FINAL REPORT

Understanding Declining Rates of Drug Overdose Mortality in Eastern Kentucky

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Center of Excellence in Rural Health

The Walsh Center for Rural Health Analysis

NORC AT THE UNIVERSITY OF CHICAGO

Acknowledgements

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The Walsh Center's mission is to conduct timely policy analyses and research that address the needs of government policymakers, clinicians, and the public on issues that affect health care and public health in rural America. The Walsh Center is part of the Public Health Research Department at NORC at the University of Chicago, and its offices are in Bethesda, Maryland. The Center is named in honor of William B. Walsh, MD, whose lifelong mission was to bring health care to underserved and hard-to-reach populations.

The University of Kentucky Center of Excellence in Rural Health was established by state legislation in 1990 to address health disparities in rural Kentucky and the unique challenges faced by our communities. The mission was and still is today to improve the health and well-being of rural Kentuckians. For three decades, the Center has partnered with communities, providers, students, and individuals to provide health professions education, health policy research, health care service, and community engagement toward reaching this mission.

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Introduction

With funding from the Centers for Disease Control and Prevention (CDC) and the National Association of County and City Health Officials (NACCHO), the NORC Walsh Center for Rural Health Analysis and the University of Kentucky Center of Excellence in Rural Health (UK CERH) conducted this study to understand possible factors associated with declining rates of drug overdose mortality in Eastern Kentucky. Several counties in Eastern Kentucky have seen declines in drug overdose mortality rates over the past decade, even as overdose rates have risen in the state of Kentucky as a whole, as well as in the Appalachian regions of neighboring states such as Pennsylvania, Ohio, and West Virginia. Through an intensive qualitative study, NORC and UK CERH identified potential policies and strategies that may be contributing to the declines, including approaches that could be implemented in other communities.

Background

In October 2018, NORC released an opioid mapping tool (http://opioidmisusetool.norc.org), which provided county-level drug overdose mortality data for two 5-year time periods.[1] Drug overdose mortality data was obtained from the CDC National Center for Health Statistics (NCHS) National Vital Statistics System (NVSS).[2] Drug overdose mortality was determined using the standard International Classification of Diseases 10th Revision (ICD-10) underlying cause-of death codes used by CDC (X40-X44, X60–X64, X85, and Y10–Y14). The tool highlighted the declining drug overdose mortality rates in Eastern Kentucky, in contrast to other neighboring states. Based on data through 2017, we determined that between 2008-2012 and 2013-2017, of the 10 counties nationally with the largest decline in drug overdose mortality rate, 8 were in Eastern Kentucky. Of the top 20 counties nationally, 14 were in Eastern Kentucky. Table 1 shows the counties in Eastern Kentucky with the greatest declines in drug overdose mortality.

Table 1. Declines in Drug Overdose Mortality in Eastern Kentucky

County	Drug Overdose Mortality Rate (2013-2017)^	Decline in Drug Overdose Mortality Rate between 2013-2017 and 2008-2012
Clay	29.5	-52.2 deaths per 100,000
Johnson	38.8	-49.7 deaths per 100,000
Floyd	73.8	-34.0 deaths per 100,000
Magoffin	35.6*	-32.8 deaths per 100,000
Breathitt	46.4	-32.0 deaths per 100,000
Bath	44.2*	-30.7 deaths per 100,000
Powell	70.1	-30.4 deaths per 100,000
Letcher	46.3	-28.8 deaths per 100,000

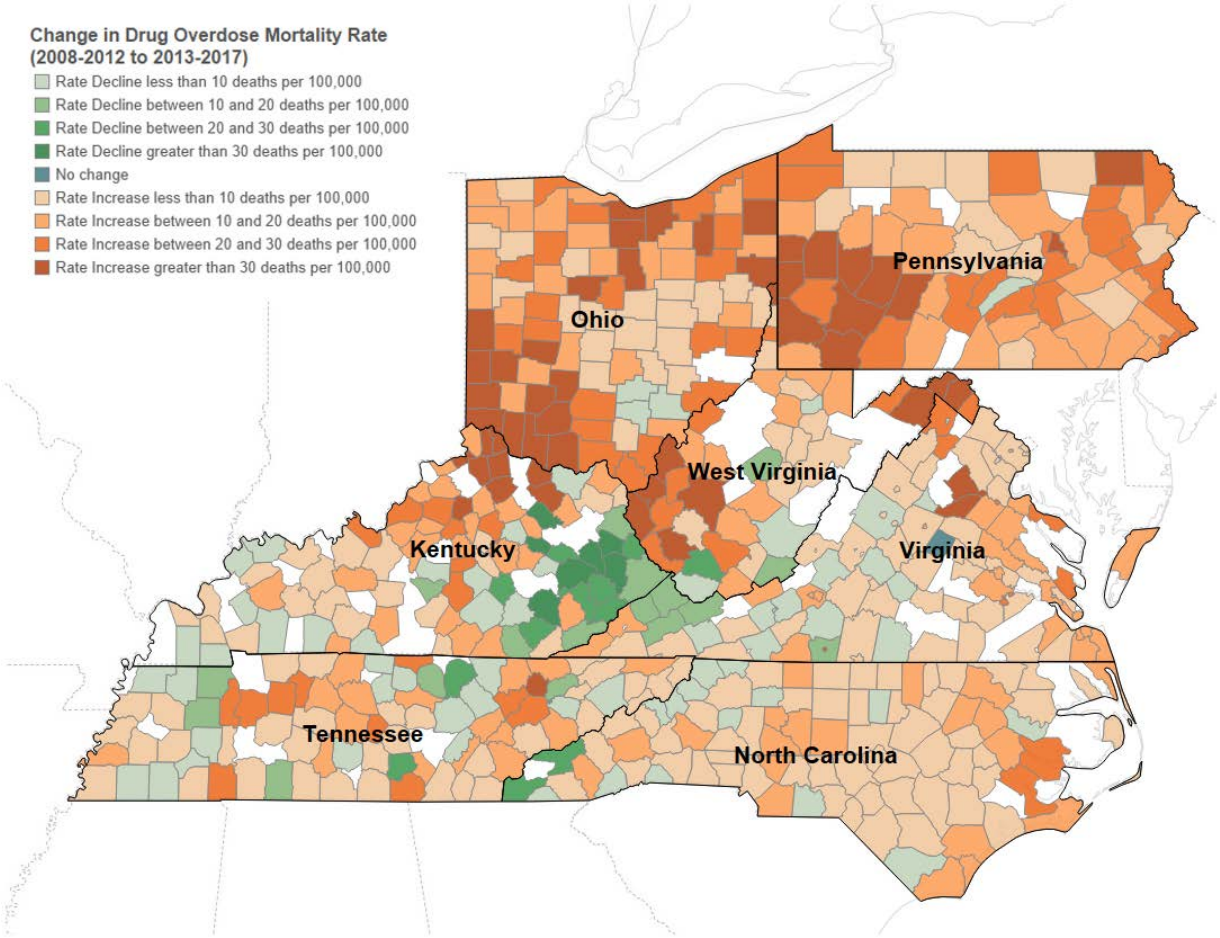
^Age-adjusted drug overdose mortality rate per 100,000 for population ages 15-64.

*Crude death rate provided for these counties, as fewer than 20 deaths were reported during the time period.

Data Source: Mortality rates provided by Centers for Disease Control and Prevention, National Center for Health Statistics. Accessed at http://wonder.cdc.gov/mcd-icd10.html. ICD-10 codes: X40-X44, X60-X64, X85, Y10-Y14.

Figure 1 shows county-level data comparing drug overdose mortality rate increases and decreases from 2008-2012 to 2013-2017. This graphic shows the cluster of counties in Eastern Kentucky where the rates declined between these two time periods, compared to the dramatic increases in Southwest Ohio, Southern West Virginia, and Southwest Pennsylvania.

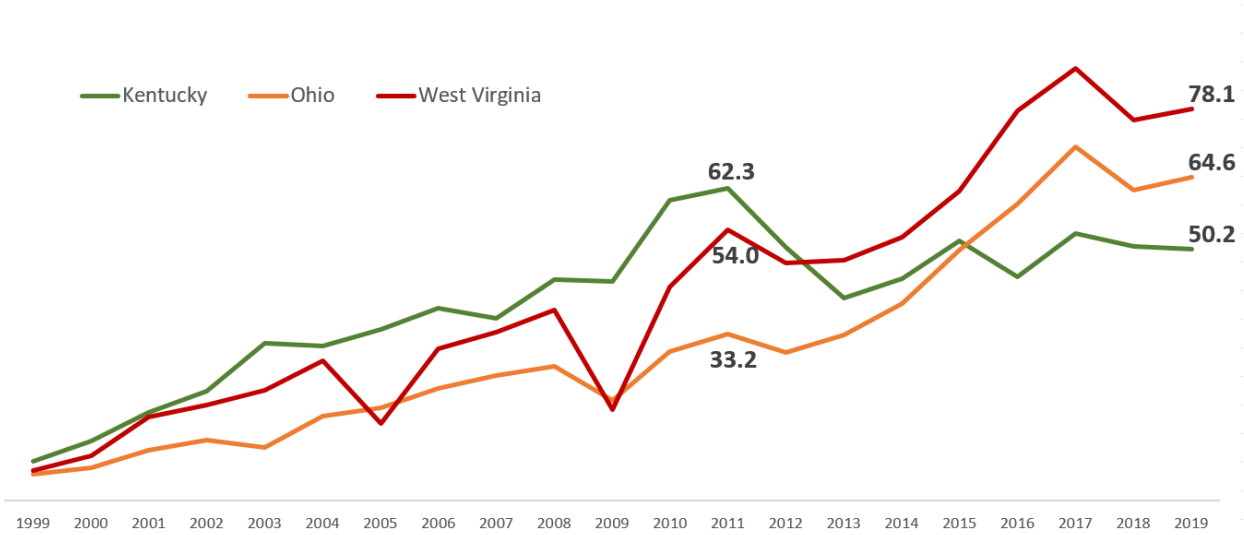
Figure 1. Changes in Drug Overdose Mortality from 2008-2012 to 2013-2017



Data Source: Mortality rates provided by Centers for Disease Control and Prevention, National Center for Health Statistics. Accessed at http://wonder.cdc.gov/mcd-icd10.html. ICD-10 codes: X40-X44, X60-X64, X85, Y10-Y14.

Figure 2 shows the trend in drug overdose mortality within the Appalachian counties of Kentucky, Ohio, and West Virginia, further highlighting the differences seen across Appalachian states. From 2011 to 2013, the drug overdose mortality rate decreased in Appalachian Kentucky, while rates remained fairly constant in Appalachian Ohio and West Virginia. Appalachian Kentucky did not experience the dramatic increase in drug overdose mortality between 2014 and 2017 that occurred in Appalachian Ohio and West Virginia. Additionally, in 2019, drug overdose mortality rates increased in both Appalachian Ohio and West Virginia, following a decline in 2018; however, Appalachian Kentucky did not experience the same increase.

Figure 2. Drug Overdose Mortality (ages 15 to 64)*, among Appalachian Counties



*Age-adjusted drug overdose mortality rate per 100,000 for population ages 15-64.
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Methodology

We used a qualitative study design to explore research questions about the observed declines in overdose mortality rates in Eastern Kentucky. To guide the study's research protocol, we conducted preliminary literature and media searches to understand the history of the region as it related to overdose mortality, and examined quantitative overdose mortality data through NORC's overdose mapping tool.

We also conducted an exploratory site visit to the region in November 2019. During this visit, our research team met with local stakeholders throughout Eastern Kentucky from several sectors, including representatives from the public health, criminal justice, economic development, health care, treatment, recovery, education, and advocacy sectors. UK CERH leveraged their connections within the region to recommend key stakeholders with in-depth experience and perspective that would be important to meet with during this visit. Additionally, we coordinated with a representative from the Kentucky Department for Public Health (KDPH), who helped arrange meetings with critical KDPH staff. During these informal meetings, we asked stakeholders two main hypothesis-generating questions to inform the study design and protocol and to elicit meaningful and relevant information during final data collection:

1) Based on your experience and expertise, what hypotheses do you have for why drug overdose rates in Eastern Kentucky may be declining?

2) When we conduct formal data collection, who are the key stakeholders we should interview?

Data Collection

Although we intended to collect data during a second site visit, due to COVID-19 travel restrictions we shifted to remote data collection, conducting 38 semi-structured telephone interviews with key stakeholders in the Eastern Kentucky region. The NORC Institutional Review Board (IRB) reviewed the study and determined the data collection was not human subjects research. Before each interview, the NORC interviewer conducted informed consent with the participant.

We formally interviewed several of the stakeholders that participated in the exploratory site visit in 2019, along with additional stakeholders identified by NORC and UK CERH. UK CERH supported NORC with recruitment for interviews among the substance use stakeholders from the region. The semi-structured nature of the interviews allowed us to explore various topics related to the factors the stakeholders believed to be contributing to declining overdose mortality rates. Stakeholder groups included representatives from the following sectors: criminal justice (9 interviews); prevention/education (7); economic development and recovery (6); treatment (6);

state and local health departments (5); health care (3); and harm reduction (2). We intended to conduct a focus group with individuals actively in treatment, but due to COVID-19 travel restrictions and social distancing guidelines we were unable to travel to the region.

We used the same interview protocols with all stakeholder groups to ensure that we captured a diverse set of perspectives across research questions. The interviews explored the respondents' initial reaction to observed declines in overdose mortality and perceptions as to what may have driven these declines. Protocol topics explored key hypotheses related to increased access to treatment and recovery; Medicaid expansion; law enforcement and the criminal justice system; harm reduction; primary prevention and community coalitions; and shifts in drugs of choice. The research protocols also encouraged respondents to discuss other potential factors contributing to declines in overdose mortality; data sources; study implications; and strategies for dissemination of findings.

Data Analysis

The project team conducted a thematic analysis of qualitative data using NVivo qualitative analysis software (QSR International Pty Ltd., Melbourne, Australia). We developed a codebook to identify themes and topics of interest based on the research hypotheses developed after the initial site visit. Coded themes included reactions to overdose data, shift in drug availability or use, increased access to treatment, criminal justice system, recovery community, harm reduction, prevention/education, stigma, and partnerships/longstanding commitment. The study team participated in an iterative process to develop and refine the codebook. We used the codebook to analyze the data and inductively identified additional findings. The analysis culminated in this written report.

Findings

I. Stakeholder Reactions to Trends in Drug Overdose Mortality

At the beginning of each interview, we briefly explained the observed trends in overdose mortality in Eastern Kentucky. We noted that 8 of the 10 counties nationally that have seen the largest decline in overdose mortality rates from the two time periods 2008-2012 and 2013-2017 were in Eastern Kentucky—and then asked if the respondent was surprised by these data. Respondent reactions varied. Some interviewees were surprised, especially at the depth of improvement in Eastern Kentucky. One surprised respondent who worked in substance use treatment noted that they have not seen changes in terms of the number of individuals seeking treatment at their facility. Others were not surprised by the findings, and one interviewee shared, "We know we have one of the highest addiction rates, but I think we are taking huge leaps towards correcting the problem and getting people the help. It doesn't surprise me." Some who were not surprised described the reasons why they believed Eastern Kentucky has seen declines in drug overdose mortality, which is explained in more detail in the next section.

II. Policies, Programs, and Interventions Potentially Contributing to Decline in Drug Overdose Mortality

A. Improving Prescribing Behaviors

Kentucky has implemented several policies over the past decade designed to limit the availability of prescription opioids, which was driving overdose mortality rates in Eastern Kentucky in the late 2000s and early 2010s.[3] Many interview respondents indicated that less access to prescription opioids is likely contributing to the declines in drug overdose mortality. As stated by one respondent, "I think initially in the early stages, if you saw declining rates, it may have been success in the prescription drug diversion problem." Respondents described the legislation that has made it more difficult for doctors to prescribe opioids in large quantities. Kentucky was one of the first states to launch a prescription drug monitoring program. In 1998, the Kentucky All Schedule Prescription Electronic Reporting (KASPER) system was created; however, it was not until 2012 when House Bill 1 passed that providers were required to use KASPER when prescribing controlled substances.[4] Many interview respondents referenced this legislation as a major impact on the availability of opioids in Kentucky. In addition to requiring use of KASPER, House Bill 1 stated that "only a physician having a full and active license to practice medicine issued under KRS Chapter 311 shall have an ownership or investment interest in a pain management facility."[5] A representative from the Kentucky Office of Drug Control Policy reported that "from 2011 to 2018, 100 million fewer dosage units of opioids a year were prescribed…We got rid of 36 pain clinics. Low-hanging fruit with that 2012 legislation."

B. Increasing Access to Substance Use Treatment

One of the most commonly reported reasons for the decline of drug overdose mortality rates in Eastern Kentucky was increased access to substance use treatment providers over the past five years.[6] Many interview respondents described the dramatic shift in the availability of treatment providers between the two time periods. As one respondent from the criminal justice sector stated, "I think that the access and availability of treatment resources in Eastern Kentucky has grown exponentially."

Respondents said that one of the major contributors to the increased access was implementation of the Affordable Care Act and Medicaid expansion. Kentucky expanded Medicaid in 2014, the same year as its Appalachian neighbors, Ohio and West Virginia, and one year before Pennsylvania.[7] Both Kentucky and West Virginia saw notable declines in its uninsured population as a result. Between 2013 and 2016, the percentage of adults who lacked health insurance declined by 14.5 percentage points in Kentucky and by 19.3 percentage points in West Virginia. By comparison, the decline during the same time period was 7.5 percentage points in Pennsylvania and 7.4 percentage points in Ohio. Among neighboring states that did not expand Medicaid, the decline in the uninsured population between 2013 and 2016 was 9.4 percentage points in North Carolina, 2.9 percentage points in Tennessee and 2.3 percentage points in Virginia.[8] In 2014 and 2016, Eastern Kentucky exhibited the largest portion of Medicaid enrollment across the state.[9]

Prior to implementing the Affordable Care Act, Kentucky did not cover substance use disorder (SUD) treatment for Medicaid enrollees. Kentucky's changes to its Medicaid program included the addition of a SUD treatment benefit for enrollees in Kentucky's traditional Medicaid program[9], as well as coverage for all levels of treatment, including residential treatment; intensive outpatient programs; medication-assisted treatment (MAT); and peer support.[10] Previously, treatment providers had to individually seek approval from the Centers for Medicare & Medicaid Services (CMS) to cover those services. The number of enrollees in Kentucky's Medicaid expansion program receiving substance use services increased by more than 700 percent between the first quarter of 2014 and the second quarter of 2016, from approximately 1,500 to more than 11,000 care encounters.[6]

Treatment providers discussed how Medicaid expansion and changes to traditional Medicaid have impacted their ability to provide substance use treatment services. By early 2015, one of the largest treatment providers in Eastern Kentucky, Addiction Recovery Care (ARC), admitted their first residential program patient under the new benefit structure. Since that time they have grown dramatically, admitting over 8,000 clients into residential treatment. They currently have 700 employees, half of whom are in recovery and a third who are graduates of their program. Other treatment providers have experienced similar growth over this time frame. Nearly all of the

respondents attributed the increase in treatment availability in Eastern Kentucky to the expansion of Medicaid and other changes to the Medicaid program. As one respondent from the criminal justice sector said, "Medicaid expansion has made a tremendous difference. More folks are able to access treatment and more treatment exists because of the expansion. Before, for a treatment center to exist, they had no means of any kind of revenue. Now, they are able to leverage Medicaid, more treatment centers are able to exist and expand, and so many more people are able to access it." Several respondents noted that prior to Medicaid expansion, Operation UNITE vouchers were critical in helping individuals seek addiction treatment. Founded in 2003, Operation UNITE is a nonprofit organization dedicated to preventing addiction and providing individuals with adequate access to addiction treatment resources. A representative from the criminal justice field stated that the Operation UNITE vouchers "were 10,000 times more important then, because now everyone is Medicaid covered."

Respondents also described the increased availability of a variety of treatment options, including MAT, as a factor in reduced overdose rates. One respondent described their personal experiences with SUD and the difficulty they had faced finding treatment options in Eastern Kentucky 10 years ago: "I remember after one overdose, I ended up in a psychiatric ward, which was the closest thing to me that was open, the only place they had to put me. Now there are more detox and acute care centers, more access to MAT." Kentucky continues to expand access to MAT through its state Medicaid program; for example, in 2019, in addition to buprenorphine and Vivitrol, Kentucky Medicaid began covering methadone as another method of MAT.[11] Some of the success stories associated with increased treatment access in Eastern Kentucky included shorter waiting times and the greater availability of evidence-based treatment models. One respondent noted that they can now "get people treatment on demand," which has led to the region "starting to turn the corner on addiction." Other treatment components that respondents highlighted included the longer terms of many programs, in addition to the focus on skill development and employment. As one respondent said, "Some of the largest and most successful treatment providers have plans to keep their clients from 90 days up to as much as a year." The respondent reported that in these programs, treatment providers were able to bill Medicaid for the residential stay, then for intensive outpatient case management and peer support. After that point, they often hired clients to work as peer recovery specialists or for social enterprises such as bakeries, automotive shops, and small construction companies.

Respondents also described the wide range of ways that people could access treatment in Eastern Kentucky, from referrals from judges, law enforcement, or harm reduction sites, to finding services through community organizations, such as Operation UNITE. Respondents noted that the treatment landscape has evolved dramatically in Eastern Kentucky over the past 5 to 10 years, which they believe had a notable impact on the declining rates of drug overdose mortality.

C. Focus on Individuals in Recovery

Respondents described a significant focus on supporting individuals in recovery across Eastern Kentucky, specifically in terms of second chance employment, recovery housing, and peer support. Stakeholders in Eastern Kentucky reported that they recognized the benefit of incorporating employment opportunities into the recovery journey. For example, a stakeholder from the criminal justice field shared that the local "chamber of commerce is connected to these issues, pulling in employers around the state and talking about hiring folks with SUD and who have been formerly incarcerated." Additionally, one respondent said, "Now employers are working with treatment centers to help provide clients with meaningful employment which is so essential in recovery because purpose is so essential in recovery. The willingness of employers to hire people with a record or a history of addiction has helped keep people in recovery, which ultimately would contribute to the decline in mortality rates." Respondents described that organizations working on SUD issues in Eastern Kentucky realized the need for a holistic approach to treatment. A representative from the economic development sector highlighted this point when discussing Eastern Kentucky communities, stating that "a lot of times the capacity to find meaningful solutions resides in communities."

Several respondents also discussed the Recovery Kentucky model as a factor contributing to declining drug overdose mortality rates. The Recovery Kentucky model was originally developed under Governor Fletcher in 2007, and was a joint effort between the Kentucky Department for Local Government, the Department of Corrections, and Kentucky Housing Corporation. Currently, 14 Recovery Kentucky centers across the commonwealth provide housing and recovery services for up to 2,000 Kentuckians across the state.[12]

Another respondent described seeing growth in the number of Alcoholics Anonymous and Narcotics Anonymous meetings, and that recovery was celebrated in a way it was not previously. Additionally, respondents shared that as the recovery community grew, individuals in the early stages of recovery had many role models that demonstrated recovery success, which gave them hope as they go through their own recovery journey.

D. Evolving Approach of the Criminal Justice System

The criminal justice system, including police officers in law enforcement and local judges in the court system, interact at different stages of the criminal justice process with individuals who use drugs. In speaking with law enforcement stakeholders, we learned that there has been a shift in the role of police officers, from immediately arresting a person who uses drugs and initiating them into the court system, to trying to refer these individuals to treatment. The Kentucky State Police started the Angel Initiative in 2016, allowing anyone experiencing SUD to come into a post and receive help in finding and accessing treatment.[13] This has been a valuable and impactful program, according to interviewees. Operation UNITE worked closely with the Angel

Initiative, providing treatment vouchers that helped individuals quickly connect with treatment options. One interviewee said, "We [police officers] still do enforcement, but we also have another avenue. The idea is that we get involved before they get to the criminal justice system because of decisions they're making because of addiction. Get them earlier on before they rack up charges and felonies." One interviewee from the health care sector noted that in some communities, while attitudes among law enforcement have been "changing…for the better as far as understanding SUD," they were still not consistent across the region and depended on police leadership.

The other key aspect of the criminal justice system that has influenced declining overdose mortality rates, according to respondents, was the changing approach within the judicial system and the impact of local judges. One participant from the Kentucky state government candidly shared, "Our first step, which was to incarcerate our way out of the problem, has proven to be a disaster." Interviewees described how judges across Eastern Kentucky have shifted from sentencing people who use drugs to prison, to looking for alternative sentencing options and opportunities to provide support. Judges were able to send individuals directly to treatment. Several respondents specifically mentioned the work of a district court judge with whom we spoke. He noted that he had sent 256 residents from his county to treatment in 2019 and described the dedication and commitment within his county to help individuals suffering from SUD find treatment. He stated, "Out of the 256, I'm guessing the county jailor or sheriff drove 100 of those people to treatment." Within his court he integrated a peer support specialist from a local treatment facility who served as a community liaison five days a week. The peer support specialist experienced similar struggles as the individuals coming through the court system, so they trusted him; he provided a warm hand off to the treatment facilities.

While the judge that we interviewed operates outside of a formal drug court, other respondents specifically discussed the potential positive impact of drug courts. Drug courts are specialty courts where individuals complete a substance use treatment program under the supervision of a judge,[14] or another alternative to incarceration. Representatives from Operation UNITE noted that when the organization was founded, there were only five drug courts in the 5th Congressional District, which includes most of Eastern Kentucky. Now, every county in the district operates a drug court, as do 113 of 120 counties in Kentucky.[15] Operation UNITE worked with the Administrative Office of the Courts to expand these specialty courts. Overall, respondents discussed the benefits of drug courts; however, some noted that the effectiveness of the drug courts could vary by county.

E. Expansion of Syringe Services Programs

Many interviewees commented on the benefits of syringe services programs (SSPs) in Eastern Kentucky. Kentucky SB 192, passed in 2015, allowed local health departments to operate Harm

Reduction and Syringe Exchange Programs (HRSEP).[16] To start a HRSEP in a local community, the local health department, the city government legislative body, and the county government legislative body all had to agree on the decision. One interviewee from the Kentucky state government said, "I think…the communities deserve credit because they rose up. The way the law was passed was each community had to initiate the decision to open one. They have to get approval, and it took a lot of ground work from those communities, but they became tired of losing their loved ones…I think that is significant that we had a local grassroots effort to do harm reduction and get folks Narcan." As of October 19, 2020, Kentucky has 74 harm reduction sites, most of which are situated in the eastern region of the state.[17] This number was greater than all neighboring states, including Ohio, West Virginia, and Tennessee. Ohio had 32 harm reduction sites, 8 of which were located in Appalachian counties[18]; West Virginia had 18 sites[19]; and Tennessee had 7 sites, 3 of which were located in Appalachian counties.[20]

Interviewees commented on how SSPs are a safe space for individuals who use drugs to learn about the effects of drug use and the resources available to them. One individual from a legal nonprofit noted, "Needle exchanges get people to resources in a beautiful open welcoming space. Even if you decide not to use those resources, you learn how to use drugs in a safer way." Finally, interviewees noted that the expansion of SSPs in Eastern Kentucky provided another touchpoint for accessing treatment services.

F. Increased Distribution of Naloxone

Respondents mentioned another factor that may have reduced rates of drug overdose mortality: increased access to naloxone (Narcan). In addition to being distributed at SSPs, interviewees said that more police officers were being trained to use and carry naloxone in Eastern Kentucky. Local pharmacists also carried naloxone and were able to sell it and teach the community how to use it effectively.

Interviewees shared that family members of individuals who used drugs were able to have naloxone close by in the event they needed to use it on their loved one. While naloxone may have played a role in reducing drug overdose deaths, many respondents shared that the notable increase in naloxone distribution has occurred over the past several years, and therefore may not have played as significant a role in mortality reductions observed in the time period of this study.

G. Prevention and Education

Stakeholders discussed prevention efforts and substance use education as contributing factors to the observed declines. There are a variety of prevention education programs, but the Eastern Kentucky region has a unique program—Operation UNITE. The UNITE approach engages adolescents and teens throughout their schooling via presentations and UNITE club, and in the

summers through Operation UNITE camp. An Operation UNITE representative shared that the organization employs 54 AmeriCorps educators who tutor children in academic subjects, for example math, because "there [are] data out there that show that students who are able to make advances academically have the lowest addiction rate." By taking this interdisciplinary and holistic approach to helping children and adolescents, Operation UNITE strives to prevent substance use and addiction before it starts.[21] A representative from the criminal justice sector noted that "if you are going to do a prevention education program you have to keep it dynamic and vibrant because kids get tired of seeing the same slides every year…Operation UNITE has been a dynamic program."

II. Community Environmental Factors in Eastern Kentucky

Interviewees discussed several community environmental factors unique to Eastern Kentucky that they believed had contributed to the observed declines in drug overdose mortality.

A. Longstanding Political Commitment to Addressing Substance Use in the Region

Respondents described the consistent and bipartisan political support from influential leaders like Congressman Hal Rogers (R; 1981–present) and Governors Ernie Fletcher (R; 2003–2007) and Steve Beshear (D; 2007–2015), who ensured the allocation of resources and attention to opioid misuse concerns in Kentucky. Respondents believed that Congressman Rogers' longstanding commitment to addressing opioid misuse in his district contributed to the observed overdose mortality declines in the region. Congressman Rogers launched Operation UNITE in 2003, in response to a special report published in the Lexington *Herald-Leader* newspaper titled, "Prescription for Pain."[22]

Respondents consistently highlighted this early political support as a key factor in creating an environment that supported treatment and recovery. A treatment expert shared that Senator Markey (D; Massachusetts) called Rogers "the Paul Revere of the national opioid crisis." Rogers helped ensure priority funding to organizations like Operation UNITE, which provided resources within the region long before the implementation of Medicaid expansion, and brought attention to the gravity of drug addiction before others.

Before Kentucky Medicaid coverage was expanded in 2014, Eastern Kentucky did not have treatment facility beds readily available. A representative from the criminal justice sector explained, "There would be times when we would have someone in Eastern Kentucky needing a bed and we couldn't find one unless it was 500 miles away." During this time, Operation UNITE helped individuals find treatment facilities with vacant beds by implementing a state hotline and website, findhelpnowky.org, in partnership with the University of Kentucky's Injury Prevention

Research Center, which is still in use today. Prior to Medicaid expansion, Operation UNITE's treatment vouchers were one of the main sources of funding for treatment and recovery services, making UNITE an essential stakeholder supporting Kentucky's longstanding history of addressing addiction concerns.

A stakeholder from the recovery sector explained how Governor Fletcher facilitated continued growth of the recovery housing community. Fletcher learned of the peer-led, service model of recovery housing that was taking place in Louisville and Lexington and recognized the need to replicate this model in Eastern Kentucky. With regard to expanding the recovery housing model, the recovery expert explained that Fletcher "brought all the agencies into one room [and said] we need to figure this out so we can fund these."

Additionally, several respondents noted that former Kentucky Governor Steve Beshear had a significant impact on addressing SUD and helped Kentucky residents access affordable treatment. A stakeholder from the treatment sector explained, "In the summer of 2014, former Governor Beshear…became a national leader in rolling out the Affordable Care Act, the Medicaid expansion, and when they did the Medicaid expansion they had the forethought to put a SUD treatment benefit for all levels of care" for all Medicaid enrollees. Substance use treatment providers interviewed as part of this study noted that since Kentucky's implementation of Medicaid expansion in 2014, Medicaid has been the primary source of funding for addiction treatment services within their facilities. With a robust existing treatment and recovery network, this commitment to expanding affordability allowed Kentucky to effectively address SUD in the state's Eastern region.

B. Appalachian Culture

Respondents discussed how the notion of an Appalachian culture or shared identity helped Eastern Kentucky residents come together to recognize and find innovative solutions to addiction issues. A respondent from the health care field noted, "The people in Appalachia are resilient people but have had a lot of adversity." This adversity was evidenced by job loss, lack of economic growth in the region, higher rates of addiction and deaths of despair, and high rates of drug overdose mortality. While these challenges contributed to a stigma that is often associated with the Appalachian region, they also created opportunities for residents of Appalachia to come together and redefine what it meant to live in an Appalachian community in which residents look out for one another, build capacity, engage other members of the community, and work to address addiction and drug overdose mortality. A representative from Operation UNITE illustrated the resilience of Appalachian communities when they said, "Appalachian communities are independent. They take care of themselves. This was an issue that has truly brought all of us together because what happened in Pike [County] impacts Harlan [County] and so forth."

A representative from the criminal justice community discussed some of the grassroots efforts taking place to address SUD: "People starting these [programs] are from here; they know everyone and take more vested interest." This idea of local coalitions taking care of community members speaks to the strength and influence the Appalachian identity and culture had on organizations working to mitigate SUD issues; not only did these local coalitions want to help those struggling with SUD, but they had a shared identity that they attributed to being from the Appalachian region.

C. Partnerships, Coalitions, and Collaboration

Several respondents discussed the contributions of partnerships, coalitions, and community collaboration to the observed declines in overdose mortality. They noted that robust and cross-sector collaborations among local partners have made it possible to take a multifaceted approach to address issues related to addiction and drug use in the region. Key partners included treatment and recovery organizations, state and local health departments, the criminal justice system, faith-based organizations, and local nonprofits. A criminal justice representative explained, "Everybody at the table now has learned this is not a one agency problem—we have to all say this is my part and your part now let's make it work." According to community stakeholders, this collective engagement has been central to making the region's treatment and recovery community so robust and successful.

Additionally, while these collective efforts provided the region with a diverse array of resources, they also provided a support system for those experiencing SUD to help them through their recovery. A stakeholder from the recovery sector explained, "Through community action and community involvement collaboration, it provides this network or web of assistance" and these collaborations provide "an extra layer of insulation against the isolation that occurs in addiction."

D. Reduced Stigma

Stigma around SUD was a common theme throughout interviews across stakeholder groups. Respondents identified reduced stigma as a facilitator for increasing treatment enrollment and support to address SUD issues. Respondents discussed a general reduction in stigma, but frequently highlighted changes in stigma stemming from increased community support for treatment and recovery and changing attitudes within the criminal justice system.

Community Support. When discussing the observed declines in mortality, a respondent from the economic development sector noted, "[Substance use] is getting talked about a lot more, not kept underground anymore. Some people aren't as ashamed as they used to be to get into recovery and get help." In the late 2000s and early 2010s, overdose mortality and issues concerning substance use were sources of embarrassment; however, as substance use became more widespread, community members started to recognize these issues as ubiquitous instead of

isolated. A health care representative illustrated this point: "Everyone knows someone in their family that has some kind of substance abuse—I think people realize it can happen to them, it is on their back door."

Criminal Justice. Respondents shared that reduced stigma within the criminal justice system has led to increased treatment enrollment and decreased incarceration rates. When asked about the facilitators to treatment enrollment, a criminal justice representative explained, "The issue got so bad it was difficult to find someone who hasn't had an experience in their personal life." They noted that the increase in broader community support also contributed to a reduction in stigma throughout the criminal justice system.

Another criminal justice sector respondent discussed how the criminal justice system initially tried to use incarceration as a way to solve the addiction problem, and realized this course of action was not effective. They explained how the courts started to use treatment and rehab programs as an alternative to incarceration and outlined the positive impact of this altered approach:[23] "People know what they are talking about because they see the results, they see the people who remain sober, got their kids back."

III. Shifts in Drug Use Patterns

While respondents discussed many of the positive reasons they believed Eastern Kentucky saw a decline in drug overdose mortality rates, they also frequently mentioned shifting drug use patterns in the region. Across all sector types, interview respondents described the increased use of methamphetamines, in particular, as a primary contributing factor to reduced opioid mortality rates as access to prescription opioids declined. Treatment providers reported that a higher percentage of their clients indicated that methamphetamine was their primary drug of choice. For example, ARC stated that 6 percent of their clients reported methamphetamine as their drug of choice in 2014, compared to 27 percent in 2017, and over 40 percent currently (as of April 2020). Similarly, a representative from the recovery sector stated, "Our drug of choice in recovery centers is meth. Not that we don't see opiates, but the trends have gone down significantly. The drug of choice statewide is meth. It used to be only in western Kentucky, but now it is in Eastern Kentucky." Additionally, some respondents in the region reported that there was not a dramatic shift in Eastern Kentucky to heroin use when the supply of prescription opioids declined, because heroin was not readily available, as it was in other parts of the state. This may have also been a contributing factor to the declining rates of drug overdose mortality.

There were differences in opinion about when the rise in use of methamphetamine began, which may have been influenced by different trends across the region. Some respondents reported that the rise in methamphetamine was more recent, within the past few years, while others believed

the increase in Eastern Kentucky began when the access to prescription opioids was limited. The source of methamphetamine has also changed over the past 10 years. One representative from law enforcement described that the methamphetamine "used to be home cooked, but is available now from Mexican drug trafficking organizations. [They are] seeing more and more meth than we saw 10 to 12 years ago" in terms of seizures. While the methamphetamine supply chain shifted, the cost also declined: "The cost of methamphetamine has gone down, which tells me the supply is meeting the demand." The imported methamphetamine is easier for people who use it to obtain, since they do not have to cook it themselves, cheaper, and more potent than home-cooked methamphetamine.[24]

The reason that the shift in drug use from opioids to methamphetamine contributed to the decline in drug overdose mortality was that methamphetamine use alone does not often lead to acute fatal overdose; however, many other negative health and social consequences are associated with methamphetamine use. As one respondent said, "The difference in meth is it is not a drug that will take a person's life, it just makes them crazy." Another respondent said, "With meth, you don't see the acute overdoses as often as you do with opiates. It's just as devastating, but it doesn't have [a] sedative effect." Respondents also described the longer-term impacts of sustained methamphetamine use, including "30-year-olds blowing heart valves." A representative from the treatment sector stated, "Meth kills you slower. You are still going to die from it eventually, but it doesn't cause the levels of respiratory arrest."

Law enforcement professionals described that with methamphetamine, "You get more violent people, more drug-induced psychosis. There is a lot of paranoia, and they are more likely to fight. They carry guns. Didn't see that as much with opioids." While it may not lead to a fatality that is reported as a drug overdose, respondents noted that methamphetamine contributes to mortality rates in many indirect ways, in addition to other many health and social consequences.[25] Additionally, some representatives from the treatment sector said that people do not seek treatment for methamphetamine as often as for opioids. Additionally, there are not MAT options for methamphetamine use, like there are for opioid use, which makes treatment more difficult and the long-term success rate lower.

IV. Impact of COVID-19 Pandemic

Data collection for this project occurred during the early phases of the COVID-19 pandemic, and some respondents reflected on the impacts of the COVID-19 pandemic on substance use treatment and drug overdose prevention. For example, a few respondents noted that individuals released from jail as a result of the pandemic may have been at higher risk of overdose if they were not provided appropriate support services and resources. Some respondents conveyed anecdotal observations regarding spikes in overdoses occurring after measures to mitigate the

spread of coronavirus were implemented. Respondents noted that COVID-19 has impacted the services provided by treatment centers, in-person recovery and support communities, and the overall economic environment of these communities. One respondent noted that a positive consequence of the COVID-19 response has been the increased focus on telehealth among the treatment community. However, the dramatic rise in unemployment and social isolation resulting from shutdowns remain a significant concern for individuals with and people working to address SUD.

Limitations

We recognize several limitations associated with this study. First, study findings were based on the thoughts and opinions of local and state stakeholders within Kentucky. While researchers have worked to identify consistent themes across respondents, data may not be generalizable to other settings. Second, the complex nature and multiple factors influencing shifts and declines in drug overdose mortality made it difficult to assess the relative importance of various factors contributing to observed declines. Because this was a qualitative study, it was impossible to ascertain which components of the holistic approach to prevention had the greatest impact on the declines in drug overdose mortality. Third, due to COVID-19 social distancing guidelines, we could not travel to the region to collect data in-person as we originally planned, which may have changed conversation dynamics and influenced final data collection.

Implications

Eastern Kentucky achieved notable success in reducing drug overdose mortality, and this study highlighted some of the strategies that key informants believed were successful in reducing overdose mortality, which may be adapted and leveraged by other states and communities. Respondents discussed how the region's longstanding focus and commitment from partners, stakeholders, and policymakers to address SUD has led to positive outcomes, including declines in mortality, increased access to treatment, and reduced stigma. Kentucky has enacted many policies to improve prescribing behaviors. Additionally, Medicaid expansion and additional substance use treatment benefits led to a dramatic increase in the availability of treatment options in Eastern Kentucky, which respondents noted likely contributed to declines in drug overdose mortality. Eastern Kentucky also focused on creating an environment that promoted long-term recovery for people with SUD, for example, increasing access to recovery housing and advocating for second chance employment opportunities. Respondents discussed the impact of reduced stigma, specifically among the police, judicial system, employers, and the broader community. Respondents noted other factors that may have contributed to declines in drug overdose mortality, including increased access to naloxone and education and prevention efforts.

In addition to these positive factors, respondents discussed the shift in drug use patterns—specifically to an increased use of methamphetamine—as one of the major contributing factors to the declines in drug overdose mortality. Because methamphetamine is less likely than opioids to cause acute fatal overdose, a shift to more use of methamphetamine could lead to a decline in drug overdose mortality, but may not indicate a decline in substance use within the region. There were significant concerns associated with the increase in methamphetamine use, including longer-term health impacts, increased violence perpetration among individuals using methamphetamine and increased crime within the community, and lower success rates for treatment. One respondent pointed out that until underlying substance use issues are addressed, substances will be substituted and shift as the supply of substances changes. Considerations for how resources and funding may address all SUD, not solely opioid use disorder, may be beneficial as methamphetamine use continues to rise across the country.

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