.marshall.edu/cgi/viewcontent.cgi?article=2164&context=etd (accessed February 2, 2021).

115 Erin L. Winstanley et al., “West Virginia’s model of buprenorphine expansion: Preliminary results,” *Journal of Substance Abuse Treatment* Vol. 108 (January 2020), [journalofsubstanceabusetreatment.com/article/S0740-5472\(19\)30059-5/pdf#secst0010](https://journalofsubstanceabusetreatment.com/article/S0740-5472(19)30059-5/pdf#secst0010) (accessed January 29, 2021).

116 Drug Policy Alliance, “Supervised Consumption Services,” Drug Policy Alliance, drugpolicy.org/issues/supervised-consumption-services (accessed January 26, 2021).

117 Sharon Larson et al., “Supervised Consumption Facilities — Review of the Evidence,” Thomas Jefferson University, dbhids.org/wp-content/uploads/2018/01/OTF_LarsonS_PHLReportOnSCF_Dec2017.pdf (accessed January 26, 2021).

118 Jennifer Jackson, “A Cost Analysis of Overdose Management at a Supervised Consumption Site in Calgary, Canada,” *Qeios*, June 9, 2020, qeios.com/read/J6MQ0E (accessed January 26, 2021).

While there are no SCFs in WV, the severity of the fatal overdose problem in the state's rural communities caused O'Rourke et al. to survey PWID in Cabell County, WV about their willingness to use a SCF if it was available. Nearly 80 percent of the PWID surveyed from rural areas expressed willingness to use such centers. People who had recently overdosed, witnessed overdose, or received naloxone were significantly more likely to express interest in using SCFs than those who had not had those experiences. This may suggest that people most at-risk for overdosing would be most inclined to use the service that would potentially save their lives.¹¹⁹ In turn, this predicts that the monetary losses from lives lost to overdose would decrease.

Dollars Saved by Reductions in Crime and Other Societal Impacts

Perhaps one of the most significant results of harm reduction programs is that they build the trust with health and social service outreach workers needed to encourage people to avoid the negative consequences of drug use through safer use, managed use, or abstaining from use. And as costs associated with the health care required for these individuals decline, so do the crimes some commit in support of their addiction, as well as the social services required to support them and their families.

As mentioned earlier, studies find that new users of SSPs are five times more likely to enter drug treatment, and with regular use of SSPs, nearly three times more likely to report a reduction in injection frequency than those who never use these programs.¹²⁰ An early analysis of supervised consumption facilities suggests that users' increased access to health care professionals likewise increases the chances of their enrollment in treatment programs.¹²¹

In turn, once people with SUDs use treatment programs, the cost of former criminal behavior declines. A 2018 National Institute of Drug Abuse report notes that a return of \$4 to \$7 results from each dollar spent on addiction treatment programs due to the decline of drug-related crime and criminal justice costs.¹²² A study of medication-assisted treatment for drug and alcohol use in California in 2012 reported a benefits-to-cost ratio of 7-1, largely based on reduced crime and increased employment.¹²³

The societal impacts from increasing the number of people in recovery are less well-studied, but still promising. The National Institute of Drug Abuse report cited above also asserts that "major savings to the individual and to society...stem from fewer interpersonal conflicts; greater workplace productivity; and fewer drug-related accidents."¹²⁴

The potential improvements that reduced SUDs can contribute to the state's educational system are also worthy of consideration as societal savings. West Virginia University surveyed more than 2,200 teachers in

119 Allison O'Rourke et al., "Acceptability of safe drug consumption spaces among people who inject drugs in rural West Virginia," *Harm Reduction Journal* 16, no. 51 (2019), harmreductionjournal.biomedcentral.com/articles/10.1186/s12954-019-0320-8/ (accessed January 27, 2021).

120 Centers for Disease Control and Prevention, "Syringe Services Programs FAQs," Centers for Disease Control and Prevention, cdc.gov/ssp/syringe-services-programs-faq.html (accessed January 27, 2021).

121 Law Enforcement Action Partnership, "Harm Reduction," Law Enforcement Action Partnership, lawenforcementactionpartnership.org/our-issues/harm-reduction/#easy-footnote-bottom-11-861 (accessed January 25, 2021).

122 National Institute on Drug Abuse, "Principles of Drug Addiction Treatment: A Research-Based Guide (Third Edition)," National Institutes of Health, drugabuse.gov/publications/principles-drug-addiction-treatment-research-based-guide-third-edition/frequently-asked-questions/drug-addiction-treatment-worth-its-cost (accessed January 25, 2021).

123 Martha Hostetter and Sarah Klein, "In Focus: Expanding Access to Addiction Treatment Through Primary Care," The Commonwealth Foundation, commonwealthfund.org/publications/2017/sep/focus-expanding-access-addiction-treatment-through-primary-care (accessed January 28, 2021).

124 National Institute on Drug Abuse, "Principles of Drug Addiction Treatment: A Research-Based Guide (Third Edition)," National Institutes of Health, drugabuse.gov/publications/principles-drug-addiction-treatment-research-based-guide-third-edition/frequently-asked-questions/drug-addiction-treatment-worth-its-cost (accessed January 25, 2021).

the 2018-19 academic year. Seventy percent of them reported witnessing a rise in students living in homes with substance use issues. Most teachers (90 percent) admitted that they are not properly prepared to support children whose parents have SUDs.¹²⁵

To our knowledge, there are no measurements of how the decline in NAS births could affect the need for greater educational and mental health services for children and adolescents impacted by NAS. However, experts argue that children brought up in households where mothers continue substance abuse “are at high-risk to continue intergenerational patterns of substance abuse, criminal behaviors, and neglectful parenting.”¹²⁶ It is logical to assume that mothers who enter and succeed in recovery programs are better equipped to help break this intergenerational transfer of behavior. More of these children will arrive at school unburdened by chaotic home environments. Fewer of them are likely to end up in the criminal justice system, in foster care, and as drug users, and costs associated with those behaviors should concurrently fall.

In WV, a pilot Drug Free Moms and Babies project was initiated in 2012 to provide early intervention, addiction treatment, and recovery support services in four locations across the state. A 2018 analysis of its work found a significant reduction of non-prescribed positive drug screens from 81 percent positive in the first trimester to 22 percent positive at delivery in their sample of 393 patients.¹²⁷ The program has since been expanded to an additional 12 locations with the potential of improving the birth outcomes, reducing the mothers’ substance dependence, and decreasing the associated costs.¹²⁸

125 West Virginia Department of Education, “2018-2019 Year in Review,” West Virginia Department of Education, wvde.us/wp-content/uploads/2019/08/2018-19-YearInReview.pdf?utm_source=Superintendents+and+Board+2019&utm_campaign=893c41ee6c-EMAIL_CAMPAIGN_2019_08_16_07_50&utm_medium=email&utm_term=0_09fetc1050-893c41ee6c-94104567 (accessed February 3, 2021).

126 Yih-Ing Hser et al., “Long-term outcomes among drug-dependent mothers treated in women-only versus mixed-gender programs,” *Journal of Substance Abuse Treatment* 41, no. 2 (September 2011), [journalofsubstanceabusetreatment.com/article/S0740-5472\(11\)00031-6/fulltext](http://journalofsubstanceabusetreatment.com/article/S0740-5472(11)00031-6/fulltext) (accessed January 29, 2021).

127 Christa L. Lilly et al., “Drug Free Moms and Babies: Qualitative and Quantitative Program Evaluation Results from a Rural Appalachian State,” *Preventive Medicine Reports* 15, no. 100919 (September 2019), sciencedirect.com/science/article/pii/S2211335519300944?via%3Dihub (accessed January 29, 2021).

128 West Virginia Perinatal Partnership Program, “Drug Free Moms and Babies Project,” WV Perinatal Partnership Program, wvperinatal.org/initiatives/substance-use-during-pregnancy/drug-free-moms-and-babies-project/ (accessed January 29, 2021).

PART V

Recommendations

In compiling the data for this study, three major needs have emerged: better tracking of the incidence and comprehensive medical, social service, and community costs of drug use; improved access to harm reduction services for Kanawha County; and attention to and action on broader policies related to health and well-being that can help prevent our residents from developing SUDs. Each is considered in turn below.

Better Data Tracking and Distribution

Public policy is best made when decisionmakers have up-to-date information that allows them to conduct cost-benefit analyses of their options. As this report confirms many times, current statistics do not provide such information.

The data surveillance process for lives lost to drug overdoses which is relied upon to calculate the cost of fatalities should continue to be refined according to improvements initiated by the CDC and various states.¹²⁹ What is just as critical, however, is the systematic collection of information that clarifies what conditions are caused by drug use, how many people live with these conditions, and at what cost. This includes measuring the annual number of viral and bacterial cases contracted by people with SUDs discussed here (e.g., HIV, endocarditis, NAS) and many others that were not discussed (e.g., cellulitis, oral health diseases, neurological damage from non-fatal overdoses). Both the annual and lifetime costs of treating these conditions, and on which parties (insurance providers, Medicare, Medicaid, hospitals, taxpayers, and/or other health system users) these costs fall, are important factors to address in drug epidemic policy change.

Foster care and kinship costs associated with removal of children from parents with SUDs are also considerable and growing. Efforts should be made to quantify them as accurately as possible and consistently across states. Likewise, the educational costs associated with children with learning disabilities or emotional trauma attributable to NAS and with disruptions caused by living in homes where SUDs have significant impacts need to be understood more clearly, by policymakers and others. In every community, there may be other social costs linked to families struggling with drug use, including homelessness, food insecurity, and theft and other crimes. Ultimately, we need an understanding of how illicit drug use impacts the costs of all of these services to fully appreciate the size of the problem.

Other information which will help provide more accurate cost-benefit analyses include accounting of costs to operate harm reduction programs of all kinds and their success rate in terms of lives potentially saved and illnesses avoided among people who continue to use drugs. It would also be helpful to be able to measure eventual client success in drug treatment programs. State-run surveillance programs could collect and incorporate these measures into their databases. Additionally, academic studies of parents with SUDs accessing harm reduction programs in comparison with those not accessing services can potentially provide further understanding of programs' effectiveness for both parents and children.

129 Centers for Disease Control and Prevention, "Improving Data on Drug Overdose Deaths," Centers for Disease Control and Prevention, cdc.gov/surveillance/projects/improving-data-on-drug-overdose-deaths.html (accessed January 29, 2021) and Centers for Disease Control and Prevention, "Enhanced State Opioid Overdose Surveillance" Centers for Disease Control and Prevention," cdc.gov/drugoverdose/foa/state-opioid-mm.html (accessed February 16, 2021).

Wide Distribution of Harm Reduction Programs

People often debate harm reduction as if it is a binary service. You either have the service available in your region or you don't. What if any given region only had one physician who prescribed insulin or one nurse practitioner who prescribed blood pressure medicine? This comparison is not quite up to the task since diabetes and high blood pressure are not contagious, like hepatic C and HIV. If they were, one would be further shocked if such services were limited to one or two programs per county, or less.

For a potentially more successful approach to reducing the pains and preventable tragedies from drug use within a region — for our purposes, Kanawha County's 900 square mile area — we should consider a spectrum approach. How much harm reduction services do we really need? The answer at this point should be clear: A lot more.

Instead of imagining harm reduction programs as relatively stand-alone, imagine them integrated into other services. For example, what if every Cabin Creek Health Services clinic and Family Care clinic (both federally-funded clinics which service Kanawha County) could be permitted to give sterile syringes to clients most in need? Certain pharmacies could run mini syringe exchanges, like one recently instituted in nearby Beckley.¹³⁰ The Ryan White Program at the Charleston Area Medical Center (CAMC) could give out sterile syringes to its rising scores of clients who are being treated for HIV, which in turn would protect against potentially dozens of additional cases. A syringe services project integrated into these programs would also likely help with retention in care, which would then increase the chance of positive health outcomes. This would be especially crucial with programs like CAMC's Ryan White HIV program, where retention is vital for viral suppression.

This range of services is currently being offered in Kitsap County, Washington. Their comprehensive harm reduction program has moved in recent years from a centralized program to a distributed one, involving partners at medical facilities, pharmacies, health clinics, and a mobile unit to reach a limited number of rural clients in the region. Susan Turner, health officer for Kitsap Public Health, explained that these changes are designed to "increase access points in areas where people are already receiving services or hope to receive services. We know this model depends on diffuse availability of services where people already receive services."¹³¹

While this level of innovation would surely help, the most impactful harm reduction programs are those that meet people where they are, often by focusing on mobile services and devoted clinics that build trust and relationships outside of a standard health care setting. One can imagine that a network of such harm reduction programs placed throughout Kanawha County's two dozen towns, each serving the unique needs of their neighbors, could have a significant impact on the SUD-associated costs described in this report.

Policies to Enhance Residents' Health and Well-Being

The most comprehensive recommendation which follows from this report is the most difficult to implement. Recall that WV ranks low among all states in comprehensive measures of physical and mental health and social well-being. These factors are known as social determinants of health — the "conditions in the environments where people are born, live, learn, work, play, worship, and age that affect a wide range of

130 Associated Press, "Doctor Spends Own Money to Establish Needle Exchange Program in Beckley," WCSH, ABC 8, August 15, 2016, wchstv.com/news/local/doctor-spends-own-money-to-establish-needle-exchange-program-in-beckley (accessed January 29, 2021).

131 Austin Macalus, "Health District Rolls Out Changes to Syringe Exchange Program Despite Concerns," *Kitsap Sun*, October 2, 2019, kitsapsun.com/story/news/2019/10/02/kitsap-public-health-district-rolls-out-changes-syringe-exchange-program/3846573002/ (accessed January 29, 2021).

health, functioning, and quality-of-life outcomes and risks.”¹³² They include many considerations which are organized into the categories of economic stability, education access and quality, health care access and quality, neighborhood and built environment, and social and community context.¹³³

Income level and educational attainment are factors also associated with substance use. Other important considerations are interpersonal, household, and community dynamics.¹³⁴ This overlap between social determinants of health and determinants of drug use is striking, and it argues for changes in policies that can protect the most vulnerable from increased risk for drug addiction. The array of such changes that would be required to address these social determinants of health, and the true drivers of much of the addiction epidemic, is extensive.

In order to ensure economic stability and access to quality physical and mental health care, we would need laws that provide a living wage and health care benefits of the kind unionization has provided workers. In order to make quality education accessible for all, we would need to provide low-income families with computer technology and use of high-quality broadband services not frequently found in the most rural parts of the country, including parts of Kanawha County. In order to provide individuals with decent community and home environments, we would need stronger regulations addressing healthy air, water, and soil. In order to secure a strong family life and a thriving community for every West Virginia resident, we would need to see substantial legislative and local reform to ensure all families and individuals have access to affordable and safe recreation activities, transportation to shop for food and other necessities in local communities, and a comprehensive network of counseling and social services to overcome life’s rough patches.

It is a lot to ask for. While even these conditions don’t guarantee the end of addiction and its many horrible costs, they can improve not just the lives of people with substance use disorders, but the quality of life for all of us.

132 Healthy People 2030, “Social Determinants of Health,” Office of Disease Prevention and Health Promotion, health.gov/healthypeople/objectives-and-data/social-determinants-health (accessed January 29, 2021).

133 Centers for Disease Control and Prevention, “About Social Determinants of Health (SDOH),” Centers for Disease Control and Prevention, [cdc.gov/socialdeterminants/about.html](https://www.cdc.gov/socialdeterminants/about.html) (accessed January 29, 2021).

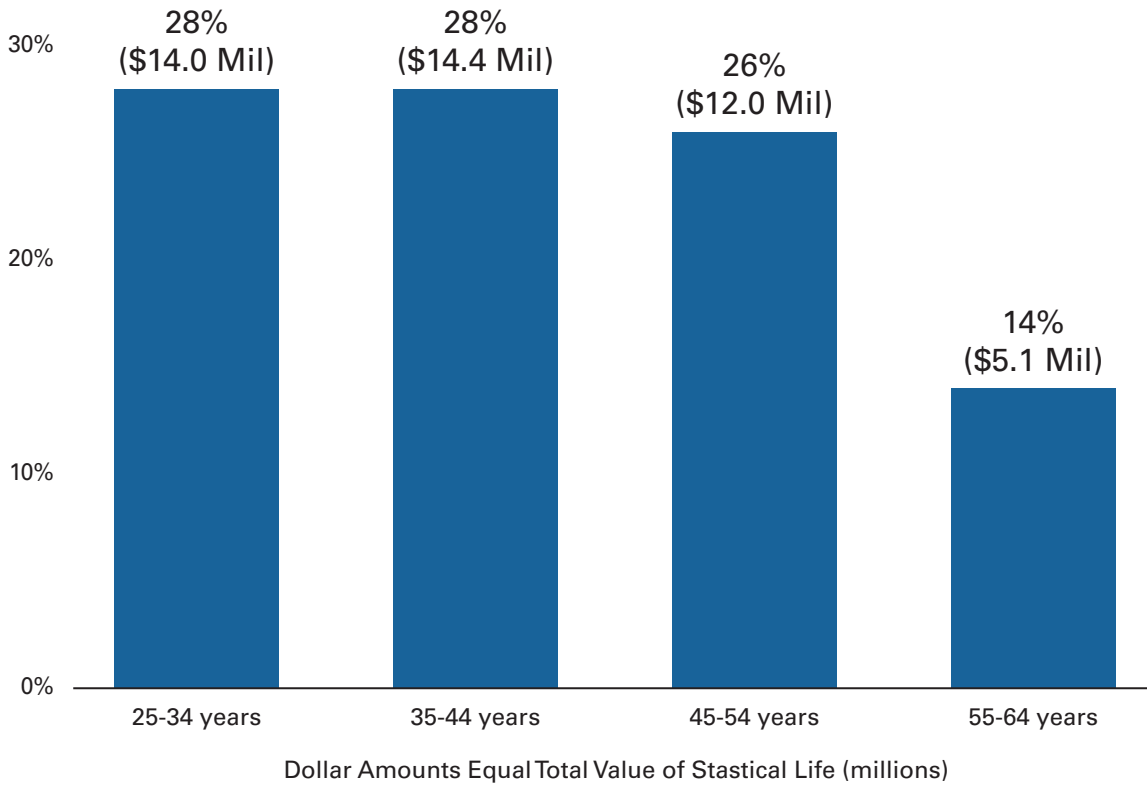
134 Healthy People.gov, “Substance Abuse: Substance Abuse Across the Life Stages,” Office of Disease Prevention and Health Promotion, healthypeople.gov/2020/leading-health-indicators/2020-lhi-topics/Substance-Abuse/determinants (accessed January 29, 2021).

Appendix

Appendix Figure 1

Share of 2019 Drug Deaths in Kanawha County Concentrated Between 25- and 54-Year-Olds

Share of all drug deaths by age group in Kanawha County, 2019, and the estimated costs of these deaths



Source: FPI analysis of data from the Centers for Disease Control and Prevention WONDER Online Database

Appendix Figure 2

Estimates of Non-Fatality Damages in West Virginia

	2018	2019
Population of West Virginia	1,805,832	1,792,147
Share of People Who Engage in Illicit Drug Use	2.852547%	2.692114%
Estimated Number of People Who Engage in Illicit Drug Use	51,512	48,247
Average Cost Associated with Individuals with Drug Use Dependency	\$30,000	\$30,000
Total Non-Fatality Damages (Rounded)	\$1,500,000,000	\$1,400,000,000

Source: FPI analysis of data from SAMHSA and ACS

Appendix Figure 3

Estimates of Non-Fatality Damages in Kanawha County

	2018	2019
Estimated Number of People in WV Who Engage in Illicit Drug Use (from Appendix Figure 2)	51,512	48,247
Share of WV Total Population in Kanawha County	10.06525%	9.93914%
Estimated Number of People in Kanawha County Who Engage in Illicit Drug Use	5,185	4,795
Average Cost Associated with Individuals with Drug Use Dependency	\$30,000	\$30,000
Total Non-Fatality Damages (Rounded)	\$156,000,000	\$144,000,000

Source: FPI analysis of data from SAMHSA and ACS

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